Hammill Institute on Disabilities

Topics in Early Childhood Special Education
2022, Vol. 42(3) 246–258

DOI: 10.1177/02711214221117087
tecse.sagepub.com
SAGE

Incorporating Video Feedback Within a Parent-Implemented Naturalistic Developmental Behavioral Intervention Package Via Telepractice

Ciara L. Ousley, PhD, BCBA-D[1], Tracy J. Raulston, PhD, BCBA-D[2], and Christina S. Gilhuber, MS[3]

Abstract

Delays in communication are commonly experienced by young children who are not meeting developmental milestones. Early naturalistic developmental behavioral interventions are efficacious, and parents can successfully embed these communication strategies into playtime routines, including when coaching is delivered via telepractice. Video feedback is a strength-based coaching method that has been successfully applied to increase positive parenting behaviors (e.g., descriptive praise, responsivity). However, limited research exists on the use of video feedback as a coaching tool for parents of children with developmental delays for communication interventions. We evaluated the effects of a telepractice-based parent training followed by joint reflections and video feedback coaching on parent strategy use and child communication targets, using a concurrent multiple-baseline across three parent–child dyads design. Parent perceptions of the feasibility and appropriateness of the intervention were positive. We discuss implications and provide suggestions for future research and practice.

Keywords

video feedback, telepractice, communication delay, parent coaching

The most common deficit for young children not meeting developmental milestones are communication delays (U.S. Department of Education, 2020). Delays in communication are an early indicator of cognitive and developmental impairments, with continued delays often resulting in the establishment and escalation of challenging behavior (Machalicek, Raulston, et al., 2016), poor social skills (Kopp et al., 1992), lack of reciprocal friendships (Kasari et al., 2011), and adverse effects on academic performance (Lang et al., 2016). Early interventions that target pivotal communication skills can result in great improvements in cognitive development (McIntyre et al. 2021; Wallander et al., 2014) and spoken language (Fuller & Kaiser, 2020; Hampton & Kaiser, 2016), therefore resulting in more inclusive school placements (Harris & Handleman, 2000), especially when families serve as the interventionist (Hume et al., 2021). Therefore, we evaluated the effects of a telepractice-based parent-implemented intervention package (i.e., an initial 1-hour parent training following by joint reflections and video feedback coaching) on parent strategy use and child social communication.

Family Involvement in Early Interventions

Best practice indicates that early interventions should be delivered as quickly as possible (i.e., as soon as a delay is suspected) and involve family-centered approaches. Family-centered care involves empowering families to implement evidence-based strategies in their naturally occurring routines (Division for Early Childhood [DEC], 2014; National Research Council, 2001; Roberts & Kaiser, 2015; Ruppert et al., 2016). Building the family's capacity to embed strategies within everyday routines maximizes a child's learning opportunities during a crucial time of

[1]The University of Nebraska–Lincoln, Lincoln, NE, USA
[2]Action Behavior Centers—Four Points, Austin, TX, USA
[3]The Pennsylvania State University — University Park, State College, PA USA

Corresponding Author:
Ciara L. Ousley, Department of Special Education and Communication Disorders, The University of Nebraska–Lincoln, 301 Barkley Memorial Center, PO Box 830738, Lincoln, NE 68583, USA.
Email: ciara.ousley19@gmail.com

development and neural plasticity (Bolton & Hattie, 2017; Bronfenbrenner, 1979; Hume et al., 2021; Vandervert, 2017). Because young children learn through play, their caregivers are ideally situated to scaffold supports for communication during developmentally appropriate and motivating play routines, such as playing with toys at home, visiting neighborhood parks and playgrounds, and attending playdates with friends (Barton & Wolery, 2008; Bruinsma et al., 2020; DEC, 2014; Raulston et al., 2020, 2021; Vygotsky, 1978).

Naturalistic Developmental Behavioral Interventions

Naturalistic developmental behavioral interventions (NDBIs) are treatment approaches with theoretical underpinnings in both behavioral and developmental theories of learning and development (Bruinsma et al., 2020; Schreibman et al., 2015). NDBIs involve the use of applied behavior analytic principles (e.g., antecedent manipulation and natural reinforcement) to teach skills chosen from a developmental sequence in natural environments (Schreibman et al., 2015). NDBIs are often delivered during playtime routines and target various developmental behaviors (e.g., social communication). NDBIs have been incorporated with children with autism spectrum disorder (ASD) and intellectual disabilities (Akemoglu et al., 2020; McIntyre et al., 2021). According to Bruinsma et al. (2020), a few commonly used NDBI strategies are *modeling language* (i.e., adult demonstrates how to use language at or just above the child's level); *following and imitating the child's play* (i.e., child initiates play and adult plays in a similar manner); *environmental arrangement* (i.e., adult structures play activity to encourage child to request an item or action); and *natural reinforcement* (i.e., providing the child with motivating consequences to increase the future likelihood of the behavior). For example, while interacting with a ball, a parent may model developmentally appropriate language (e.g., saying "ball" as opposed to a complex sentence) and provide natural reinforcement after child communications (e. g., rolling the ball to the child after they say, "ball"). When parents implement NDBI strategies proficiently and regularly, improvement in child communication, language, joint attention, and play skills are often achieved (Hampton et al., 2021; Rakap & Rakap, 2014; Roberts & Kaiser, 2015).

Training and Coaching Parents Via Telepractice

Families of children with communication delays may face several barriers to accessing adequate early interventions. For instance, there is an overall shortage of early intervention practitioners, resulting in many children not receiving early intervention services (Hebbler et al., 2007; McIntyre & Zemantic, 2017). Additionally, parents have reported difficulties associated with the financial constraints of costly in-person therapies (Raulston et al., 2019). Third, families residing in rural areas often live far from clinics, which poses additional challenges with participation (Machalicek, Lequia, et al., 2016). Creative avenues for training and coaching parents online have recently been described within the literature (Machalicek et al., 2015; Meadan et al., 2016; Raulston et al., 2019).

Telepractice services are those that occur remotely via a secure, online platform (Simacek et al., 2021). Parents of children with developmental delays and disabilities have been successfully trained and coached via telepractice to implement strategies to support their child's communication skills (Akemoglu et al., 2020). For example, Meadan et al. (2016) used an online platform to train and coach three parents to (a) model language, (b) prompt their child to communicate a want or need (i.e., ask a question, provide a choice, or request a response), and (c) provide wait time with an expectant look. Parents successfully used communication-based strategies during interactions with their child with fidelity when parents received follow-up coaching.

Importance of Performance Feedback

Parent coaching practices in early intervention are complex, multi-component processes that vary across different approaches (Romano & Schurr, 2022; Snyder et al., 2015). For example, coaching practices may include (a) written and verbal instructions, (b) modeling (e.g., an early interventionist demonstrates the use of language modeling), and/or (c) role-play, scenario-based discussion or practice using the skill. However, all parent coaching practices incorporate performance feedback (Bruinsma et al., 2020; Ruppert et al., 2016).

Performance feedback may consist of (a) praise (e.g., "You gave her the train track right after she pointed to it. That was a great use of natural reinforcement!"); (b) correction (e.g., "She pointed to the train. Rather than continuing to play with the dollhouse, follow her lead to the train set."); (c) using supportive methods to encourage parents to self-reflect (e.g., "What language could you model when playing with the train?"); and (d) engaging in joint or guided reflections (e.g., "How do you think you did?"; Bruinsma et al., 2020; Larson et al., 1984). Performance feedback is a critical active ingredient in coaching interventions and has been used to promote child development more broadly (Friedman et al., 2012). Without feedback, individuals may continue to repeat errors or miss out on opportunities to implement strategies (Akemoglu et al., 2020; Barton et al., 2013; Coogle et al., 2020; Meadan et al., 2016). However, providing synchronous feedback via telepractice (i.e.,

providing coaching in-the-moment while parents and their children are playing; Simacek et al., 2021) can be challenging for an early intervention coach. For example, the interaction between the parent and child may be so fast paced that the learning opportunity passes before the coach can provide feedback. Researchers have recently used video during live parent coaching sessions to guide their feedback on caregivers performance of newly learned skills.

Video Feedback Coaching

Video feedback coaching is a strength-based approach that follows Bandura's Social Learning Theory (Bandura, 1986) and accentuates a parent's role during interactions with their child. First introduced to improve parent–child interactions in the 1970's (Stern, 1971), video feedback coaching involves a parent and a coach viewing a pre-recorded interaction between the parent and child together (Balldin et al., 2018). Fuller and Manning (1973) argued that parents are more likely to devote attention to video coaching when the "positive model," or person performing a skill accurately, in the recording is themselves as opposed to viewing an expert flawlessly employing strategies with an unknown child. While viewing the video, the coach may pause or replay segments of the interaction to highlight positive interactions and reflect upon missed opportunities. Video feedback coaching has been successfully used to increase positive parenting behaviors (e.g., descriptive praise, responsivity) and decrease maladaptive parenting behaviors, such as intrusiveness during play interactions (Phaneuf & McIntyre, 2007). In fact, researchers have recently suggested using videos to support changes in practice and bridge the research to practice gap on caregiver coaching strategies (Romano & Schnurr, 2022).

Few studies have evaluated video feedback as a coaching tool for communication-based parent-implemented NDBIs despite the strong theoretical (Bandura, 1986; Vygotsky, 1978) and empirical (Balldin et al., 2018) support on the effectiveness of video feedback coaching for parents. For example, Ence (2012) utilized video feedback to coach three parents (one father and two mothers) who were struggling to implement pivotal response treatment, a NDBI, with high levels of fidelity after other coaching methods. Findings suggested that video feedback was a successful coaching method for each parent, and the three children, all of whom were on the autism spectrum, increased their functional communication. Video feedback coaching was administered in-person as opposed to telepractice. However, more recently, Wattanawongwan et al. (2020) delivered video feedback on NDBI strategies for 1-hour each week to parents of children with ASD via telepractice. Similar to Ence (2012), parental strategy use and child social communication increased. Because the intervention was a part of a multi-component coaching package (e.g., written feedback, role plays), the effects of video feedback were not isolated. Given the aforementioned empirical studies, additional research is warranted to understand (a) the effectiveness of video feedback coaching on parent-implemented NDBIs when delivered via telepractice and (b) the impact video feedback interventions have on the social communication of children with disabilities other than ASD.

The Current Study

In the current study, we extended the use of video feedback within telepractice to parent-implemented NDBIs for families of young children with communication delays. Specifically, we sought to investigate the following research questions:

- **RQ1.** Is there a functional relation between a telepractice-based parent-implemented intervention (an initial training followed by joint reflections and video feedback coaching) and implementation of NDBI strategies during playtime routines?
- **RQ2.** Is there a functional relation between a telepractice-based parent-implemented intervention (an initial training followed by joint reflections and video feedback coaching) and child communication targets?
- **RQ3.** How do parents rate the social validity of the parent-implemented NDBI strategies, joint reflections, and video feedback coaching?

Method

We employed a concurrent multiple-baseline single case design across three parent–child dyads to evaluate the effects of a parent-implemented NDBI package (i.e., initial training with follow-up joint reflections and video feedback coaching) on parent implementation of five NDBI strategies (i.e., Model Language, Arrange Environment, Follow and Imitate, Wait Time, and Reward and Expand) and child communication. Parents received an initial introduction to the five key strategies during training via telepractice followed by 4 to 6 weeks of coaching using joint reflections (occurring each session after playing, reflecting upon that session's interaction) and video feedback (occurring before each play session and updated each week).

Participants and Setting

Parent–child dyads were recruited via social media platforms (e.g., parent support groups on Facebook) in November 2020 after approval from the university's review board. Parents had to reside in the United States of America with their child, be at least 18 years of age or older, and be able to regularly meet with the first author on an online

Table 1. Child Assessment Results.

	VABS-3					
Assessment	Adaptive behavior composite score	Communication standard score	Receptive communication age equivalence	Expressive communication age equivalence	MCDI-III raw score	Preference assessment
Johnny	71 (*SD* = −2)	56 (*SD* = −3)	1 year 6 months	1 year 11 months	23 words	Figurines of cartoons House/school sets Airport tower set
Cece	68 (*SD* = −2)	58 (*SD* = −3)	0 years 11 months	0 years 11 months	0 words	Singing and dancing Books Slide
Ron	93 (*SD* = −0.5)	85 (*SD* = −1)	1 year 8 months	1 year 5 months	0 words	Toy cars and track Sensory bins (e.g., rice) Marble tower

Note. VABS-3 = Vineland Adaptive Behavior Scale–Third Edition; MCDI-III = MacArthur-Bates Communicative Development Inventory-III.

conferencing platform (i.e., Zoom) to qualify. Additional inclusion criteria for the parent were (a) being able to speak and understand English, (b) having access to the Internet and an electronic device with a camera that could connect to a video conferencing platform, and (c) being the primary caregiver of a child with a communication delay that qualified for the study. To be eligible, children had to (a) be between the age of 2 and 5 years old; (b) have a documented educational eligibility or medical diagnosis that qualified them for early intervention, special education, or speech services, per parent report; and (c) have a communication delay. Communication delays were defined as falling at least one standard deviation below the mean on the communication domain of the Vineland Adaptive Behavior Scale–Third Edition (VABS-3). The VABS-3 assessment is a normed-referenced and valid assessment with excellent internal consistency (range 0.94–0.99) and test–retest reliability (range 0.64–0.94; Pepperdine & McCrimmon, 2018). In addition, children had to be able to follow a simple instruction and have normal hearing (with or without hearing aids/assistance). Five parents of children with communication delays contacted the first author via e-mail or social media messaging. One parent did not return the first author's follow-up outreach, and another parent did not qualify due to the child's advanced communication skills (i.e., spoke in complete sentences). Therefore, three dyads qualified.

Screening and assessment. The first author met with parents twice for 1 hour each to (a) consent (parent) and assent (child) to the study; (b) participate in interviews to complete the VABS-3 and MacArthur-Bates Communicative Development Inventory-III (MCDI-III; internal consistency range 0.95–0.96; test–retest reliability range .80–.90; Fenson et al., 1993); and (c) determine pre-existing motivating routines or play-activities though an indirect preference assessment prior to beginning baseline. The first author provided the parent with a list of different toys (e.g., figurines, cars) and play activities (e.g., reading, blowing bubbles) for the indirect preference assessment. She asked the parents to rate how much their child enjoyed the toy or play activity on a Likert scale. Parents were provided with an opportunity to list other activities not listed (e.g., a ball pit). See Table 1 for assessment results.

Dyad 1: Rose and Johnny. Rose and Johnny resided in a rural area within the Mid-Atlantic portion of the United States. Rose was a White 39-year-old married to Johnny's father, and the household had an annual household income above $90,000. All sessions occurred remotely, with Rose and Johnny being at a table within their home setting. Johnny was 5 years and 2 months old at the beginning of the study and had a medical diagnosis of ASD reported by his mother (severe range according to the Childhood Autism Rating Scale-2). He received his ASD diagnosis at 3 years of age by a psychiatrist. Johnny attended a local special education preschool classroom where he received speech and occupational therapy special education services under the diagnosis of ASD. Rose reported that Johnny was on a waitlist for additional services (i.e., outside of school), including a psychiatrist for anxiety. Johnny communicated with vocal speech and primarily spoke using one- to two-word combinations, frequently engaging in repeated words or phrases. The parent–child dyad enjoyed playing with figurines from television shows and movies as well as toy sets (e.g., house, school, camping), according to the preference assessment.

Dyad 2: Pam and Cece. Pam (White 32-year-old) and Cece lived with Jim (Cece's father and Pam's husband) in a suburb of a large city in the Northeastern area of the United States. Their annual household income was above $90,000.

Jim completed the assessments, and Pam implemented the intervention. All sessions occurred remotely within their home. Cece was 2 years and 2 months old at the start of the study and had a medical diagnosis of Williams syndrome, which she received from a geneticist. She received occupational therapy and speech services through Part C Early Intervention. Cece primarily communicated with vocalizations and gestures (e.g., holding her mother's hand and navigating her to a desired toy or activity). She said a total of two word approximations (i.e., /g/ for "go" and /uh/ for "up") at the start of the study. Jim reported that Cece's word approximations recently decreased, as Cece had previously used at least four other word approximations. The parent–child dyad enjoyed dancing to music, reading books, and playing on a slide inside their home, according to the preference assessment.

Dyad 3: Leslie and Ron. Leslie and Ron resided with Leslie's mother (Ron's grandmother) in a rural Midwestern section of the United States. Leslie was a White 29-year-old. The annual household income was between $40,000 and $49,999. All sessions occurred remotely within Leslie and Ron's living room. Ron was 2 years old at the beginning of the study. Leslie reported that Ron qualified for Part C Early Intervention services due to a developmental delay in the area of communication. Ron was receiving speech therapy through Part C and previously received speech therapy from a local university. He communicated primarily with his unintelligible vocal speech and used approximately six intelligible words (e.g., mom, nana). Ron also used some manual signs (e.g., drink). The parent–child dyad enjoyed playing with sensory items (e.g., kinetic sand, rice inside of a bin) and toy vehicles and figurines, according to the preference assessment.

Materials

All screening, baseline, training, intervention, and social validity meetings occurred via Zoom using personal technology that was owned by the parents prior to the study (i.e., phones, tablet, and computer). All meetings except for screening assessments were video and audio recorded. All data and videos were securely stored on an online-based storage cloud. The first author used *PowerPoint* to create a training on five strategies (i.e., Model Language, Follow and Imitate Child, Arrange Environment, Wait, and Reward and Expand Communication) and *iMovie* (version 10.1.12) for video feedback coaching. All play activities were toys and activities that were already within the dyads home setting.

Procedures

Experimental design. We employed a concurrent single-case multiple baseline across parent–child dyads design. The primary dependent variable was parent implementation of strategies, and the secondary dependent variable was child communication. Decisions regarding phase changes were response-guided and based upon horizontal and vertical visual analysis of parent behavior (e.g., level changes, trend of data, and variability of data).

Dependent measures: Parent strategy use and child communication. Parent data on strategy use were collected using 10-second partial-interval recording for the duration of each 10-minute session. If interactions between the parent and child were silenced due to automatic settings on Zoom, no data were collected. In other words, only communication or strategies that were captured via video and audio were counted. Parent data were collected across all five strategies, as well as the percentage of intervals with total strategy use (i.e., parent implemented at least one strategy within the interval). The latter of the two (i.e., total strategy use) was graphed for visual analysis. A specific sequence of parent strategy use was not required and missed opportunities were not analyzed. Frequency of child communication data on single utterance (i.e., Cece and Ron), gesture (i.e., Cece), or multi-word utterances (i.e., Jonny) were collected using time-stamped data. If a child repeated the communication, the communication attempts were counted as one single occurrence unless (a) the parent expanded the communication between the utterances or gestures or (b) 10 seconds had passed between communication attempts. The one exception to this was Johnny, as any repeated utterances were not counted due to the frequency of the child's echoic speech. Child communication data were individualized and collected for the duration of the 10-minute play session.

Baseline. Ten-minute sessions were conducted one to two times per week via Zoom. The first author video recorded the sessions and (a) verified the dyad was within the video frame and that their audio was working, (b) requested the parent try and keep their child within the video frame for the duration of the 10-minute session, (c) reminded the parent to engage in any of the play activities identified through the preference assessment, and (d) asked the parents if there were any questions. The first author turned off her video camera and muted herself while the parent and child played. The first author unmuted herself and turned on her camera at the end of the 10-minute timer. No feedback or coaching was provided.

Training. The first author served as the parent trainer and coach for all three dyads. She was a doctoral candidate in special education and a former early childhood special education teacher with 7 years of experience working with children with developmental disabilities. This was her first attempt at training and coaching parents via telepractice. She completed a portion of board certified behavior analyst supervision hours during the current study and was supervised by the second author. The first author will be referred to as the coach henceforth.

Table 2. Strategy Descriptions and Examples.

Strategy	Definition	Example
Follow and imitate the child's play	Focusing on toys or activities that are of interest to the child and mirroring the child's play	If child drops marbles down a tower, the parent drops a marble down too.
Model language at the child's communication level	Vocalizing vocabulary or demonstrating gesturing related to the toys or activities at child's communication level	Parent vocally says, "down!" as they drop a marble down the marble tower.
Arrange environment	Modifying items during play (e.g., people, toys) that requires communication to access the item	After the marble rolls down the tower, the parent takes it from the bottom and holds it within sight, but out of reach from the child.
Wait at least 3 seconds	Looking expectantly (e.g., eyebrows raised, arms/hands up) at child and waiting 3 seconds—this tends to occur following *model language* or *arrange environment.*	While holding the marble, the parent looks expectantly at the child and waits 3 to 5 seconds for the child use a word approximation.
Reward 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, expanding it one step-above the child's communication level.	Once child uses a word approximation (e.g., "ow" the parent immediately rolls the marble down the tower and says "down!"

Note. Examples are based upon a play scenario with a marble tower set. The child's communication goal for this example is to vocally say at least one phoneme of the word *down* correctly.

The parent (i.e., Dyads 1 and 3) or parents (i.e., Dyad 2) met with the coach on a video conference call for 1 to 1½ hours for training between the final baseline probe and first intervention probe. Training, example videos, and visuals were developed using resources within Ingersoll and Dvortcsak (2019) as a guide. The coach sent the parents a copy of a visual representation of each of the strategies (see online supplemental materials Figure 1). The five strategies were: Model Language, Arrange Environment, Follow & Imitate Child's Play, Wait, *and* Reward & Expand Child Communication. During training, the coach (a) reviewed the importance of targeting communication during playtime; (b) analyzed an interaction that occurred between the parent and child during baseline by playing a short video clip; and (c) demonstrated how interactions are encouraged by antecedents (i.e., events occurring immediately before communication) and consequences (i.e., events occurring immediately after communication). Then, the parents and coach collaboratively developed child communication goals (Bruinsma et al., 2020; DEC, 2014). The coach proposed a developmentally appropriate communication goal that corresponded with each child's VABS-3 assessment. From there, the coach and the parent conspired to create individually based details (e.g., appropriate gestures, words to target). See Supplemental Table 1 for the operational definitions and examples of child communication goals. Once the goal was developed, the coach described each strategy individually and provided one example of how the parent could incorporate the strategy during their child's play sessions. Then, parent and coach collaboratively brainstormed two additional examples. This process was repeated for each of the five strategies. See Table 2 for descriptions and examples of each strategy. Then, the parent and coach engaged in a scenario-based discussion. For example, during the training Rose had one of the toys identified via the preference assessment (i.e., a toy house with Peppa Pig figures). The coach verbally described a parent–child play interaction that had occurred in a baseline session, utilizing strength-focused verbal feedback (Bruinsma et al., 2020; DEC, 2014) to guide the scenario-based discussion. The coach said, "So, now let's pretend that I am Johnny, and I bounce the pig toy up and down. What would you do?" Then, Rose described and modeled what strategy she would implement in that scenario (e.g., imitate Johnny by bouncing another toy figurine). Then, the coach provided verbal praise (e.g., "Excellent! Following and imitating his play will keep him engaged. What is one other strategy that you could also apply here?"). The parent then selected another appropriate strategy (e.g., modeling language at the child's level; saying "Peppa jumps!"). The coach continued to provide strength-based feedback until parents expressed confidence in understanding and applying all five strategies (Bruinsma et al., 2020; DEC, 2014). The coach sent a follow-up e-mail that included the list of examples on how to use each strategy and a $25 Amazon gift certificate as an honorarium for completing baseline after training ended.

Video feedback coaching. Procedures during intervention mirrored baseline except the parent and coach (a) began the session by reviewing the strategies and individualized video feedback from the previous week's sessions via the coach sharing her computer screen and (b) ended the session by reflecting on that day's interaction. New video feedback was developed each week of intervention. Video feedback

included three short video clips demonstrating how the parent successfully incorporated several strategies in the previous week (e.g., Model Language *and* Wait Time) and one short video clip emphasizing one strategy to focus on for the week. All five strategies were included in the video feedback each week. The coach used clinical judgment to identify the strategy where there were the most missed opportunities, as data were not collected on missed opportunities within each session. Parents were coached on a different strategy each week (i.e., the same strategy was not selected in consecutive weeks). The one exception to this was in the final week of each dyad's intervention, where video feedback included three videos of positive demonstrations of the strategies, and the final video that emphasized an area of focus encouraged parents to continue using all the strategies as opposed to just one. Parents were not informed that the strategy was selected due to there being several missed opportunities.

The coach uploaded the Zoom recordings from the previous week onto iMovie (version 10.1.12) using her MacBook laptop to create the video feedback. Then, she trimmed portions of the videos to only be those within the 10-minute play session (i.e., greetings and self-reflections were trimmed out). Next, the coach watched both videos and created notes of (a) positive examples and (b) missed opportunities of the parent incorporating strategies and the child communicating. The coach noted which strategy had the most missed opportunities and an interaction that included the parent positively performing that strategy. Finally, the coach selected and trimmed the larger videos into four interactions that either (a) highlighted the parent incorporating at least three strategies or included the child accomplishing their communication goals and included at least two strategies from the parent, or (b) demonstrated the positive effects of the parent incorporating the strategy noted by the coach with the most missed opportunities. Titles (e.g., "Example 1") and a visual highlighting the strategies used preceded each shortened video clip. Transitions and subtitles (e.g., "Model Language") were added between and within each video, respectively. The average duration of the video feedback (including the four videos, titles, and transitions) was 3 minutes and 10 seconds (range 2 minutes and 10 seconds–4 minutes and 17 seconds. See Figure 1 for a screenshot of video feedback.

Joint reflections. Joint reflections at the end of the 10-minute interaction included (a) asking the parent how they thought the session went, (b) answering any questions the parents asked, (c) praising the parent's strategy use, and (d) highlighting one positive example of the parent attempting to incorporate at least three of the strategies. Corrective feedback was not provided unless it was provoked by a parent question. No additional coaching was provided, and parents did not receive feedback on their use of a strategy until the beginning of the next session. Parents were provided an additional $25 Amazon gift certificate as honorarium at the conclusion of the final intervention session.

Figure 1. Screenshot of video feedback coaching.
Note. The above photograph is an example of video feedback with strength-based textual feedback. Textual feedback (i.e., naming the strategy used) was embedded within the video clip to highlight the parent strategy use. Image: © vologymry/stock.adobe.com. Used under the terms of the standard license.

Social validity interviews. All three parents completed a social validity interview following the Treatment and Acceptability Rating Form-Revised (TARF-R; Reimers et al., 1991) at the conclusion of the intervention. There were 23 questions regarding the intervention. Twenty-two were Likert-scale questions (scale of 1–5) while one was open-ended. The third author, a doctoral candidate who was not involved with the intervention, conducted the interview to avoid bias. Interviews occurred and were recorded via Zoom. Each interview lasted between 9 and 21 minutes. The first author assessed procedural fidelity for all social validity interviews, and all social validity interviews were implemented with 100% accuracy.

Procedural fidelity. Task analyses were developed to assess the fidelity of the procedures for baseline (8 steps), training (16 steps), and video feedback coaching (15 steps). The third author assessed fidelity for all parent trainings ($n = 3$) and at least 20% of baseline and intervention sessions for each dyad. Sessions were randomly selected using a random number generator. Fidelity for baseline sessions was 100% for all three parent–child dyads. Fidelity training and coaching was 100%.

Interobserver agreement. The first author trained the third author to perform interval-by-interval (parent) and time-stamped (i.e., within 3-seconds) frequency (child)

Table 3. Means and Ranges of the Percentage of Intervals Each Strategy was Used.

	Strategy				
	Follow and imitate	Arrange environment	Model language	Wait time	Reward and expand
Rose (Dyad 1)					
Baseline					
M (range)	8% (3%–13%)	2% (0%–3%)	7% (3%–10%)	0% NA	10% (2%–22%)
Intervention					
M (range)	27% (18%–42%)	3% (0%–8%)	35% (8%–47%)	2% (0%–3%)	27% (17%–37%)
Pam (Dyad 2)					
Baseline					
M (range)	4% (2%–15%)	2% (0%–15%)	9% (3%–28%)	1% (0%–7%)	3% (0%–7%)
Intervention					
M (range)	29% (3%–50%)	6% (0%–12%)	25% (13%–40%)	13% (0%–33%)	14% (7%–22%)
Leslie (Dyad 3)					
Baseline					
M (range)	4% (0%–13%)	2% (0%–12%)	21% (7%–33%)	1% (0%–7%)	7% (2%–17%)
Intervention					
M (range)	24% (2%–47%)	14% (2%–40%)	49% (40%–60%)	6% (2%–13%)	18% (8%–33%)

Note. NA = not applicable.

interobserver agreement (IOA) for each parent–child dyad. The first author (a) taught the third author each of the five strategies, (b) modeled how to code each video, and (c) practiced how to code a video with the third author. Once the two authors demonstrated 90% agreement for both parent and child behavior on two independently coded videos, IOA began on randomly selected videos. If agreement ever fell below 80%, the first author trained the third author by coding a video together as a booster session. IOA was calculated by dividing the total number of agreements by the sum of agreements and disagreements and multiplying by 100 to yield a percentage.

Average IOA was above 80% agreement for all dyads and phases. IOA was assessed for 33% of baseline sessions and 22% of intervention sessions for Dyad 1. Average agreement for parent data was 83% for baseline (range 78%–87%) and 88% for intervention sessions (range 85%–90%). Average agreement for child data was 93% for baseline (range 92%–93%) and 93% for intervention (range 85%–100%). For Dyad 2, 25% of baseline sessions and 27% of intervention sessions were assessed. Mean agreement for parent data was 99% for baseline (range 98%–100%) and 92% for intervention (range 88%–95%). Overall IOA for child data was 93% for baseline (range 80%–100%) and 87% for intervention (range 78%–91%). IOA for Dyad 3 was assessed for 25% of baseline and 25% of intervention sessions, with 96% agreement on baseline sessions (range 95%–97%) and 94% agreement for intervention sessions (range 90%–98%) for parent strategy use. Agreement for child data was 98% for baseline (range 94%–100%) and 82% for intervention (range 78%–85%).

Results

During intervention, strategy usage (both total strategy usage and individual strategy usage) increased for all parents. See Table 3 for the means and ranges for each individual strategy in baseline and intervention. Child communication increased for all tiers. See Figure 2 for a graphical representation of total parent strategy use and child communication data.

Visual analyses of parent strategy use indicate three demonstrations of basic effects, suggesting a functional relation (i.e., experimental control) between the intervention package and parent strategy use. Frequency of child communication increased following joint reflections and video feedback coaching, most notably for Cece and Ron. Visual inspection of child communication data indicates two demonstrations of basic effects (i.e., not Johnny), suggesting no functional relation between the intervention and child communication.

Parent Strategy Use and Child Communication

Dyad 1: Rose and Johnny. Prior to training and video feedback, Rose's total strategy use had mild variability. Parent data initially decreased before slightly increasing over time (range 12%–32%). Johnny's phrases containing combinations of a noun with a verb and/or an adjective had moderate variability in baseline (range 5–21). Child communication initially increased, followed by a rapid decrease and a steady increase prior to intervention.

After training, Rose's total strategy use immediately increased in level with limited variability and no overlapping

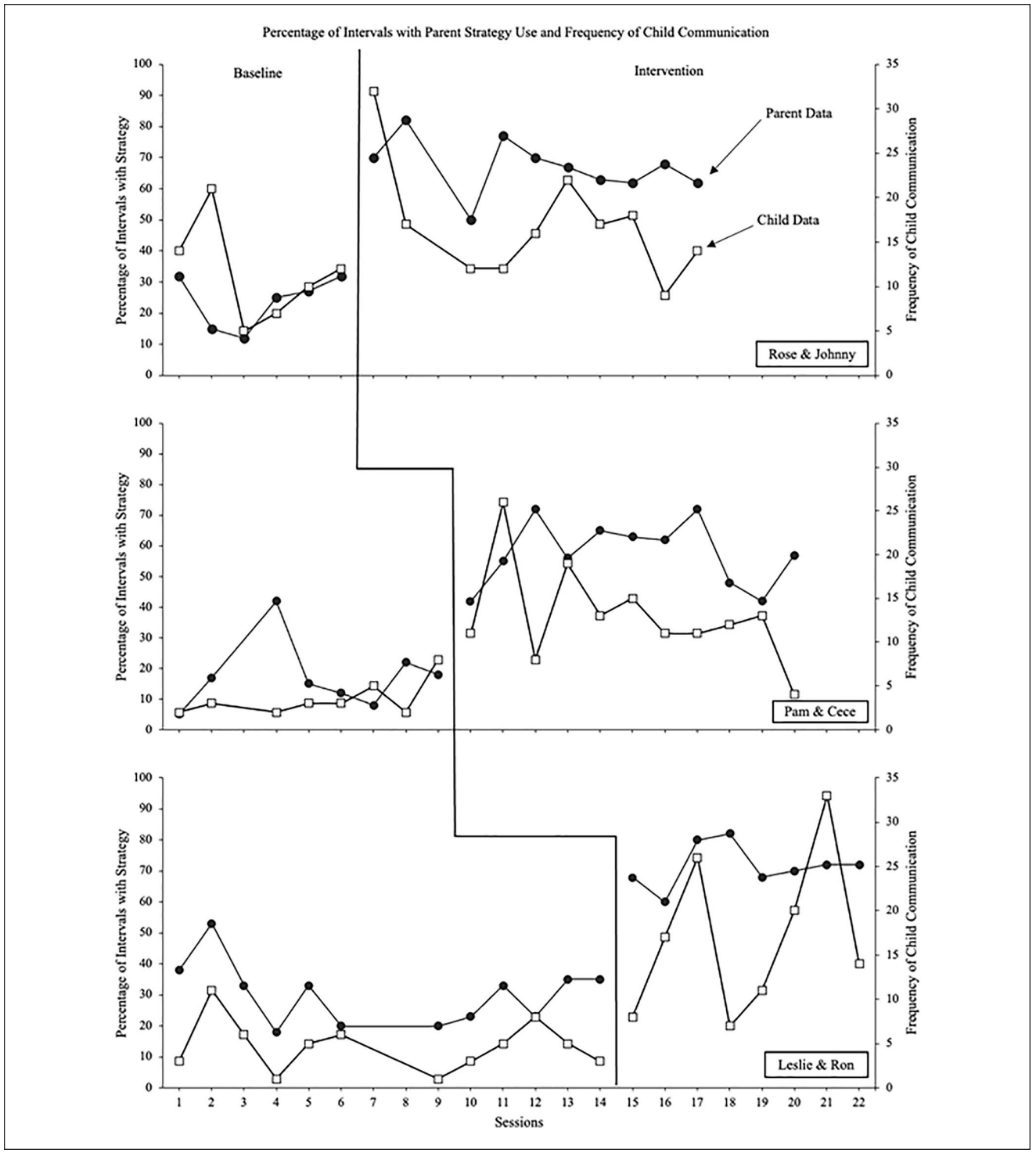

Figure 2. Percentage of intervals with total parent strategy use and frequency of child communication.
Note. Parent data are represented on the primary *y*-axis as a line graph. Child data are represented as a secondary *y*-axis as a line graph.

data (range 50%–82%). There was a demonstration of a basic effect between the intervention and Rose's strategy use. Johnny's communicative combinations of a noun and either a verb and/or an adjective communication immediately increased in level followed by a decreasing trend with high levels of variability and some overlapping data (range 9–32). A basic effect between the intervention and Johnny's communication was not present.

Dyad 2: Pam and Cece. During baseline, Pam's total strategy use initially steadily increased before decreasing in level with some variability (range 5%–42%). Cece's communication (i.e., gestures or word approximations with at least one correct phoneme) remained at low levels with minimal variability (range 2–8).

After training, Pam's total strategy usage immediately increased in level with minimal overlap and moderate variability (range 42%–72%). There was a demonstration of a basic effect between the intervention and parent strategy usage. Cece's communication immediately increased in level with a high degree of variability and minimal overlapping data (range 4–26), demonstrating a basic effect between the intervention and child communication.

Dyad 3: Leslie and Ron. Prior to intervention, Leslie's total strategy usage indicated moderate levels of strategy use with minimal variability (range 18%–53%). Ron's communication (i.e., non-echoic word approximations with at least one correct phoneme) remained at low levels with minimal variability (range 1–11).

After training, Leslie's total strategy use immediately increased in level with minimal variability that sustained throughout the phase with no overlapping data (range 60%–80%), demonstrating a basic effect. Ron's word approximations that included at least one correct phoneme slightly increased in level with a high degree of variability and minimal overlapping data (range 7–33), suggesting a demonstration of a basic effect.

Parent Perceptions of Training and Coaching

All parents participated in the social validity interviews. Rose (Dyad 1) and Pam (Dyad 2) provided the highest possible rating for all questions. Leslie (Dyad 3) rated all but three questions with the highest possible rating. Specifically, she gave a four out of five for how well the goal of the intervention fit her goals for Ron, and how well she liked the two strategies of *Arrange Environment* and *Wait*. Pam shared, "It was just really helpful to review videos and actually see [Cece] responding, and seeing myself and learning . . . how we could carry on to the next session." No parent expressed any disadvantages, discomfort, or undesirable side effects from the intervention. All parents mentioned other family members adopting the strategies and that they planned to continue incorporating the strategies in their daily routines.

Discussion

This study provides preliminary evidence that an intervention package consisting of an initial parent-training, joint reflections, and video feedback coaching that occur via telepractice can successfully increase parent-implemented NDBIs. To our knowledge, this research was the first parent-implemented communication intervention to explicitly rely on joint reflections and video feedback as the primary coaching methods. Video feedback combined with joint reflections may be an efficient and effective coaching tool to enhance family capacity to support child communication and language during everyday play routines.

Parental communication strategy use increased for all three tiers following training, joint reflections, and video feedback coaching. Given the cascading logic model of parent-implemented interventions, the moderate increases in child communication are to be expected. Taken as a whole, these data are promising and suggest that joint reflections with video feedback coaching in NDBIs delivered via telepractice may increase parental strategy use, leading to increases in child communication.

All three parents shared how much they enjoyed and benefited from the video feedback coaching, aligning with Bandura's Social Learning Theory. Video feedback capitalizes on the strengths of parent–child communicative interactions (Bandura, 1986). Recent research suggests that parents desire viewing video feedback for education and self-reflection (Bhana, 2021). Parents may have felt empowered and more efficacious in supporting their child's communication by being able to view themselves accurately incorporating the strategies with their child during naturally occurring routines and activities in their home (DEC, 2014).

Implications for Practice

Our results have several implications for early interventions. First, research evaluating the effects of parent-implemented NDBIs delivered via telepractice have primarily included young children with ASD (Akemoglu et al., 2020; Rakap & Rakap, 2014). This telepractice study is the first to include a child with William's syndrome and a child with a communication delay that did not co-occur with an intellectual disability. Given the heterogeneity of communication levels, age, and disability with the children in the current study, we suggest video feedback coaching on NDBIs delivered online may be beneficial for a wide range of communication delays.

Second, joint reflections and video feedback may be an effective and efficient coaching tool for early interventionists and early childhood special educators to employ. Joint reflections and video feedback coaching naturally align with strength-based family capacity building and empowerment best practices (e.g., family capacity-building practices; DEC, 2014). As such, combining joint reflections with video feedback coaching allows early intervention practitioners to incorporate several best practices in a streamlined manner. Moreover, video feedback coaching could offer an option for practitioners to provide feedback

during routines that are difficult to observe in real time due to scheduling conflicts or other barriers. For example, parents could video record interactions with other family members, such as a parent who works during the time when the early interventionist visits the home, or even extended family members. Importantly, video feedback coaching will not replace the important in-person interactions between families and professionals, yet it could supplement current coaching and serve as an effective *and* efficient tool for practitioners to consider. It should be noted that not all families who receive early intervention have access to technology and stable internet, and not all families will find play-based interventions appealing. Therefore, it is critical for interventionists to consider the family's time, resources, and preferences before developing an intervention plan. Further, the participants within the current research study were White and English-speaking families. Additional research is needed to understand the feasibility and acceptability of this coaching model with a more diverse population.

Limitations and Future Directions

Despite the positive findings of our study, there are limitations that should be considered. First, there were several videos that did not capture the audio during the recording, leading to missed interactions, word approximations, and play activities. The silence within the video recordings may have been due to an automatic setting within the online video conferencing platform that mutes background noise. Future research should explore parents self-recording play interactions between themselves and their child. Second, an analysis of the change in each strategy over time was not evaluated. Therefore, it is unclear what specific strategy had the most impact on child communication. Future research may evaluate parent individual strategy use over time and the impact each has on child communication. Third, we evaluated a coaching package that included joint reflections and video feedback. As such, it is unclear if joint reflections or video feedback alone could lead to similar results. Future research should isolate the coaching components (i.e., video feedback and joint reflections) to determine the effects of individual coaching methods. Finally, the experimental design did not evaluate maintenance data or explicitly evaluate how well the intervention generalized to non-play activities. Future research should evaluate how well parental strategy use and child social communication is maintained over time or generalized (e.g., across people).

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Ciara L. Ousley https://orcid.org/0000-0003-0789-0344
Tracy J. Raulston https://orcid.org/0000-0003-3166-7716
Christina S. Gilhuber https://orcid.org/0000-0001-9738-8440

Supplemental Material

Supplemental material for this article is available on the *Topics in Early Childhood Special Education* website with the online version of this article.

References

Akemoglu, Y., Muharib, R., & Meadan, H. (2020). A systematic and quality review of parent-implemented language and communication interventions conducted via telepractice. *Journal of Behavioral Education*, *29*(2), 282–316. https://doi.org/10.1007/s10864-019-09356-3

Balldin, S., Fisher, P. A., & Wirtberg, I. (2018). Video feedback intervention with children: A systematic review. *Research on Social Work Practice*, *28*(6), 682–695. https://doi.org/10.1177/1049731516671809

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Barton, E. E., Chen, C. I., Pribble, L., Pomes, M., & Kim, Y. A. (2013). Coaching preservice teachers to teach play skills to children with disabilities. *Teacher Education and Special Education*, *36*(4), 330–349.

Barton, E. E., & Wolery, M. (2008). Teaching pretend play to children with disabilities: A review of the literature. *Topics in Early Childhood Special Education*, *28*(2), 109–125.

Bhana, N. Y. (2021). *Collateral effects of photographs and the tell me more intervention package on the reminiscing style of mothers and their children with and at risk for autism*. The Pennsylvania State University.

Bolton, S., & Hattie, J. (2017). Cognitive and brain development: Executive function, Piaget, and the prefrontal cortex. *Archives of Psychology*, *1*(3), 1–36.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments in nature and design*. Harvard University Press.

Bruinsma, Y., Minjarez, M., Schreibman, L., & Stahmer, A. (2020). *Naturalistic developmental behavioral interventions for autism spectrum disorder*. Paul H. Brookes Publishing Co.

Coogle, C. G., Ottley, J. R., Storie, S., Rahn, N. L., & Kurowski-Burt, A. (2020). Performance-based feedback to enhance preservice teachers' practice and preschool children's expressive communication. *Journal of Teacher Education*, *71*(2), 188–202.

Division for Early Childhood. (2014). *DEC recommended practices in early intervention/early childhood special education 2014*. https://www.dec-sped.org/dec-recommended-practices

Ence, W. A. (2012). *Effects of video feedback on parent implementation of pivotal response treatment*. University of California.

Fenson, L., Dale, P., Reznick, J. S., Thal, D., Bates, E., Hartung, J., Pethick, S. J., & Reilly, J. (1993).*The MacArthur communicative development inventories: User's guide and technical manual*. Singular.

Friedman, M., Woods, J., & Salisbury, C. (2012). Caregiver coaching strategies for early intervention providers: Moving toward operational definitions. *Infants & Young Children*, *25*(1), 62–82. https://doi.org/10.1097/IYC.0b013e31823d8f12

Fuller, E. A., & Kaiser, A. P. (2020). The effects of early intervention on social communication outcomes for children with autism spectrum disorder: A meta-analysis. *Journal of Autism and Developmental Disorders*, *50*(5), 1683–1700. https://doi.org/https://doi.org/10.1007/s10803-019-03927-z

Fuller, F. F., & Manning, B. A. (1973). Self-confrontation reviewed: A conceptualization for video playback in teacher education. *Review of Educational Research*, *43*(4), 469–528. https://doi.org/10.3102/00346543043004469

Hampton, L. H., & Kaiser, A. (2016). Intervention effects on spoken-language outcomes for children with autism: a systematic review and meta-analysis. *Journal of Intellectual Disability Research*, *60*(5), 444–463. https://doi.org/10.1111/jir.12283

Hampton, L. H., Kaiser, A. P., Nietfeld, J. P., & Khachoyan, A. (2021). Generalized effects of naturalistic social communication intervention for minimally verbal children with autism. *Journal of Autism and Developmental Disorders*, *51*(1), 75–87. https://doi.org/10.1007/s10803-020-04521-4

Harris, S. L., & Handleman, J. S. (2000). Age and IQ at intake as predictors of placement for young children with autism: A four-to six-year follow-up. *Journal of Autism and Developmental Disorders*, *30*(2), 137–142. https://doi.org/10.1023/A:1005459606120

Hebbler, K., Spiker, D., Bailey, D., Scarborough, A., Mallik, S., Simeonsson, R., Singer, M., & Nelson, L. (2007). *Early intervention for infants and toddlers with disabilities and their families: Participants, services, and outcomes* (Final report from the National Early Intervention Longitudinal Study [NEILS]). NEILS.

Hume, K., Steinbrenner, J. R., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendry, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2021). Evidence-based practices for children, youth, and young adults with autism: Third generation review. *Journal of Autism and Developmental Disorders*, *51*, 4013–4032. https://doi.org/10.1007/s10803-020-04844-2

Ingersoll, B., & Dvortcsak, A. (2019). *Teaching social communication to children with autism and other developmental delays (2-book set): The project ImPACT guide to coaching parents and the project ImPACT manual for parents*. Guilford Publications.

Kasari, C., Locke, J., Gulsrud, A., & Rotheram-Fuller, E. (2011). Social networks and friendships at school: Comparing children with and without ASD. *Journal of Autism and Developmental Disorders*, *41*(5), 533–544. https://doi.org/10.1007/s10803-010-1076-x

Kopp, C. B., Baker, B. L., & Brown, K. W. (1992). Social skills and their correlates: Preschoolers with developmental delays. *American Journal on Mental Retardation*, *96*(4), 357–366.

Lang, R., Hancock, T. B., & Singh, N. N. (Eds.). (2016). *Early intervention for young children with autism spectrum disorder*. Springer.

Larson, J. R., Jr. (1984). The performance feedback process: A preliminary model. *Organizational Behavior and Human Performance*, *33*(1), 42–76.

Machalicek, W., Lequia, J., Pinkelman, S., Knowles, C., Raulston, T., Davis, T., & Alresheed, F. (2016). Behavioral telehealth consultation with families of children with autism spectrum disorder. *Behavioral Interventions*, *31*(3), 223–250. https://doi.org/10.1002/bin.1450

Machalicek, W., Raulston, T., Drew, C., & Ruppert, T. (2015). Telehealth behavioral consultation with families of children with autism. *The International Society for the Study of Behavioural Development (ISSBD). Bulletin Special Section on Autism Spectrum Disorder*, *39*(6), 9–14.

Machalicek, W., Raulston, T., Knowles, C., Ruppert, T., Carnett, A., & Alresheed, F. (2016). Challenging behavior. In J. L. Matson (Ed.), *Comorbid conditions among children with autism spectrum disorders* (pp. 137–170). Springer.

McIntyre, L. L., Kunze, M., Barton, H., & Luehring, M. (2021). Early intervention for children with intellectual and developmental disabilities. In L. M. Glidden, L. Abbeduto, L. L. McIntyre, & M. J. Tassé (Eds.), *APA handbook of intellectual and developmental disabilities: Clinical and educational implications–Prevention, intervention, and treatment* (pp. 3–22). American Psychological Association. https://doi.org/10.1037/0000195-001

McIntyre, L. L., & Zemantic, P. K. (2017). Examining services for young children with autism spectrum disorder: Parent satisfaction and predictors of service utilization. *Early Childhood Education Journal*, *45*(6), 727–734. https://doi.org/10.1007/s10643-016-0821-y

Meadan, H., Snodgrass, M. R., Meyer, L. E., Fisher, K. W., Chung, M. Y., & Halle, J. W. (2016). Internet-based parent-implemented intervention for young children with autism: A pilot study. *Journal of Early Intervention*, *38*(1), 3–23. https://doi.org/10.1177/1053815116630327

National Research Council. (2001). *Educating children with autism*. National Academies Press.

Pepperdine, C. R., & McCrimmon, A. W. (2018). Test review: Vineland adaptive behavior scales, (Vineland-3) by Sparrow, SS, Cicchetti, DV, & Saulnier, CA. *Canadian Journal of School Psychology*, *33*, 157–163.

Phaneuf, L., & McIntyre, L. L. (2007). Effects of individualized video feedback combined with group parent training on inappropriate maternal behavior. *Journal of Applied Behavior Analysis*, *40*(4), 737–741. https://doi.org/10.1901/jaba.2007.737-741

Rakap, S., & Rakap, S. (2014). Parent-implemented naturalistic language interventions for young children with disabilities: A systematic review of single-subject experimental research studies. *Educational Research Review*, *13*, 35–51. https://doi.org/10.1016/j.edurev.2014.09.001

Raulston, T. J., Bhana, N., McIntyre, L. L., & Ousley, C. (2021). Brief report: Collateral joint engagement during a playdate intervention for children with and at risk for autism. *Journal of Autism and Developmental Disorders*, *51*(1), 357–363. https://doi.org/10.1007/s10803-020-04544-x

Raulston, T. J., Hansen, S. G., Frantz, R., Machalicek, W., & Bhana, N. (2020). A parent-implemented playdate intervention for young children with autism and their peers.

Journal of Early Intervention, *42*(4), 303–320. https://doi.org/10.1177/1053815119880943

Raulston, T. J., Hieneman, M., Caraway, N., Pennefather, J., & Bhana, N. (2019). Enablers of behavioral parent training for families of children with autism spectrum disorder. *Journal of Child and Family Studies*, *28*(3), 693–703. https://doi.org/10.1007/s10826-018-1295-x

Reimers, T. M., Wacker, D. P., & Cooper, L. J. (1991). Evaluation of the acceptability of treatments for children's behavioral difficulties: Ratings by parents receiving services in an outpatient clinic. *Child & Family Behavior Therapy*, *13*(2), 53–71

Roberts, M. Y., & Kaiser, A. P. (2015). Early intervention for toddlers with language delays: A randomized controlled trial. *Pediatrics*, *135*(4), 686–693. https://doi.org/10.1542/peds.2014-2134

Romano, M., & Schnurr, M. (2022). Mind the gap: Strategies to bridge the research-to-practice divide in early intervention caregiver coaching practices. *Topics in Early Childhood Special Education*, *42*, 64–76. https://doi.org/10.1177/0271121419899163

Ruppert, T., Machalicek, W., Hansen, S., Raulston, T., & Frantz, R. (2016). Parent implemented early intervention. In R. Lang, T. Hancock, & N. N. Singh (Eds.), *Early intervention for young children with autism* (pp.219–256). Springer.

Schreibman, L., Dawson, G., Stahmer, A. C., Landa, R., Rogers, S. J., McGee, G. G., Kasari, C., Ingersoll, B., Kaiser, A. P., Bruinsma, Y., McNerney, E., Wetherby, A., & Halladay, A. (2015). Naturalistic developmental behavioral interventions: Empirically validated treatments for autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *45*(8), 2411–2428. https://doi.org/10.1007/s10803-015-2407-8

Simacek, J., Elmquist, M., Dimian, A. F., & Reichle, J. (2021). Current trends in telehealth applications to deliver social communication interventions for young children with or at risk for autism spectrum disorder. *Current Developmental Disorders Reports*, *8*, 15–23. https://doi.org/10.1007/s40474-020-00214-w

Snyder, P. A., Hemmeter, M. L., & Fox, L. (2015). Supporting implementation of evidence-based practices through practice-based coaching. *Topics in Early Childhood Special Education*, *35*(3), 133–143. https://doi.org/10.1177/0271121415594925

Stern, D. (1971). A microanalysis of mother-infant interaction. *Journal of the American Academy of Child Psychiatry*, *10*(3), 501–517. https://doi.org/10.1016/S0002-7138(09)61752-0

U.S. Department of Education. (2020). *42nd annual report to congress on the implementation of the Individuals with Disabilities Education Act*. Author. https://sites.ed.gov/idea/files/42nd-arc-for-idea.pdf

Vandervert, L. (2017). Vygotsky meets neuroscience: The cerebellum and the rise of culture through play. *American Journal of Play*, *9*(2), 202–227.

Vygotsky, L. (1978). *Mind and society: The development of higher mental processes*. Cambridge University Press.

Wallander, J. L., Biasini, F. J., Thorsten, V., Dhaded, S. M., de Jong, D. M., Chomba, E., Pasha, O., Goudar, S., Wallace, D., Chakraborty, H., Wright, L. L., McClure, E., & Carlo, W. A. (2014). Dose of early intervention treatment during children's first 36 months of life is associated with developmental outcomes: An observational cohort study in three low/low-middle income countries. *BMC Pediatrics*, *14*(1), 1–11.

Wattanawongwan, S., Ganz, J. B., Pierson, L., Yllades, V., Liao, C. Y., & Ura, S. K. (2022). Communication intervention implementation via telepractice parent coaching: Parent implementation outcomes. *Journal of Special Education Technology*, *37*, 35–48. https://doi.org/10.1177/0162643420950026