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Coaching Parents to Use Naturalistic Developmental Behavioral Interventions

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ABSTRACT

This practitioner article examines the use of Naturalistic Developmental Behavioral Interventions (NDBIs) to enhance communication skills through the vignette of a 4-year-old with speech delays. Through brief coaching sessions, the child's parents learned techniques like imitation and prompting, integrating them into daily routines to improve vocal communication. The intervention highlighted the effectiveness of engaging caregivers as active participants and tailoring strategies to family contexts, leading to positive outcomes for both the child and family. This article outlines the procedures for practitioners to coach parents to implement evidence-based practices that can promote academic and behavioral growth in a naturalistic setting.

KEYWORDS

naturalistic, telecoaching, early childhood

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Consider the following vignette of a student who an interventionist may encounter as they begin their career in Early Childhood education.

Lee, a 4-year-old boy, resides in a household with his parents and three older sisters, adopted from abroad at the age of 2. During his international adoption check-up, professionals diagnosed him with speech and developmental delays. Despite undergoing two years of speech therapy, his family still encounters challenges in understanding his speech consistently. Their major concern is Lee's limited use of vocal speech to initiate interactions and express his wants and needs within their home. For example, Lee will often communicate his wants and needs using gestures that are often difficult to understand.

Feeling both hopeful and eager for effective strategies, Lee's mother, Ann, reaches out to Ms. L, a trained early-childhood interventionist. After extensive discussions and planning, they decide to introduce Naturalistic Developmental Behavioral Interventions (NDBIs) into Lee's daily routines. These strategies are selected to assist Lee in enhancing his initiation of vocal communication and prolonging the length of his utterances and interactions within his home environment. The interventionist and Lee's mother, Ann, agree to participate in a series of filmed training sessions to help guide and shape the implementation of these strategies in Lee's home.

The early years of childhood play a crucial role in laying the foundation for children's future academic and social success. During this period, young children acquire essential skills through interactions with individuals in their environment, including caregivers, educators, and peers. Early communication encompasses the initial forms of expressing needs and interacting with others, such as cooing, babbling, and early use of gestures. Language and social communication abilities are developed and honed through early exposure to language and interaction with others (Hart & Risley, 1995; Moore, et.al, 2014). These developments typically occur within early years and are foundational for later cognitive and social abilities. However, young children who are at-risk or have disabilities are less likely than their typically developing peers to engage in various forms of communication (Lane & Brown, 2016). Delays in communication and language development can disrupt these developmental pathways, potentially leading to adverse long-term outcomes in both academic and social domains.

Immediate effects of delays in communication and language include the inability to interact with the surrounding environment, potentially leading to behavioral challenges and family stress (Kaiser & Roberts, 2013). Early detection and intervention are essential to address these initial challenges and to support families in adapting to and managing these unexpected developmental delays. Long-term implications of unaddressed communication and language delays may result in continued language disorders, impacting academic performance and literacy (Kaiser & Trent, 2007). Social challenges may also arise, affecting peer relationships and emotional well-being (Wright et al., 2013a, 2013b). For families, this can mean a commitment to ongoing support, which can be resource-intensive and stressful. Fortunately, there many interventions that a parent can provide for their children in their own homes that would support language acquisition (Ouyang, et al., 2024). These interventions are known as Naturalistic Developmental Behavioral Interventions.

What Are Naturalistic Developmental Behavioral Interventions (NDBIs)?

Naturalistic teaching serves as the bedrock of contemporary early intervention, emphasizing the significance of the child's innate interests and environment in the learning process. Older, more traditional interventions used to address language and communication deficits often required highly-trained interventionists in a clinical setting. Many of these interventions such as direct trial training (DTT) emphasized rote memory, repetition, flashcard drills, and artificial reinforcers to produce desired results (LeBlanc et al., 2006) Many of these interventions may be effective in a lab setting, but could not be transferred to a new, more natural setting. The current evidence-based interventions recommended to practitioners, including responsive interaction and individual environmental teaching strategies, emphasize routine play and family interactions to cultivate these essential skills outside of a clinical setting. For example, through verbal (e.g., spoken words) or nonverbal (e.g., gestures, signs) interactions between a caregiver and a child who is at-risk or

has a recognized disability, naturalistic teaching strategies use the child's interests and communicative initiations as opportunities to model and prompt language in everyday routines and activities (Kaiser & Trent, 2007).

These natural, socially valid, age-appropriate activities provide a source for natural reinforcement that other more traditional interventions could not reproduce. For example, an older intervention may employ a clinician in a laboratory setting to work one-on-one with a child on a communication strategy to identify animals using index cards. Further, each time a child gets an answer correct, they get one piece of preferred candy. Is this natural? Is this activity fun or interesting for the child or the interventionist? No! Now imagine, a child playing with a group of stuffed animals and their caregiver. The caregiver asks the child to pick up the horse and when they do, they are given praise, attention, and even an animal noise. The difference between these interventions is substantial and the outcomes could be similar. Numerous studies and recent meta-analyses show naturalistic teaching strategies have consistently demonstrated the effectiveness of naturalistic strategies on various language forms and structures (Duncan, et al., 2024; Wright, et al., 2013a, 2013b) across settings (Alpert & Kaiser, 1992; Frost et al., 2022; Hancock & Kaiser, 1996; Kaiser, et al., 2000) and disability category (Pope et al., 2024).

Under the umbrella of naturalistic teaching, a smaller group of interventions, known as Naturalistic Developmental Behavioral Interventions (NDBIs), are evidence-based, specific interventions that combine developmental and behavioral strategies to foster key aspects of communication, such as imitation and forming complex sentences. Core NDBI programs include Enhanced Milieu Teaching (EMT), Joint Attention, Symbolic Play, Engagement, and Regulation (JASPER), and Pivotal Response Training (PRT), each with a strong emphasis on naturalistic, play-based interactions (Schreibman et al., 2015). The individual strategies that form the building blocks of NDBIs, like responsive interaction and milieu teaching, serve as the basis for a meaningful strategy that caregivers can use during play. For example, responsive interaction strategies allow caregivers to capitalize on their child's initiations and interests, thereby fostering an interactive, communicative exchange (Hancock & Kaiser, 1996). Meanwhile, milieu teaching strategies allow caregivers to model language, provide expansions of the child's communicative attempts, and arrange the environment to naturally elicit language (Kaiser, Hancock, & Nietfeld, 2000).

While researchers are familiar with these practices, many caregivers are unaware of how to support the children in their lives. The rapid coaching model presented in this article is tailored to empower caregivers, particularly those navigating service waiting-lists or seeking to enhance their foundational techniques to foster communication and language in children. By customizing NDBIs to the individual needs of caregivers, this approach accelerates the learning process and intensifies the engagement during family sessions. Strategies such as imitation and narration are supplemented with expanding language, in which caregivers learn to build upon the child's communication. Additionally, varied prompting techniques, such as open-ended questions or modeling, facilitate the child's ability to initiate and respond in communication exchanges. These selected NDBIs align with current recommendations of providing services to young children in a play-based format in typical settings using age-appropriate materials during play (DEC of the Council for Exceptional Children, 2014).

Imitation

Correct imitation involves the adult reproducing child's play actions with same, similar, or pretend materials (Lane et al., 2016). Utilizing the imitation strategy, a parent can connect and interact with their child simply by participating in their chosen activity and reinforcing their need for attention and feedback. For example, while child flies an airplane into air, and the parent imitates this action by flying a piece of block into air. In this example, the caregiver can also imitate any other sounds or actions that the child is actively engaging in.

Narration

Play narration refers to the adult description of what the child is doing or the movements and actions of a toy that the child is manipulating. You can think of narration as simply giving voice to the activity the child is participating in. For example, the caregiver may include statements such as, "whoa that car is going fast" or "that plane is flying really high!" (Lane et al., 2016).

Expanding and Mapping Language

In this strategy, caregivers echo the child's verbal attempts, adding complexity to increase linguistic depth. Caregivers play a crucial role in expanding and enriching a child's language during play (Harrington & Hadley, 2024; Lee et al., 2023; Theron, 2022). They can achieve this by echoing the child's verbalizations and then building upon them with more descriptive language or by introducing new vocabulary. For example, if a child says, "Car go," the caregiver might respond with, "Yes, the red car is going fast!" This not only reinforces the child's communication, but also introduces new words and concepts, expanding their linguistic skills.

Prompting

The types of NDBIs use strategic questions or cues are used to provoke language use or action from the child, encouraging independent communication. Caregivers employ various prompting strategies to promote language and interaction in children. One approach is using open-ended questions combined with a model prompt (Harrington & Hadley, 2024; Lee et al., 2023; Theron, 2022). For example, if a child is playing with a dollhouse, the caregiver might ask, "What do you think happens next?" This prompts the child to think and respond, while the caregiver provides a model if needed, saying, "maybe the family goes on a picnic." This prompt may encourage the child's verbal participation and imaginative thinking. Other common approaches include intentionally making a small mistake, acting silly, or creating a problem that the child can help solve encourages them to communicate, and offering the child choices throughout their routine to motivate them to communicate their preference.

Environmental Arrangement and Responding (EAR)

In this strategy, the adult needs to prevent access to wanted items or activities and provide access contingently to a child's request (Lane et al., 2016). First, the adult withholds access to materials and gain child's attention. Then, the adult waits up to 3 s for child to make a request. If the child demonstrates an interest in the materials but did not vocalize, the adult provides a language model (e.g., "say 'can I have the block'"), and waits up to 3 s for the child to imitate the vocal model.

The child earns access to the toy if he/she imitates the model, or the adult removes the object if the child lost interest (e.g., oriented away from the adult, playing with another item).

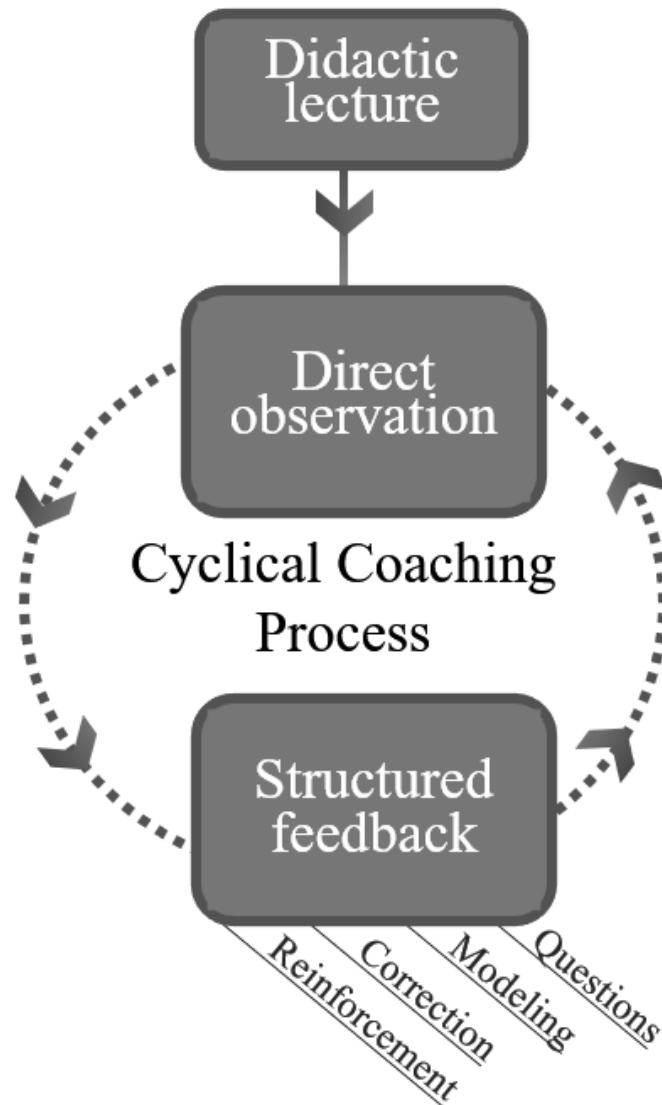
Teaching Caregivers to Use NDBIs

As the primary agents of positive change in the overall development of children, caregivers spend a substantial amount of time interacting with young children with disabilities. Parents should also be in the position of teaching children in their natural environments, which supports the generalization of their newly gained skills since children have the opportunity to practice their skills in their daily routines and activities (Woods et al., 2004). Research has consistently demonstrated the positive effects of caregiver-implemented interventions with children with language and communication needs, with results indicating that caregivers can effectively conduct interventions with fidelity and improve children's learning outcomes (Gillett & LeBlanc, 2007; Kashinath et al., 2006; Roberts & Kaiser, 2011). Additionally, involvement of parents in the intervention of young children with disabilities is also emphasized by policy and practice (DEC, 2014; NAEYC, 2015).

The role of the early interventionists and other practitioners is not only to directly work with the child, but also to promote parents' capacity that results in adults' competence, confidence, and effective use of naturalistic strategies to positively engage with the child (McWilliam, 2012). When these interventions are applied correctly, parents can be successful interventionists in their own home environments while they naturally interact with their children during play or other activities (Rogers et al., 2022). This fidelity to the intervention is important to help ensure the most positive outcomes available. Therefore, it is necessary for early interventionists and other service providers to use coaching to support parental participation in interventions that enhance child language and communication outcomes in their home environment.

To meet the need of parent coaching, a multi-component, brief coaching package that mirrors common dosages provided through Part C early intervention service was evaluated across parent/caregiver-child dyads, behaviors and cultural/language environments (Lane et al., 2016; Zhu et al., 2022). This coaching model, designed for caregivers awaiting services or seeking foundational methods builds on existing caregiver skills and adapting to their unique needs. The purpose is to equip caregivers with a toolkit, from imitation to advanced prompting, to foster communication and language development. The total duration of this training package consisted of three to six 1-hour contacts with each family, during which parents were trained on selected NDBIs and have shown both cost and time effective. This coaching intervention was relatively rapid comparing to other parent coaching studies. For example, in some studies (Roberts et al., 2014; Roberts & Kaiser, 2015) parents received two 40-minute clinic sessions each week for 12 weeks, or 1 clinic session and 1 home session once a week for 3 months.

Using components similar to the brief coaching package, researchers can successfully teach caregivers to use naturalistic instructional procedures within the context of their daily activities (Hatcher et al., 2018; Zhu et al., 2022). Please see Figure 1 below for a visual representation of the coaching process.

Figure 1. Sequence of Training Components Within the Brief Coaching Package

A Rapid Coaching Package

The coaching process identified in this article was developed from previous research in coaching caregivers (Lane et al., 2016; Hatcher et al., 2018; Zhu et al., 2022). A trained practitioner can coach a parent to use NDBIs in the natural environment that they interact with the child by following the described coaching procedures. The coaching strategies are (a) a didactic lecture and video examples, (b) observation and coaching, and (c) post-session feedback. A summary of the coaching strategies can be found in Table 1.

Table 1. Procedure of Coaching Package

Coaching package sequence	Duration	Procedures
Video examples and didactic lecture	2-3 min	1. Introduction to NDBIs and their importance in a home setting 2. Provide any necessary handouts on how to identify the behavior to change (increase or decrease) 3. Two to three video examples of the target behavior demonstrated in the natural setting 4. Introduce data collection strategies 5. Ensure the parent knows the details of the intervention(s) and can implement with fidelity 6. Opportunities for parents to ask questions
Observation and coaching (recorded)	4 min	1. Parent/teacher is asked to practice target behavior with the child 2. Session(s) are recorded for both child and caregiver behavior 3. Expectations and intervention details are continually reviewed 4. Behavior-specific praise for target behaviors, and direct adult attention to possible opportunities for target strategy 5. Specific feedback is given regarding what the caregiver is doing well and what can be improved in real-time (coaching) 6. The parent/caregiver reflects on their own implementation in real-time (coaching)
Post-session feedback	2-3 min	1. The interventionist begins by reviewing NDBIs and their importance in the home environment 2. Interventionist reviews strengths and areas of growth after the session 3. Opportunities for parent/teacher to ask questions and reflect 4. An action plan is developed 5. A plan for generalization is created to make sure the targeted behavior will be demonstrated in new or different settings

In this package, NDBIs are taught to parents/teachers in a sequential manner over the course of three 1-hour visits using a brief coaching package in accordance with prior research (Lane et al., 2016; Zhu et al., 2022). The individual receiving the coaching is presented with 3-6 coaching and feedback sessions to master strategies of narration and imitation, depending on

adult's education level and proficiency of English language. EAR usually takes 5-8 sessions before the adult meets criteria of learning.

Video Examples and Didactic Lecture

This part of training typically takes 2 to 3 minutes and only take place once at the beginning of training on each target strategy. The trainer (a) shows and discusses a video model of an actor demonstrating the target strategy, (b) provides a rationale for using target naturalistic strategy and how the behavior could be used during a play session, and (c) encourages the adult to ask questions.

At the outset of the initial training session, Ms. L meets with Lee's parents in the living room while Lee engaged in playful activities with his siblings. Recognizing the importance of tailoring the approach to suit Lee's family dynamics and strengths, Ms. L initiates a dialogue with Ann and her husband to understand their unique context and preferences.

With this foundation in mind, Ms. L strategically selects and presents a series of video demonstrations showcasing targeted behavioral techniques. These include narration, imitation, expanding and mapping language, and prompting strategies, carefully chosen to resonate with Lee's parents and align with their existing strengths and communication style. Through vivid examples and practical scenarios, Ms. L illustrates how these strategies can seamlessly integrate into the fabric of everyday interactions within the family.

Following the viewing, Ms. L and Lee's parents then review printed materials describing selected NDBIs before initiating the interventions at home under the supervision of the interventionist. Drawing from Ann and her husband's insights and feedback, Ms. L ensures that the chosen interventions resonate with their values, preferences, and aspirations for Lee's development. Together, they collaboratively prepare for the implementation of these strategies under Ms. L's expert guidance, fostering a sense of empowerment and ownership within Lee's family as they embark on this transformative journey of growth and communication. Before introducing the next component, EAR, Ms. L asks Lee's parents if they have any questions or other input for additional consideration.

Observation and Coaching

The coaching session typically last 4 minutes each, an entire session should be recorded for later feedback purposes. The instructional coach begins the session by asking the parent(s) to practice the target behavior using the child's name. During coaching sessions, the instructional coach (a) provides behavior-specific praise to indicate when the parent correctly used the target instructional strategy, and (b) directs the parent's attention to opportunities to demonstrate the behavior. After each session, the instructional coach engages in a structured sequence of feedback behaviors with the parent. The sequence of requisite training components can be found in Figure 1.

Ann and her husband quickly mastered the techniques of narration, imitation, expanding and mapping language, and prompting strategies, demonstrating remarkable progress within just two home visits. They seize every interaction opportunity, whether during playtime or snack breaks, to implement these strategies with Lee. Utilizing narration and imitation, they engage with Lee's play activities, such as the littlest pet shop playset, describing the item and action Lee was engaging with as "a bus, you are pushing a bus," while mirroring Lee's actions by pushing another bus alongside him. Encouraged by Lee's

responses, Ann expands on his language by affirming, "Yes, a little bus is going fast! Where do you think it's headed?"

After several coaching sessions, Ms. L praised the parents for their implementation and encourages them to incorporate more prompting strategies and intentionally create additional communication temptations for Lee. Embracing the spirit of creativity, Ann and her husband introduce a playful twist during snack time by placing cookies on a toy car instead of a plate. This sparks laughter from Lee, who protests, "No! Cookie not there!" Their spontaneous and imaginative approach fosters joyous moments of interaction and cultivates Lee's communicative abilities in unexpected and delightful ways.

As they progress through the interventions, including EAR (Environmental Arrangement and Responding), Lee's parents encounter challenges and successes. During a play session supervised by Ms. L, Lee's mother struggles to capture his attention while he's engrossed in block play. Sensing an opportunity, Ms. L suggests a simple yet effective tactic: stacking and knocking over blocks to elicit Lee's response. As Lee's mother follows the direction, Lee stops playing to look at his mother and points at the blocks to ask for more! One of Lee's goals is to extend number of words in his utterances, so his mother prompts him to do it one more time.

Post-Session Feedback

The feedback sessions are usually 2-3 minutes long. The structured feedback consisted of a) praising specific occurrences of the parent engaging in the target behavior, b) highlighting missed opportunities or changes that the parent should make when using the strategy, c) providing an opportunity to watch a video model of the target behavior, and d) asking if the parent had any questions.

In subsequent coaching and feedback sessions, Ms. L continues to provide guidance and support, helping Ann refine her implementation of NDBIs and adapt them to different contexts. After the final coaching session, Ms. L reviews all training videos with Ann and provides feedback on what she did well as well as specific areas needing improvement. Ms. L and Ann also discuss strategies to apply Lee's newly acquired communicating skills to new environments and how to continue developing proficiency in his interactions with others. Finally, by completing all requisite coaching and feedback sessions, Ann masters all three strategies and Lee is much more capable of initiating and sustaining communication with his mother and the rest of his family! Through tailored coaching and consistent practice, Lee and his family embark on a journey of communication growth.

Under some circumstances, modification of this process may be needed. For example, change of parental engagement during interaction can cause issues in the child's interactions during the coaching process. In Ann and Lee's case, the coach conducted the feedback session without reviewing the last practice video. Ann remained playing with Lee while feedback was provided, then they went into the next coaching session smoothly. The coaching-feedback cycle was repeated until she mastered the strategy.

Conclusion

The current training package provides early intervention service providers with a rather brief procedure (about three 1-hour visits) for training caregivers to implement evidence-based language

support strategies which aligns with current service provision models for early intervention programs for young children with disabilities or who may be at-risk. This abbreviated training package can be used to support parents with disabilities by increasing the implementation of NDBIs in children's natural environments and allows for practical and measurable changes in both parental and child outcomes.

Although NDBI strategies are often effective with many students, there may be some limitations to using them as a parent or caregiver. First, an interventionist is necessary to explain, model, and provide feedback for a caregiver. However, once the caregiver is delivering the intervention, they are responsible for the correct implementation (fidelity) and for collecting any necessary data. This creates the possibility of bias, even if it is unintentional. Second, this process may be time consuming, costly, or confusing. A caregiver must have the resources, including time and potential money, to make sure that all interventions are adequately explained, modeled, and ultimately implemented correctly. Finally, some of these interventions may be difficult to implement with more than one individual at a time as they begin learning how to practice the strategies correctly.

Addressing the current standard of care for early intervention services, these interventions occur within a home-based setting and eliminate the task of teaching parents to generalize learned skills to a novel environment. Additionally, this training package increases time and cost effectiveness by using in-home natural settings and can be implemented by the caregivers as well. Furthermore, training caregivers to employ effective and evidence-based language interventions during routine-based activities in a home setting may increase the number of hours per week children receive meaningful intervention and interactions.

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