Developing Parents Plus
A Parent-Implemented Intervention for Young Children With Developmental Language Disorders

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In this article, we describe the development and investigation of the social validity of Parents Plus, a parent-implemented intervention for preschool children with developmental language disorder. Parents Plus is a fully online intervention that is delivered through three components: (a) training delivered through an app that educates parents on how to use focused stimulation (FS), a language facilitation strategy; (b) parent implementation of FS during naturally occurring routines; and (c) remote practice-based coaching provided by a coach via Zoom. Parents Plus was developed in three steps: (a) initial content development with input from parents and professional advisory board members, (b) brief field test with five parent–child dyads, and (c) full-length field test with seven parent–child dyads. Throughout the development process, we collected social validity data on the intervention's goals, procedures, content and outcomes. Each step was followed by revisions to Parents Plus. Findings suggest that Parents Plus has strong social validity. Recommendations for early intervention practice are provided based on lessons learned, such as different methods to scaffold learning experiences for parents. **Key words:** *developmental language disorder, intervention, preschool, social validity*

DEVELOPMENTAL LANGUAGE DISORDER (DLD) is the most common disability for preschool children. Approximately 75% of preschool children with

disabilities have a primary or secondary diagnosis of DLD (Hussar et al., 2020). Children with DLD have significant deficits in the comprehension and/or expression of language, which include but are not limited to difficulties in vocabulary, morphology, and syntax (Paul, 2017). Preschool children with DLD are at risk for later poor reading, math skills, and social emotional skills (e.g., Hammer et al., 2017). Furthermore, DLD in early childhood is related to long-term deleterious effects, including mental health problems and underemployment as adults (Law, Rush, Schoon, & Parsons, 2009). Thus, it is imperative that children with DLD receive high-quality speech and language services to promote their language development.

Preschool children with DLD almost universally receive speech–language services in the preschool setting (Markowitz, Strohl, & Klein, 2006). Unfortunately, due to large caseloads of speech–language pathologists (SLPs) and

other logistical issues that limit contact between SLPs and parents, parents are unlikely to receive sufficient education on how to promote their children's language development. Because children spend more time with their parents than their SLPs, lack of parent education results in fewer opportunities for children to develop their language skills. To fill the needs of educating parents and optimizing the home as an environment for children with DLD to receive individualized support, we developed Parents Plus.

Parents Plus is a fully online intervention to support English-speaking parents of preschool children with DLD that is delivered through three components: (a) training delivered through an app that educates parents how to use focused stimulation (FS), a language facilitation strategy; (b) parent implementation of FS during naturally occurring routines; and (c) remote practice-based coaching provided by a coach via Zoom. Parents Plus was iteratively developed in three steps with input from key stakeholders, namely parents of preschool children with DLD and early childhood interventionists (i.e., SLPs and early childhood special education teachers) who support young children with DLD. The aim of our initial development work was to create a socially valid parent-implemented intervention that parents found meaningful, feasible to use, and supported their children's language development. The purpose of this article is to describe the phases of development and report findings of the intervention's social validity.

EDUCATING PARENTS

Parents Plus was developed to provide additional opportunities for young children with DLD to develop language skills. Children with DLD require more intentional efforts to develop language skills than children who are typically developing (e.g., Paul, 2017). With specialized training, parents of children with DLD are able to effectively use language strategies to improve children's language outcomes (e.g., Hancock, Kaiser, & Delaney, 2002; Roberts, Curtis, Sone, & Hampton, 2019). In a meta-analysis of parent-implemented language interventions, Roberts and Kaiser (2011) compared language outcomes of children with DLD who received parent-implemented interventions to those in a control group and found effect sizes ranging from 0.35 to 0.82. Importantly, parent–child interventions make unique and positive contributions to child outcomes over and above the effects of clinician-implemented intervention (Yoder & Warren, 2001).

Parents Plus is grounded in social–constructivist theory (Bruner, 1978; Vygotsky, 1978) and Division for Early Childhood's (DEC, 2014) recommended family-centered practices. Based on social–constructivist theory, the child learns language (and other skills) through interactions with knowledgeable members of society (e.g., parents). The parent scaffolds the child's language learning by providing language input in the child's zone of proximal development. As the child develops linguistically, the parent provides more complex language models. In accordance with DEC's family-centered practices, Parents Plus aims to increase parents' capacity (i.e., knowledge and skills) to support their child's language development in natural settings.

SOCIAL VALIDITY

Social validity is a critical construct to consider when developing an intervention to be used in natural settings. When participants find the intervention to be socially valid, they are more likely to use the intervention as intended (e.g., Dunst, Raab, & Hamby, 2016; Leko, 2014). Originating with Wolf (1978), researchers typically consider three elements of social validity: (a) intervention goals are important, (b) procedures and content are acceptable, and (c) outcomes are meaningful (Larson et al., 2020; Ledford, Hall, Conder, & Lane, 2016; Leko, 2014; Strain, Barton, & Dunlap, 2012). Notably, DEC's (2014) recommended family-centered practices hinge on early interventionists (EIs) working with

families to ensure that services meet these tenets; for example, EIs should work collaboratively with families to build families' capacities in ways that are responsive to families' values (goals), beliefs, and practices.

Several literature reviews on special education interventions indicate that social validity data are typically only collected after the intervention is complete and most often with survey methodology (Ledford et al., 2016; Snodgrass, Chung, Meadan, & Halle, 2018). The collection of retrospective data only does not provide the opportunity to iteratively develop an intervention that meets users' needs. Social validity experts recommend collecting data before, during, and after the intervention and using multiple data sources (e.g., Larson et al., 2020; Ledford et al., 2016; Strain et al., 2012). Following recommended practices, we collected social validity data: (a) on stakeholders' and participants' perspectives of the goals, content and procedures, and outcomes; (b) before, during, and after intervention use; and (c) through both qualitative and quantitative methods. Specifically, we initially employed focus groups (in the form of advisory boards) with stakeholders to provide input on the framework of Parents Plus. In this vein, *before* intervention use, we collected social validity data on the proposed goals and content. We then conducted two field tests where we collected social validity data from participants *during* and *after* intervention use on the intervention's content, procedures, and outcomes. At each stage, findings were used to iteratively develop Parents Plus.

FRAMEWORK OF PARENTS PLUS

In developing the framework of Parents Plus, we considered three key components to heighten the intervention's social validity. First, we selected an evidence-based language facilitation strategy (e.g., Fey, Cleave, Long, & Hughes, 1993; Girolametto, Pearce, & Weitzman, 1996; Smith-Lock et al., 2013). Second, in accordance with DEC's family-centered practices, parents intervened with their children during parent-selected naturally occurring routines. Third, the intervention was delivered online so that parents could use Parents Plus at convenient times/locations.

Language facilitation strategy

We selected FS as the evidence-based language strategy to teach parents. In FS, the adult repeatedly models specific language targets to increase the likelihood that the child will express those specific language forms (Ellis-Weismer & Robertson, 2006). The child is given an opportunity (but not required) to produce the target, and the parent provides feedback based on whether the child used the language target. The adult is responsive to the child, using strategies such as maintaining joint attention and expanding upon/recasting the child's verbal attempts to enhance the child's language outcomes (e.g., Smith-Lock et al., 2013).

When clinicians and/or parents use FS with young children with DLD, children make significant gains in their language skills, specifically in the domains of vocabulary and morphosyntax (e.g., Fey et al., 1993; Girolametto et al., 1996; Smith-Lock et al., 2013). In a comparison of clinician- and parent-implemented FS, Fey et al. (1993) found that both groups of children improved in their morphosyntactic skills; notably, no significant differences between groups were found, indicating that parents implemented FS as well as clinicians.

Natural routines

Parents Plus centers on improving parent–child language interactions during families' naturally occurring routines, which aligns with DEC's (2014) recommendation that services are provided in the child's natural environments during daily activities and routines to facilitate children's participation and learning. Theoretical and empirical research emphasizes how routines can be used to enrich language. Theoretically, when children are engaged in a well-known verbal routine (e.g., conversation during the routine

of dressing), they use fewer cognitive resources to navigate the routine, which allows them to focus more on learning and using language (e.g., Nelson & Gruendel, 1979). In familiar routines, adults have a better understanding of what children are attempting to communicate and are more able to provide a scaffold in the zone of proximal development (Kim & Lombardino, 1991). Empirical work with both children who have disabilities and who are typically developing provides evidence that children demonstrate more complex language production and/or increased vocabulary when communicating in familiar routines (Nelson & Gruendel, 1979; Spagnola & Fiese, 2007). Also, from the parents' vantage point, by teaching parents how to embed learning opportunities into regularly occurring routines, parents are not asked to "add one more thing" to their day.

Mode of delivery

As another consideration of parents' time as well as the resources of early intervention programs, Parents Plus was fully delivered online. Although effective in improving children's language outcomes, many parent-implemented language interventions provide training in ways that are logistically challenging for families, such as frequent trainings that last multiple hours in community settings (e.g., Carter et al., 2011; Fey et al. 2006; Yoder & Warren, 2002), which can reduce their involvement. Heinrichs, Bertram, Kuschel, and Hahlweg (2005) found that 50% of parents typically attend half or less of sessions, especially when the training has seven or more sessions. As a more convenient alternative for parents, other interventions have primarily provided home-based training (e.g., Fey et al., 2006; O'Neil-Pirozzi, 2009; Yoder & Warren, 2002). Yet, these individual trainings are resource intensive (e.g., travel and scheduling time), which reduces scalability.

Delivering interventions via online training is a cost-effective, scalable, and widely accessible way to reach adults. Numerous researchers found success using online trainings to improve outcomes in parenting,

which in turn improved child outcomes (Baggett et al., 2010; DuPaul et al., 2018; Gilkerson, Richards, & Topping, 2017). Additionally, parent-implemented interventions for children with DLD are particularly needed during times when early intervention services are disrupted, such as during the COVID-19 pandemic (National Council on Disabilities, 2020).

In Parents Plus (further described in the procedures), parents are supported in two primary ways. First, they learn foundational content through completing core learning modules that they access through an app at convenient times. Second, parents receive remote coaching from an SLP that is delivered via Zoom that is designed to help them successfully apply the information that they learned in the modules to interactions with their child. Parents Plus employs practice-based coaching, which is a relationship-oriented approach that focuses on improving adults' teaching practices with children to promote children's positive development (Snyder, Hemmeter, & Fox, 2015). The coach and parent engage in a three-step cyclical process of jointly developing individualized plans for implementation, observing implementation, and reflecting on strengths and ways to improve practices. Numerous research studies have demonstrated that practice-based coaching is effective in improving the quality of adult–child interactions (e.g., Fox, Hemmeter, Snyder, Binder, & Clarke, 2011; Sheridan, Edwards, Marvin, & Knoche, 2009).

GOALS FOR INTERVENTION DEVELOPMENT

Our goal was to create a socially valid parent-implemented intervention that would promote the language skills, specifically vocabulary and morphosyntax, of preschool children with DLD. This article describes the three iterative steps that we undertook in the development process of Parents Plus, the feedback from parents and other key stakeholders about the intervention's social

validity, and the ensuing revisions to Parents Plus.

METHODS

We followed three steps to develop Parents Plus. First, we used an iterative approach to develop the training modules (that were entered into the app) with input from key stakeholders. Second, we conducted a brief 8-week field test of Parents Plus with five mother–child dyads and used the findings to revise content and procedures. Third, we conducted a full-length 14-week field test with seven mother–child dyads, which again resulted in revisions.

Step 1: Development of module content with stakeholder input

In this first step, we used an iterative development process. We developed an original version of learning modules for the app, gathered stakeholder input from parent and professional advisory boards, and revised modules based on their feedback.

Participants

Separate parent and professional advisory boards were formed because we thought parents may feel uncomfortable contributing their perspectives in front of professionals.

Parent advisory board

Seven mothers of preschool children with DLD served as advisory board members. The only inclusion criterion for participating was to be a parent of a preschool child with DLD. The majority of mothers were White/non-Latina ($n = 5$), one mother was Latina, and one mother was Black/African American. Mothers' highest level of educational attainment included high school diploma ($n = 1$), associate's degree ($n = 1$), bachelor's degree ($n = 2$), and master's degree ($n = 3$). All children received speech/language services at their preschool center. One child was female, and the remainder were male ($n = 6$), which aligns with statistics showing males are more prone to DLD than females (Maatta, Laakso, & Tolvanen, 2012).

Professional advisory board members

Eight EIs comprised the professional advisory board. The only inclusion criterion for participating was to be an EI who worked with a preschool child with DLD. Four EIs were SLPs, three were teachers (two lead, one assistant) in early childhood special education classrooms, and one was an EI program administrator. All EIs were female, and the majority were White/non-Latina ($n = 5$). Two EIs were Latina, and one was Asian. EIs' highest level of education was predominantly a master's degree ($n = 6$), with one individual each respectively having an associate's degree and bachelor's degree. EIs averaged 10.86 years of experience, with a range of 3–25 years.

Procedures

We recruited advisory board members through two EI county organizations. All professionals were from one organization, whereas parents were from two organizations (i.e., four from each). Due to geographic distance, we held parent advisory board meetings in two different locations. Each of the three advisory board groups met with the research team three times over a span of several months with each meeting lasting 2 hours. During the meetings, members provided feedback about Parents Plus's framework and the content/presentation of the learning modules.

Prior to meeting with the advisory boards, the research team developed initial versions of the learning modules. Based on our framework and in consultation with the literature, we first developed three learning modules: (a) an introduction to Parents Plus; (b) an overview of FS and explicit teaching of the three steps of FS—modeling, pausing for child response, and providing feedback; and (c) a discussion of how to use FS in natural routines. During this step, we also developed two additional learning modules based on early advisory board input (described later): (d) following the child's lead and (e) using

FS with challenging behavior. As such, we ultimately developed five learning modules to input into the app, with all modules undergoing several rounds of advisory board review.

We staggered meeting dates of the groups so that one advisory board group's feedback on an initial draft of a module was used to revise the module; then, the revised version was presented to the next advisory board group, and so forth with the third group. One week prior to the advisory board meeting, advisory board members were provided with a draft of the modules to review along with open-ended questions to guide their review (e.g., *What did you like? Was anything confusing? Do you have any suggestions?*). A research team member recorded detailed notes during each meeting. Notes were carefully reviewed by the team to determine strengths of the modules and revision suggestions.

Modules were written in easy-to-understand language. We designed the learning modules to have relatively little text on a page and routinely incorporated videos. According to Bandura's social cognitive theory (Bandura, 1977), individuals gain self-efficacy when they see someone similar to them having success (i.e., vicarious experiences). As such, we included short videos (range of approximately 15–90 s) of parents of preschool children with DLD explaining how their child's language delay/disorder impacted the child's functioning, demonstrating how to use FS in natural routines, and discussing what they considered when selecting routines in which to use FS. Text in the modules was supplemented with illustrations and varying font (e.g., capitals and bold) to draw parents' attention to key points in the learning modules. Modules were chunked into sessions to allow for maximal flexibility in how parents accessed the content; that is, if parents only had a short amount of time in any one sitting, natural stopping points in the modules existed. In conjunction with the fifth author, an app for Parents Plus was developed[1] on a content management system and modules were inputted into the app. The app was designed to provide users with full functionality while offline, which is essential for participants with slower connections or limited data access.

Results

Four lessons emerged based on input from multiple members of the advisory boards related. These lessons centered on the goals of the intervention as well as the content and presentation of the learning modules, and we used this feedback to refine the modules.

Lesson 1: Be more explicit about the goal of the intervention

Both parents and EIs valued the intervention goal of improving children's language skills; however, the advisory board members provided two suggestions to make the goal more explicit. First, parents commented that they had been repeatedly told by their children's EIs that language skills are important for their children's success, but they did not necessarily know why they were important. Both parents and EIs believed that if Parents Plus explained how language skills were related to children's academic or social–emotional skills, then prospective parents would be more interested and engaged in using the program. Several parents termed this as "providing buy-in."

Second, parents needed clarification about the difference between "speech" and "language," which they often used interchangeably. For example, one parent described her child as having trouble with "language" when strangers had a hard time understanding what her child was saying. Another parent said her child was getting "speech" therapy where the goal was to increase the number of words that her child was saying. Because Parents Plus focuses on language (i.e., vocabulary and

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[1] *Technical details of the app can be provided upon request from the authors.*

morphosyntax) and not speech, this was an important distinction to communicate so parents had the appropriate expectations about the intervention's goals.

Lesson 2: Present content with empathy

Parents encouraged us to think very carefully about the wording in the modules. First, they communicated that parents of children with disabilities are worried about their children's future but feel unsure about how to effectively help their children. Parents suggested that it would be comforting for the modules to explicitly state that Parents Plus is a partner to support parents. Second, parents indicated that it was reassuring when we recognized that FS implementation would not be perfect every time and indicated that strategies could be personalized to each family's context.

Lesson 3: Add content focused on child's behavior

Parents and EIs helped us more fully understand parents' concerns and challenges to implementing FS with their children in their daily lives. In an effort to not overload families with information, our initial learning modules only focused on how parents could use FS to support their child's language development. However, both parents and EIs indicated the need for prospective parents to learn more about how to effectively use FS in accordance with the child's behavior. Parents were concerned about how to do FS if their child was exhibiting challenging behavior. EIs encouraged us to provide content to help parents assess and respond to their child's interests.

Lesson 4: Create visual appeal in the learning modules

Both parents and EIs appreciated our design of the learning modules, which were visually appealing, including using graphics and videos. They expressed that parents would be prone to lose interest if they were expected to read long sections of text.

Revisions

Based on this advisory board input, we revised the modules in several ways. First, to more explicitly state the intervention goal (and gain buy-in), we added content to the introductory learning module that (a) focused on how early language skills are related to children's current and later academic achievement and social interactions and (b) clarified the differences between speech and language. Second, to present content with empathy, we included language throughout the modules that reassured parents and recognized family's priorities, strengths, and needs, as also suggested in DEC's (2014) recommended practices. For example, in the module on selecting routines for FS, we explicitly articulated that families will select different routines based on what they find to be enjoyable. We also highlighted that variations in implementation are natural and that their coach will help them work through any persistent issues, which also served to remind parents that Parents Plus is a resource to support them. Third, as mentioned earlier, two additional modules related to behavior were developed and discussed with the advisory boards. The module entitled "Follow Your Child's Lead" focused on teaching parents how to use their child's interests to engage their child in FS. The module entitled "FS and Challenging Behavior" described various ways that parents could respond when their child refused to do FS and reinforced the idea that the coach was the parent's partner in determining how to use FS with their child. In regard to content presentation, parents and EIs were pleased with our presentation, so no changes were required.

Step 2: Initial Field Test

The second step was to conduct an initial field test of the social validity of the Parents Plus program. In this phase, we conducted a brief trial of the implementation/coaching components (4 weeks) to ensure participants found the procedures acceptable before we launched a full-length trial.

Participants

Five mother–child dyads participated in the initial field test. Eligibility criteria included dyads having a preschool child with DLD and who did not have severe cognitive or sensory delays or significant phonological disorders. All children had a diagnosis of DLD and were receiving speech and language services from their local EI provider. Additionally, one child was diagnosed with developmental delay and another with attention-deficit hyperactivity disorder. Children's mean age was 56.40 months (*SD*: 6.19 months). All children were male. All children attended early childhood education programs. Children attended 13.20 hr per week, on average (*SD*: 7.23 hr). Two mothers were White, and three were Black/African American; children's racial identities were the same as the mothers. Mothers' highest level of educational attainment varied: some college/no degree (*n* = 1), associate's degree (*n* = 1), bachelor's degree (*n* = 1), and master's degree (*n* = 2). Four mothers worked outside the home. Four families reported moderate to high income (>$75,000/year), and one family reported low income (between $20,000 and $30,000/year). Four of the five dyads completed the field test. One dyad completed the app training but withdrew after 1 week of implementation/coaching due to a significant employment change that resulted in her not seeing her child for extended periods.

Procedures

One coach served all participating mother–child dyads. The Parents Plus coach was an SLP who had extensive experience working with preschool children and their parents. The coach used a practice-based coaching model (described previously). Prior to the first field test, the coach and first two authors developed a detailed coaching manual that had step-by-step procedures for each parent–coach meeting. Additionally, the coach and first two authors met weekly to discuss coaching procedures.

Parents completed the five learning modules (that were developed in Step 1) on the app. Participants accessed the app on study-provided iPads. After a parent completed each module (typically one module per week), the parent and coach remotely met to review the module's learning objectives and discuss any parental questions or concerns about the module's content. Meetings typically lasted 15 min.

After parents completed all five learning modules, parents implemented FS for four weeks with their children using individualized language targets. Parents were provided weekly practice-based coaching to support their implementation. During FS, parents targeted a total of nine vocabulary words and three morphosyntactic forms for a total of 12 targets per child. In consultation with the children's preschool SLP, the coach and parent jointly determined these targets based on the child's individual needs (i.e., assessment results) and contexts (i.e., routines selected by the parent). Children's nine vocabulary words were tier two vocabulary words that represented general academic language and could be easily embedded into the activities/ routines selected by the parents (Beck, McKeown, & Kucan, 2013), such as accident, rescue, and repair for a child who enjoyed playing with toy cars/trucks. Children's morphosyntactic targets were three of the following common areas of difficulty for preschool children with DLD: regular past tense verbs, third-person singular verbs, copula be verbs, auxiliary be verbs, and third-person subjective pronouns (Leonard, 2014).

In this initial test, parents completed one cycle of FS implementation with practice-based coaching. Parents used a cyclical approach for working on targets similar to Cleave and Fey's (1997) procedure. Each week, parents implemented FS with one set of vocabulary targets (i.e., three words) and one morphosyntactic target, so that all nine vocabulary and three morphosyntactic targets were covered in one cycle, or 3-week period. We extended the cycle to 4 weeks to provide parents with a prolonged opportunity to practice FS; at the start of implementation, parents spent 2 weeks on

the first set of targets before spending 1 week on sets two and three, respectively.

The Parents Plus coach and parents met each week over Zoom (typical length: 60 min) and engaged in the practice-based coaching multistep process of jointly developing individualized plans for implementation, observing implementation, and reflecting on strengths and ways to improve practices. In the first coaching session, the coach and parents worked together to create individualized implementation plans for how parents were to use FS to target that week's set of three vocabulary words and the morphosyntactic form within the parent-selected routines. Plans included what materials were needed, what parents would say to model the targets, what children's anticipated verbal/nonverbal responses would be, and how parents would give feedback (i.e., apply FS steps to the specific routines selected by the parent). For instance, the coach provided different soft-scripted examples of how to model the targets (e.g., *During bath time, to model helping verbs, you could say things like, "The boat is floating. The boat is floating on the water. Oh no! The boat is sinking."*).

In the remaining weekly coaching sessions, the coach and parents would (a) review the parents' FS implementation and (b) plan for FS implementation for the following week. Each week, parents recorded two FS interactions with their children, one focused on vocabulary and the other on morphosyntax. Parents recorded videos on the study-provided iPad and uploaded them into the app. Prior to the coaching session, the coach independently reviewed the two FS videos and inserted comments that highlighted the strengths of parent–child interactions as well as areas to improve. The coach targeted one specific FS behavior to improve or enhance per week (e.g., pace of modeling), so as not to overtax parents' cognitive load (Sweller, Van Merrienboer, & Paas, 1998). During the coaching session, the coach and parents jointly reflected on how to enhance parents' FS implementation. The

coach and parents reviewed the annotated videos to discuss strengths and one specific area to improve. As the coach and parents reviewed the video clip, the coach would pause the video to (a) provide positive reinforcement of parents' correct FS strategies and (b) corrective or elaborative feedback of what the parent could do differently to improve or enhance the select practice to ensure that the parent was effectively scaffolding the child. Parents asked questions and discussed implementation challenges, which the coach would help trouble-shoot. At the end of each session, they developed an implementation plan for the next week.

Measures

We collected social validity data using three measures. The first two measures were collected during the intervention. First, parents answered multiple-choice questions that were embedded into the learning modules about the content and presentation of the learning modules. These questions were asked at the end of each session (i.e., smaller unit of module). For instance, parents responded to questions about whether the information presented was helpful, easy to understand, and presented in an enjoyable manner. Questions were multiple choice (e.g., *The information presented in this session was not/somewhat/very helpful*) to minimize participant fatigue (Strain et al., 2012), although participants had the opportunity to provide an explanation or additional information if desired.

Second, during the coach's weekly meetings with parents during the FS implementation/coaching phase, the coach asked questions about parents' satisfaction with using FS with their children (acceptability of procedures) as well as whether the parents saw any meaningful change in their child's language skills (outcomes). Questions were predominantly multiple choice, with opportunities for parents to elaborate on any of responses (e.g., how comfortable parents were using FS with response options of *not*

comfortable, somewhat comfortable, and *comfortable*).

The third measure was an end-of-intervention survey; parents completed a 31-item survey on the acceptability of the procedures and perceived outcomes for parents and children. Examples of procedural items included satisfaction with learning through the app, relationship with coach, amount of time spent on Parents Plus, and overall level of enjoyment of the program. Examples of perceived outcomes included parents' ratings of their confidence in supporting their children's language development and the degree to which they thought Parents Plus helped their children's language skills. The majority of questions were structured in a multiple-choice fashion with opportunities for parents to elaborate as desired.

In order to triangulate parents' reports of the social validity of the content, we also included comprehension checks in the app's learning modules to determine the degree to which the parent understood the presented content. If parents commonly answered a question incorrectly, this pattern would provide evidence that the app content needed revision. After each session (shorter segment of a module), parents answered two to three true/false or multiple-choice questions on the key concepts presented in the session (e.g., true/false: *focused stimulation has three steps that repeat*). In total, parents answered 24 comprehension check questions.

Results

Parents' perceptions of the social validity of Parents Plus are shown in Table 1 (during intervention as measured by embedded app questions and coach-facilitated questionnaires) and Table 2 (after intervention as measured by the survey). On the embedded in-app questions (Table 1), parents almost universally reported that the information in the learning modules was very helpful, easy to understand, enjoyable, and could be completed in a satisfactory amount of time. Occasionally, a parent reported that a singular session of a module could be ad-justed. For instance, one parent noted that a session in the welcome module was only somewhat enjoyable. Parent self-report data were corroborated by comprehension checks to determine whether parents were understanding the content. On average, parents answered 95.2% of items correctly.

On the weekly check-in questionnaire (Table 1), parents reported that they used FS at least two times per week, with parents often using FS 6–7 days per week (70.6%). Parents found their weekly routines were a good fit for FS implementation (75%). Parents' comfort using FS ranged from somewhat comfortable to comfortable. In regard to outcomes, parents reported that children were regularly producing the language targets a few times after the parent modeled (86.7% grammar [note: grammar was used instead of morphosyntax because grammar is a more familiar term to parents]; 93.3% vocabulary).

After the intervention ended, three of the five parents (60%) completed the survey at the end-of-intervention survey (Table 2). Parents were unanimous in their satisfaction with Parents Plus procedures (both app and coaching experiences) and the overall program. For example, the three parents were very comfortable with their coach who they found to be a valuable source of information. All parents enjoyed using Parents Plus and would recommend it to other parents. All parents also reported feeling much more confident in supporting their children's language skills, which was a desired outcome of the intervention. The social validity perceptions of children's outcomes were more tempered. All three parents reported that Parents Plus helped their children's language skills a little (rather than a lot), which was not surprising given that parents implemented FS for only 4 weeks.

Revisions

Because all five parents were almost universal in their satisfaction with the learning modules (no learning module session received even a minor critique by more than one parent), no changes were made to the five learning modules. Based on the

Table 1. Parents' Perceptions of Parents Plus Social Validity: Data Collected During Intervention

	Field Test 1 (%) n = 5	Field Test 1 (%) n = 7	Both Field Tests (%) n = 12
App modules: acceptability of procedures/content			
Information was helpful[a]			
Somewhat	—	2.4	1.4
Very	100	97.6	98.6
Information easy to understand[a]			
Somewhat	3.3	—	1.4
Very	96.7	100	98.6
Information presented in enjoyable manner[a]			
Somewhat	6.6	—	2.8
Very	93.4	100	97.2
Amount of time to complete[a]			
Little long	3.3	—	1.4
Okay	96.7	100	98.6
FS implementation: acceptability of procedures			
Weekly frequency of FS implementation[a]			
2–3 days/week	5.9	13.1	11.5
4–5 days/week	23.5	65.6	56.4
6–7 days/week	70.6	21.3	32.1
Comfort using FS			
Uncomfortable	0	1.6	1.3
Somewhat comfortable	41.2	26.2	29.5
Comfortable	58.8	72.1	69.2
Fit of using FS in family-selected routine			
Not a fit	0	6.7	5.3
Okay fit	25.0	13.3	15.8
Good fit	75.0	80.0	78.9
FS implementation: outcomes			
Parent's report on child's use of grammar language targets during FS routine[a]			
Did not use	6.7	12.9	11.7
Used once	6.7	9.7	9.1
Used a few times	86.7	77.4	79.2
Parent's report on child's use of vocabulary language target during FS routine			
Did not use	0	19.3	15.3
Used once	6.7	15.8	13.9
Used a few times	93.3	61.4	68.1
Used every time	0	3.5	2.8

Note. FS = focused stimulation.
[a]Because of space constraints, response options that parents never recorded are omitted from the table.

information provided by the four parents who implemented FS for the 4 weeks, we developed three new learning modules to increase parents' comfort using FS in their routines, which were: (a) how to use FS when targeting vocabulary, (b) how to use FS when targeting grammar, and (c) how to use FS during book-reading routines. Thus, the app ultimately contained eight learning modules.

Step 3: Second field test

The third step was to conduct a second field test. The purpose was to collect social

Table 2. Parents' Perceptions of Parents Plus Social Validity: Data Collected After Intervention

	Field Test 1 (%) n = 3	Field Test 2 (%) n = 7	Both Field Tests (%) n = 10
App (procedures)			
Enjoyed learning through app[a]	100	100	100
Coaching (Content and procedures)			
Provided a lot of helpful information[a]	100	100	100
Very comfortable with coach[a]	100	100	100
Coaching over Zoom was easy[a]	100	100	100
Overall program (content and procedures)			
Very much enjoyed Parents Plus[a]	100	100	100
Amount of time for program was just right[a]	100	100	100
Definitely recommend Parents Plus to other parents[a]	100	100	100
Definitely continue to use FS[a]	100	100	100
Overall program (outcomes)			
Much more confident to support child's language[a]	100	100	100
Helped my child's language skills[a]			
A little	100	29	50
A lot	—	71	50

Note. FS = focused stimulation.
[a]Because of space constraints, response options that parents never recorded are omitted from the table.

validity data on the full-length Parents Plus program (i.e., app training, FS use, and coaching).

Participants

Seven mother–child dyads enrolled in the second field test. Inclusion criteria were the same as in the first field test. All children had diagnoses of DLD and were receiving speech and language services from their local early intervention provider. Additionally, one child was diagnosed with developmental delay, and another child was diagnosed with developmental delay, specific learning disability, autism spectrum disorder, and other health impairment. Children's mean age was 51.29 months (*SD*: 8.32 months). Five children were male, and two were female. Six children attended early childhood education programs, averaging 23.83 hr per week (*SD*: 12.30 hr), and received their EI services at their preschool program. One child

did not attend preschool. However, he still received his EI services in the preschool program. Three mothers and their children were White/non-Latina, and four were Latina. This cohort of mothers' educational attainment level was lower than the first cohort. Three mothers reported some college/no degree, two mothers held an associate's degree, and one mother each held a bachelor's degree and a master's degree. Six mothers worked outside the home, and family income ranged from $10,000–$20,000/year to more than $150,000/year. Median income was $60,000–$75,000/year.

Of the seven dyads who enrolled in the second field test, five fully completed the app and the implementation/coaching. The remaining two parent–child dyads completed the app training but did not fully complete the 10-week implementation/coaching component due to medical issues; they completed 5 and 7 weeks, respectively.

Procedures

Parents Plus procedures were the same as in the first field trial, with three notable exceptions. First, FS implementation and coaching was extended to 10 full weeks, whereby parents completed three cycles of implementation of the vocabulary and morphosyntactic targets rather than only one cycle that occurred in the first trial. Second, all parents completed the three new learning modules designed to support FS implementation: (a) how to use FS when targeting vocabulary, (b) how to use FS when targeting grammar, and (c) how to use FS during book-reading routines. Third, the two behavior-related learning modules (i.e., following the child's lead and how to use FS when the child displays challenging behavior) were made optional; this decision was based on recommendations by Ledford et al. (2016), who asserted that providing a choice is a way to increase an intervention's social validity. Although parents rated these modules favorably in the first trial, the coach noted to the research team that not every parent needed the content in these modules. Thus, parents only completed a supplemental behavior-related module if the parent communicated that she was having trouble implementing FS due to her child's behavior or if the coach noticed this need when reviewing the parents' FS videos. Three parents completed the following child's lead module, and two parents completed the challenging behavior module. Thus, in total, parents completed between 6 and 8 modules.

Measures

The measures were the same as in the first field test.

Results

On the embedded in-app questions (Table 1), parents universally reported that the learning module content was easy to understand, enjoyable, and could be completed in a satisfactory amount of time. One parent reported that the information in the challenging behavior module was somewhat helpful, but otherwise, parents found the content very helpful. Again, parent self-report data were corroborated by the embedded comprehension checks that showed that parents answered 93.7% of items correctly, on average. Also, as shown in Table 1, parents reported regular FS implementation during their weekly meetings with the coach. Parents reported that they always implemented FS at least two times per week. Parents most often reported doing FS 4–5 days/week (65.6%) and occasionally 6–7 days/week (21.3%). Parents often found their routines to be a good fit (80%). Parents' comfort using FS ranged from uncomfortable (1.6%) to comfortable (72.1%). In regard to outcomes, parents regularly reported that children were using the language targets at least a few times after the parent modeled (77.4% for grammar and 64.9% for vocabulary), although these figures were lower than in the first trial.

Consistent with the first field test results, survey data collected at the end of intervention (Table 2) document that all parents were unanimous in their satisfaction with Parents Plus procedures. All parents enjoyed learning through the app and were positive about their coaching relationship. All parents reported positive perceptions of the overall Parents Plus program and would recommend it to other parents. All parents reported feeling much more confident in supporting their children's language skills. Further, the majority of parents (71%) reported that Parents Plus helped their children's language skills a lot, which was an expected increase from the first field test since FS implementation occurred for 6 additional weeks.

Revisions

Given the positive social validity results, no revisions to the content or procedures were made. We created a supplemental video library based on the coach's input that additional exemplar videos would be helpful to use in coaching sessions. Short exemplar video examples of FS implementation from this second cohort of parents were developed. These videos will be used in the

subsequent randomized controlled trial of Parents Plus.

DISCUSSION

Because parents are children's natural communication partners, it is critical to educate them on how to support the language development of their children, particularly when their children experience language delays. A substantial amount of research shows that when parents are educated about how to work with their children, their children's skills improve (e.g., Roberts et al., 2019). Also, children who receive intervention from both professionals and parents show greater skill development than children who only receive professional services (e.g., Yoder & Warren, 2001). Yet, many parent trainings are logistically challenging for parents or resource intensive for early intervention programs. Parents Plus was developed to provide a sustainable and scalable method to educate parents of preschool children with DLD. Our three-step iterative development process resulted in an intervention that has strong social validity.

In alignment with DEC's (2014) recommended practices, we based our initial framework on teaching parents to promote their children's language during natural activities and routines. Further, we used practice-based coaching to build a family's capacity through collaborative relationships with professionals. As recommended by social validity experts, we collected social validity data in numerous ways and throughout the development process (e.g., Larson et al., 2020; Ledford et al., 2016).

Qualitative data on the goals and content of Parents Plus were collected during the initial development process and prior to participant use of the program. Parent and professional advisory board members provided helpful suggestions; for example, they encouraged us to explicitly articulate the goals of the intervention and include content that met the day-to-day reality of families, such as how to use FS in ways that match children's behavior. Data collected during and after the intervention, which were parent self-report and primarily quantitative in nature, revealed that parents in the field tests ($n = 12$) found the content and procedures very informative, helpful, and feasible to use. Parents reported positive perceptions of both the learning modules and the practice-based coaching. In regard to outcomes, parents unanimously reported that the program increased their confidence in supporting their child's language skills. To a somewhat lesser but still positive degree, parents reported improvements in their children's language skills. Although we recognize that only a small number of parents participated in the field tests, a strength is the sample was diverse in terms of parent race/ethnicity, education, and income, indicating the potential for strong external reliability. These positive results are slightly tempered by the fact that three of the 12 dyads were not able to fully complete the FS implementation and coaching components. However, the dyads did not complete due to personal circumstances and still expressed enjoyment and value in Parents Plus.

Limitations and future directions

Several limitations require mention. First, as previously noted, the sample was small as well as drawn from one geographic region. Second, we employed one coach. Thus, the positive reactions from parents may be specific to the skill of this one individual rather than to the general coaching framework. We also did not collect coaching fidelity data to ensure the degree to which the coach was following procedures with fidelity. However, given that the coach was integral to the development of the coaching manual as well as all dyads being paired with the same coach, it is likely that families received consistent high-quality coaching. Third, while we did collect data on the three elements of social validity throughout the project, other methods would have enriched our knowledge. For example, all of our data were parent reported (or professional in regard to advisory board members). Although we repeatedly

communicated that we desired their honest feedback in order to improve the program for future users, parents still may have been reluctant to share negative opinions or to alert their coach in their weekly meetings that Parents Plus was not meeting their needs. We also relied heavily on surveys that used rating scales in order to reduce participant fatigue (Strain et al., 2012) and concentrated on parents' perceptions of content and procedures.

The next step in our intervention development is to conduct a small randomized controlled trial where we will examine the degree to which Parents Plus improves children's language outcomes as well as examine the degree to which parents can use FS with fidelity. In this way, we will collect additional social validity data using different sources, namely whether Parents Plus produces meaningful outcomes for both parents (i.e., observations of fidelity of implementation) and children (i.e., direct assessments to determine changes in language skills). We will also collect observational data on the coach's fidelity of implementation.

Implications for practice

Professional preparation standards emphasize the importance of developing strong provider–caregiver collaborative relationships to develop caregivers' knowledge and skills to promote children's positive development (e.g., DEC, 2014). However, the fact that the majority of preschool-aged children receive services in a center context creates significant challenges for EIs to connect with and support families. We envision that Parents Plus, once fully tested, would be a resource that SLPs who are employed in school or clinic settings can use to support parents' interactions with their children. The learning modules would be readily available to parents through the app; parents would only need a device (phone, tablet, and computer) on which to access the app. The Parents Plus coach could be the child's SLP. A detailed coach's manual provides soft-scripted step-by-step directions of how to implement the practice-based coaching model along with

any relevant forms (e.g., implementation plan).

In the short-term, we learned numerous lessons from parents that EIs can implement immediately. We designed Parents Plus to be an online program to avoid the logistical barriers that many EIs confront in being able to meet face to face with the parents on their caseloads. The coach would check in with parents through video meetings, messaging (texting or emailing), and phone calls to see whether the parent was finding the information helpful and understandable. Parents found this regular communication built a collaborative relationship with their coach where parents felt secure to share their successes as well as their concerns. We recommend that EIs use technology that is accessible to parents to do frequent, quick check-ins with parents.

When EIs recommend practices to parents, it is important to ensure that parents understand what those practices should look like when they use them with their children. In Parents Plus, we scaffolded parents' knowledge and skills in three primary ways that EIs could also employ. First, we provided brief video examples of strategies (range of approximately 15–90 s) to demonstrate how to use a strategy. EIs could record short video demonstrations of their use of strategies during sessions and email/text those to caregivers. Second, parents found it helpful when new information was provided in "bite-sized pieces." For instance, at the onset of FS implementation, we coached parents to only focus on one step of FS (e.g., modeling); once parents became comfortable with this step, the coach would then focus the parents' attention on the next FS step. Thus, EIs can think about how to break down the strategies that they are suggesting to parents into smaller practices in order to scaffold parents' implementation. Third, the coach and parent worked together to develop an implementation plan, including a list of needed materials and soft-scripting of parent language. EIs could easily include these types of directions to parents in a "try this at home" note. Although these scaffolding strategies

will likely require more thought and time to initially develop than may be found in typical practice, we believe that this will be time well spent because all parents indicated that Parents Plus helped them gain confidence in their abilities to help their children, which is a primary goal of family-centered services.

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