ADAPTATION AND EVALUATION OF THE FAMILY BEHAVIOR SUPPORT APPLICATION (FBSAPP) PAIRED WITH COLLABORATIVE COACHING FOR SPANISH-SPEAKING FAMILIES

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Adaptation and Evaluation of the Family Behavior Support application (FBSApp) Paired with Collaborative Coaching for Spanish-Speaking Families

Challenging behaviors (CB) demonstrated by young children can be a major concern for families, especially those with children with disabilities. Clinically significant forms of CB can occur in 48-60% of children with intellectual disabilities and up to 90% of young children with autism spectrum disorder (ASD; Simó-Pinatella et al., 2019). Addressing CB in the early childhood years is crucial because these behaviors tend to persist and worsen if left unaddressed (Dunlap et al., 2006). With the increasing prevalence of ASD worldwide (Chiarotti & Venerosi, 2020), effective interventions that target CB in early childhood will continue to become increasingly important.

Early intervention using research-based practices can improve outcomes for children with CB and co-occurring disabilities, including ASD (Rogers & Vismara, 2014). A key component of effective early intervention practices is a strong emphasis on working with the family to maximize the time caregivers spend with their child. By collaborating with the family, interventionists can leverage the powerful and lasting influence families have on a child's development (Dempsey & Keen, 2008). Family-centered interventions also maximize the time caregivers spend with their child by providing support to families in naturally-occurring settings and routines (Fixsen et al., 2005).

Such family-centered intervention practices are supported both by professional organizations and numerous published studies. The Council for Exceptional Children's Division of Early Childhood (DEC) recommends including family members in behavioral assessment and intervention procedures to promote positive outcomes (2014). Caregivers have been taught to implement evidence-based intervention strategies with high levels of fidelity when effective supports are provided, leading to improved outcomes for both children and families (Carr & Durand, 1985; Fettig & Barton, 2014; Gerow et al., 2018; Meadan et al., 2016).

Need for Effective and Efficient Supports in Naturally-Occurring Environments

Though in-home services and supports are considered an ideal mode for family-centered interventions, they are often time- and resource-intensive for providers. Such services can be especially limited for families in rural communities or families experiencing poverty or homelessness (Kasprzak et al., 2012; Meadan et al., 2013; Staerkel & Spieker, 2006). One effective and accessible alternative to in-home, in-person services involves caregiver coaching programs delivered via telehealth (Çelik et al., 2022; Meadan et al., 2016). Telehealth models enable practitioners to involve caregivers and other familiar adults to intervene on behavior directly in the environment in which it occurs.

Given recent technological advances, such telehealth interventions are becoming increasingly accessible. Technological access has been steadily increasing in recent decades, with the vast majority of American households now owning a computer (including smartphones) and having internet access (U.S. Department of Commerce, 2020). There is increasing support for telehealth service delivery for families of young children with disabilities and delays. Especially in the years since the COVID-19 pandemic, research on the use of telehealth models for caregiver coaching is growing. Such coaching has been demonstrated to be effective for increasing caregivers' use of positive behavior support strategies (Barton et al., in review; Winchester et al., in review), Enhanced Milieu Teaching strategies (Bailey et al., in preparation; Rodgers et al., in preparation), naturalistic communication teaching strategies (Meadan et al., 2016), and caregiver responsiveness and sensitivity (Çelik et al., 2022). Caregivers have also reported feeling less isolated and more supported (McDevitt, 2021), and more confident in their ability to interact with their child (Meadan et al., 2016).

While these models can greatly improve access to services, researchers have also identified barriers to effective caregiver coaching via telehealth. These barriers include a lack of familiarity and

fluency with the technology, difficulty building rapport and maintaining communication with caregivers in a virtual environment, and difficulty maximizing caregiver engagement with coaching materials and resources (Shelden et al., 2021). Further research is needed to identify methods for effective telehealth service delivery that are engaging and accessible to caregivers while maximizing positive outcomes for children and families.

Need for Culturally Adapted Interventions for Spanish-Speaking Families

Most early intervention and behavioral research, including research on parent training and telehealth models, has been conducted with White, middle- to upper-class, English-speaking children and families (Buzhardt et al., 2016; DuBay et al., 2017). Interventions that are validated with such populations may not be as effective or appropriate for culturally- and linguistically-diverse families (Bernal & Domenech Rodriguez, 2009, 2012; Buzhardt et al., 2016; Smith et al., 2011). Further, researchers have documented patterns of problematic practices when analyzing early interventionists' partnerships with culturally and linguistically diverse families, including professionals' unawareness of their own biases, and conflicting beliefs about appropriate goals and parental roles (Harry, 2008). Particularly problematic is the tendency toward deficit views of families, wherein potential risk factors (e.g., poverty, family structure, maternal education level) are automatically assumed to be deficits; this thinking can lead to broad generalizations about a family's competence, which can negatively influence the partnership (Harry & Klingner, 2006).

Culturally and linguistically diverse families constitute a growing portion of the U.S. population. There has been a 23% increase in the Hispanic/Latino population in the last ten years, to a total of 62.1 million individuals in 2020. Of this population, 71.1% speak a language other than English at home (Jones et al., 2021). Given that child-rearing practices, communication styles, and familial relationships are nuanced both within and across cultures, family-centered behavioral interventions should be uniquely tailored according to what is optimal for individual families. Such individualization should be based on evidence-based, culturally responsive practice applied to the families' strengths, values, and priorities (DEC, 2014; Wang & Lam, 2017). There is a crucial need for family-centered interventions that have been adapted for and evaluated with Spanish-speaking populations.

Models and Recommendations for Cultural Adaptation

Notably, there is a growing body of research exploring the cultural adaptation of existing parent or caregiver coaching interventions for Spanish-speaking families of young children with disabilities or delays. Calzada and colleagues (2010) hypothesized that an emphasis on obedience and prosocial behavior (i.e., *respeto*; Gonzales-Ramos et al., 1998) might be distinctly characteristic of Latino cultures in comparison to the emphasis placed on autonomy characteristic of mainstream U.S. American culture. Authors encouraged future researchers and practitioners to incorporate messages related to core cultural values such as *respeto* into educational, mental, and behavioral health treatments for Latino families (Calzada et al., 2010).

Similar calls have been made to incorporate cultural values of *familismo* (i.e., close identification and attachment to nuclear and extended family; Perez & Fox, 2008) and *personalismo* (i.e., high value placed on close personal relationships with open communication and trust; Magaña et al., 2020; Martinez-Torres et al., 2021). For example, relationship-building and collaborative engagement with parents and other caregivers have been identified as key components of family-centered practice for interventions targeting Latino youth and families (Chlebowski et al., 2018). DuBay and colleagues emphasized the need to teach direct strategies to parents, and recommended that clinicians working with Latino families discuss potential adaptations openly with families before implementation (2022).

One way to apply such adaptations is a conceptual model called the Cultural Adaptation Process model (Domenech-Rodriguez et al., 2004). In this process, multiple key individuals work together in

collaboration with the target community to extend an existing intervention to a new population. One individual, known as the Change Agent (CA), spearheads the process of diffusing the intervention. This person is often a professional with a high degree of technical expertise with the intervention (e.g., the person who originally developed the tool). The CA is supported by an Opinion Leader (OL), who is a well-known, respected community member who models and supports the use of the intervention within the target community. Together, these individuals collaborate with the target community to tailor, test, and revise the intervention to extend to new populations.

The Cultural Adaptation Process model was designed to be used in conjunction with Bernal and colleagues' Ecological Validity Model (1995). The Ecological Validity Model presents eight dimensions of treatment: language, persons, metaphors, content, concepts, goals, methods, and context. These are often reduced to five key dimensions, which will be the areas of focus for this study (language, persons, content, methods, and context; Domenech Rodriguez et al., 2011). For example, we considered linguistic adaptations beyond translating into Spanish per se, but also in terms of exact word choices and readability of all terms and phrases. Similarly, person adaptations related to "matching" the coaches' culture to that of the individual family. Adaptations relating to context related to the involvement of extended family members (*familismo*) and values (i.e., *respeto, personalismo*) often held by Hispanic families. More generally, the model is a cultural framework designed to provide structure for adaptations to existing psychosocial interventions for Hispanic/Latino populations. The framework is oriented toward strengthening the ecological validity of interventions used in clinical and research settings.

Together, these models provide strong theoretical guidance for our study, and for cultural adaptation work in general. However, there are very few published studies in which these models have been applied to telehealth interventions targeting CB for Spanish-speaking families of young children. Most cultural adaptations of telehealth caregiver coaching have centered around language interventions (e.g., Harbin & Fettig, 2022; Meadan et al., 2016). Buzhardt and colleagues (2016) described a framework for translating and adapting an existing intervention combining web-based instruction with live coaching and feedback to help parents manage CB with their child with ASD. However, the authors did not include an examination of the effects of the intervention with families, or evidence to support the feasibility or usability of the program. McIntyre and colleagues (2021) conducted a pilot study in which they examined the effects of the Incredible Years Parent Training Program delivered via telehealth for Spanish-speaking families of young children with developmental delays. This pilot study did not include any cultural adaptations to the content or procedures.

Finally, it is worth noting that parent engagement and participation in psychosocial interventions for children, including those with ASD, has been documented to be lower for Hispanic/Latino families (Lau & Brookman-Frazee, 2016). This reduction in participation can manifest as higher no-show rates and disengaged behaviors during sessions. Given that parent involvement has been identified as a barrier to effective telehealth service delivery irrespective of racial/ethnic background, more work is needed to apply and evaluate suggested methods of adapting telehealth caregiver coaching for Spanish-speaking families to maximize caregiver involvement, caregiver satisfaction, and thus, positive child and family outcomes. There is a persistent need to refine methods for implementing a collaborative, family-centered approach to coaching Spanish-speaking caregivers to address their child's CB via telehealth.

Current Study

The Family Behavior Support application (FBSApp; Barton, 2022) is an early intervention tool designed to support caregivers in implementing research-backed, function-based intervention strategies with their young children with CB in home settings. The FBSApp guides caregivers through the process of collecting data on their child's behavior and the circumstances surrounding it (i.e., antecedents, consequences, context). Caregivers can access evidence-based, universally-supportive strategies as soon

as they download the application. After navigating through these supports and inputting data, the app generates an individualized behavior support plan (BSP) based upon the hypothesized function of the child's behavior. The app also contains how-to videos and infographics, progress monitoring pages, and a platform for collaborating with professionals (e.g., messaging, sharing data) to support families as they address their children's use of CB and support healthy social-emotional development at home.

Importantly, the FBSApp is designed to be used in collaboration with an early childhood support professional, such as an early interventionist or behavior therapist, to strengthen and simplify collaboration between parties and maximize support to the family in natural contexts. The FBSApp allows families freedom in when and how they access evidence-based resources that are directly relevant to the circumstances surrounding their child's behavior; support professionals can also use these resources to guide their coaching and data collection. The app provides a family-centered, function-based framework for families and professionals to follow to address young childrens' use of CB in a variety of contexts.

Group and single-case experimental research conducted over the last six years (Barton et al., in review; Baum et al., in review; Todt et al., in press; Winchester et al., in review) supports the use of the FBSApp, with and without telehealth coaching, to increase caregivers' use of targeted intervention strategies and to reduce young children's use of CB. This research was conducted with a diverse group of participants (e.g., typically-developing children and those with ASD, developmental delay, post-traumatic stress disorder; varied ethnicity/race; varied socio-economic status) but all families were English-speaking U.S. citizens. Researchers have demonstrated that culturally adapted treatments are more effective (Smith et al., 2011) and preferable (DuBay et al., 2022) to non-adapted treatments. As such, the purpose of this study was to explore the necessary adaptations needed to expand the app from its current state, such that it retains efficacy and feasibility when utilized by Spanish-speaking families.

Research Questions

(1) What do stakeholders report to be the necessary adaptations that maintain the efficacy and usability of the Family Behavior Support application when translated to Spanish?
(2) What are stakeholders' perspectives on the FBSApp Español paired with collaborative coaching? How do they report the usability, feasibility, effectiveness, and cultural responsiveness?
(3) Does the use of the FBSApp Español paired with collaborative coaching result in an increase in caregivers' use of targeted intervention strategies in home settings with their young children with or at-risk for disabilities and CB?
(4) Does the use of the FBSApp Español paired with collaborative coaching result in a decrease in CB demonstrated by young children with or at-risk for disabilities in home settings?
(5) Does the use of the FBSApp Español paired with collaborative coaching result in an increase in replacement behaviors used by young children with or at-risk for disabilities in home settings?
(6) What are caregivers' experiences using the FBSApp Español paired with collaborative coaching to address CB at home? How do they report the usability, feasibility, effectiveness, and cultural responsiveness of the application?

Methods: Project-Wide

Research Design

To answer our research questions, we used a multi-phased mixed methods approach. We used a variation of a fully mixed, exploratory sequential equal status design (QUAL→QUAN/qual), in which the data collected in the initial qualitative phase (i.e., Phase 1) were used to develop and inform the following quantitative phase (i.e., Phase 2), with qualitative and quantitative data carrying equal weight throughout (Creswell & Plano-Clark, 2018; Leech & Onwuegbuzie, 2009). Consistent with an

exploratory sequential design, the results of the first, qualitative method helped to develop and inform the second, quantitative method (Greene et al., 1989; see Figure 1).

The mixed methods design is an appropriate design given that we sought to develop an intervention tool and accompanying coaching procedures that were both substantively relevant and culturally sensitive (Creswell & Plano-Clark, 2018). To enrich the experimental results, we also embedded secondary qualitative measures (i.e., caregiver questionnaire). In this phase (i.e., Phase 2), the primary design is the quantitative experimental intervention; the embedded qualitative methods provided a means for incorporating the participants' experiences into the intervention, and for conducting an integrated evaluation of the effectiveness of the intervention (Corr et al., 2020). Such contextual information may support the effectiveness of future interventions for tailoring coaching practices to diverse families' unique needs.

During Phase 1, we conducted an informal review of the literature around culturally responsive adaptations for parent coaching interventions for CB for Hispanic/Latino families. We then applied preliminary adaptations to the intervention (i.e., FBSApp Español and accompanying collaborative coaching procedures) in collaboration with the Opinion Leader, Ana Paula (see Research Team; Domenech Rodriguez & Wieling, 2004). We then evaluated these adaptations through two qualitative methods: (1) semi-structured interviews with early childhood professionals experienced in providing coaching services to Spanish-speaking families of young children with disabilities/delays and CB, and (2) focus groups with Spanish-speaking caregivers of young children with disabilities/delays and CB. Transcripts from these procedures were then coded and analyzed, the results of which were used to inform procedures in the subsequent quantitative phase (i.e., Phase 2).

During Phase 2, we utilized a multiple-probe across behaviors (sessions; Gast et al., 2018) single-case experimental design to evaluate the intervention with three Spanish-speaking families. The multiple-probe design is appropriate as it allows for an examination of the functional relation between intervention variables and participant outcomes, without requiring the reversal or withdrawal of the intervention (Ledford et al., 2018). Collaborative coaching was introduced for each target strategy sequentially in a time-lagged manner. We used visual analysis of graphed data within and across conditions to examine the relation between the intervention package and caregivers' use of target strategies, child use of CB, and child use of replacement behaviors (RB).

We also utilized embedded qualitative methods (i.e., caregiver questionnaire) focused on examining and optimizing families' experiences with the FBSApp Español and collaborative coaching. These data allowed for a deeper understanding of the families' experience with the intervention before, during, and after the experimental process. Because "cultural adaptation of an intervention is not static," (Domenech Rodriguez & Wieling, 2004, pp. 326) we intended for the research procedures to be an iterative and evolving process that will continually allow for further adaptation and refinement of the intervention tools and procedures for novel populations.

Collaborating Sites

Developing and vetting effective and culturally-responsive early intervention practices for diverse children and families requires collaboration with members of the target community to draw upon a comprehensive set of experiences and values (Bernal & Domenech Rodriguez, 2009; DuBay et al., 2017; Lau, 2006). To this end, we recruited participant members of the target culture (i.e., Spanish-speaking family members of young children with disabilities/delays, and early childhood professionals experienced in coaching such families) from multiple sites to capture a wider breadth of cultural perspectives within our target population. By aggregating data from individuals with a range of perspectives, in multiple locations, of varying levels of education and life experiences, all focused

toward the same end, we hope to contribute to a larger body of knowledge on what works, for whom, and under what conditions.

Throughout this manuscript, we will refer to the population of interest as "Spanish-speaking," unless individual participants explicitly identified a preference for identifying their race/ethnicity (e.g., Hispanic, Mexican, Latino). We appreciate that cultural nuances can vary widely within the Spanish-speaking population, given that the language encompasses a wide-ranging geographic, ethnographic, religious, and historical distribution (Torres & Solberg, 2021). For the purposes of this study, we focused specifically on individuals who were of Latin American descent (i.e., Spanish-speaking countries of the Western hemisphere, excluding Brazil) and currently living in North America.

Research Team

The lead researcher and CA is a White, 30-year-old female doctoral candidate in early childhood special education and board-certified behavior analyst (BCBA), a Native English-speaker with limited working Spanish. The lead researcher coordinated and oversaw all project development and research efforts, including recruiting participants; conducting semi-structured interviews; coordinating data collection, entry, and analysis; training and supervising coaches; and organizing app development and refinement activities.

The OL is Ana Paula Martínez Cueto, a Mexican, 28-year-old early interventionist, clinic owner, BCBA, and associate professor of pediatrics at Tecnológico de Monterrey. Ana Paula is a Native Spanish-speaker and bilingual in English; she provided project coordination support out of the Kommati clinic in Monterrey, including assistance with recruitment of participants; coordination of data collection and data entry; and assistance with app development and refinement activities.

The faculty advisor for the first author is Erin E. Barton, a white, 45-year-old female associate professor of early childhood special education and BCBA-D. She is a Native English-speaker with elementary Spanish; she assisted with the conception and design of the study, analysis of quantitative and qualitative data, and app development and refinement activities.

The remaining members of the research team contributed to the translation and adaptation of study materials; recruitment activities; data collection, coding, and entry; conducting and translating focus groups; and one-on-one support and coaching on intervention strategies and app use for single-case families. Amber Hauber is a White/Hispanic, 26-year-old female master's student in the Learning, Diversity, and Urban Studies department at Vanderbilt University, and a Native English-speaker and bilingual in Spanish. Cynthia Martínez-Cueto is a Mexican, 26-year-old female behavior therapist with a master's degree in psychopedagogy, and a Native Spanish-speaker bilingual in English. Caty Gonzalez is a Mexican, 25-year-old female behavior therapist at Kommati, and a Native Spanish-speaker with professional working English. Rhea Patney is a White/Indian, 19-year-old female undergraduate biology student at Vanderbilt University. She is a Native English-speaking U.S. citizen with limited working Spanish. Lauren Donahue is a White/Mexican, 23-year-old master's student in early childhood special education at Vanderbilt University. She is a Native English-speaker with full professional Spanish.

Researcher Positionality

As stated above, the two primary members of the qualitative analysis team included the lead researcher and a collaborative coder who was also the lead researcher's faculty advisor. We both specialize in early childhood special education, with experience in single-case and qualitative research. We both have experience as special education teachers, and as a coach and trainer for special education teachers, early intervention providers, and parents. We also have served in various roles while developing and testing the FBSApp since its conception in 2015, including primary investigator, project coordinator, data collector and coder, and family coach. Our focus on supporting families of young children with CB informed and guided our analysis, allowing for critical conversations around cultural

responsiveness, balancing flexibility and systematicity, and collaborative coaching processes. Finally, the lead researcher lived and worked in Monterrey, Mexico for six months during data collection and analysis; this experience of being a visible minority in a foreign country was significant in informing the interpretation, analysis, and application of the data.

Philosophical Assumptions

This project was guided by a pragmatist worldview. Pragmatism was first associated with mixed methods research by Tashakkori and Teddlie in 2003 and has since been embraced as "the optimal worldview or paradigm for mixed methods research" (Creswell & Plano-Clark, 2018, pp. 39). A pragmatist worldview acknowledges the value of both subjective and objective knowledge when engaging with the world–and with research–and recognizes the possibility of singular and multiple realities among participants and researchers alike.

Pragmatism also emphasizes the importance of practicality in addressing the research questions by using "what works" and not being afraid of utilizing diverse approaches (Tashakori & Teddlie, 2003). A pragmatic approach allows for methodological choices to be guided by a practical and applied philosophy. This worldview is evidenced in our incorporation of both single-case and qualitative methods, our consideration of context, and the emphasis on participants' lived experiences in conjunction with observational data.

Phase 1: Methods

Phase 1 of the project consisted of four distinct parts: preliminary adaptations, semi-structured interviews, focus groups, and subsequent adaptations. In the following section, we will present the methods for Phase 1, our findings, and the connection to the subsequent Phase 2.

Preliminary Adaptations

The Cultural Adaptation Process model described by Domenech Rodriguez and her colleagues (Domenech Rodriguez & Wieling, 2004; Bernal & Domenech Rodriguez, 2012) guided our process for identifying and applying preliminary adaptations to the FBSApp and accompanying collaborative coaching procedures. The CA and OL met to collaborate, discuss community need and interest, and discuss preliminary adaptations. After reviewing the existing literature, the OL and CA then worked together to apply and analyze preliminary adaptations. We leaned primarily on works by several key researchers in the area of cultural adaptations for Hispanic/Latino families and family-centered interventions on CB (e.g., Colby Chlebowski, Michaela DuBay, Sandy Magaña).

Adaptations are described in further detail below, grouped according to the five key dimensions of the Ecological Validity Model (EVM; Bernal et al., 1995; Bernal & Domenech-Rodriguez, 2012): language, persons, content, methods, and context. We will describe adaptations made to both the FBSApp and the procedures used in Phase 2 together here, given that they were applied and evaluated together in Phase 1. All initial adaptations were made prior to semi-structured interviews and focus groups (i.e., September 2021 – October 2022).

Language

All content (written and audio) was translated into Spanish. This translation involved an exact forward and backward translation by a bilingual team (i.e., Cynthia, Caty, Amber, and Lauren), with linguistic adaptations made to ensure both the conceptual integrity and readability of the content for families. For example, the exact translation of "prompt" into Spanish might be *la sugerencia* (i.e., suggestion) or *el aviso* (i.e., notice or warning). However, a more accurate and representative translation of "prompt" in the context of behavioral intervention might be *el apoyo* (i.e., support). Such linguistic adaptations were made together by the translation team. The team also made recommendations related to improving the readability of the content by providing alternative descriptions of technical terms or additional visual cues to emphasize key concepts.

Persons

We included individuals of matched language and culture in the adaptation and validation process from start to finish, including both qualitative and quantitative data collection and analysis procedures. For collaborative coaching, we employed a Spanish-speaking coach familiar with Hispanic/Latino culture and customs, who had experience working with diverse families (i.e., families with similar and dissimilar cultures to their own). The exact degree to which the coach needed to match the family's culture was not defined or agreed upon; strategies for assessing biculturality and "goodness of cultural fit" should be investigated in future works.

Content

We designed adaptations to content to make the instructional materials and coaching procedures more relevant to the families' cultural values by aligning with and referencing cultural concepts and themes. For example, we emphasized the role of *familismo* (Falicov, 1998) by including representations and descriptions of extended family members in instructional materials. We also encouraged caregivers to include relevant extended family members in the coaching process.

Research suggests Hispanic parents are more likely to value obedience and *respeto* over autonomy and independence (Calzada et al., 2010); we emphasized the importance of *respeto* by including a BSP strategy focused on systematic methods for teaching young children to follow directions when presented with a demand. We also included questions in the intake procedures for the coaching study to better identify the importance of obedience for each participating family (e.g., "How important is it for you that your child follows your directions the first time they're asked?"). We modified the prevention strategy of "Follow your child's lead in play" to "Play with your child." This placed greater emphasis on commenting and engaging with the child in the context of caregiver-chosen activities rather than giving more choice and autonomy in play interactions, behaviors that are generally viewed as culturally atypical for Hispanic caregivers (Peredo et al., 2018).

Finally, we expanded the instructional materials used in intervention to more clearly describe the purpose and goals as they related to the family's values (Buzhardt et al., 2016). We included questions during intake to identify the family's goals for the target routine, and training on each target strategy included specific examples relevant to the family. Any English technical terms (e.g., escape-maintained behavior) that did not have a Spanish equivalent were noted and thoroughly explained during coaching.

Methods

We adapted the coaching methods used later during Phase 2 of the project to include a greater sense of collaboration and flexibility for families' preferences, schedules, and values (Chlebowski et al., 2018; DuBay et al., 2022). The method and frequency of parent-coach communication was individualized to caregivers' preference, including weekly coaching meetings (e.g., conducted via Zoom or phone, or pre-recorded for caregivers to watch at their convenience) and communication between meetings (e.g., text, email, phone). We included questions in the intake and coaching procedures to better understand families' preferences and comfortability with the intervention (e.g., "Is there anything you would change about the coaching you've received thus far?") and incorporated their feedback regarding target strategies and condition change decisions (e.g., "Would you like to schedule the next strategy training for next week, or would you like more time to practice this strategy?").

We also incorporated an emphasis on fostering warm and trusting relationships between the coach and caregiver (i.e., *personalismo*, Magaña et al., 2019; Martinez-Torres et al., 2021). These adaptations including incorporating time to check in with the caregiver on the child's process, their own well-being, and the well-being of others in the family during Zoom sessions. We intentionally elicited feedback from caregivers both during sessions and in the on-going questionnaire to allow for multiple

modalities of communication and to strengthen the likelihood of genuine, honest feedback on the intervention procedures.

Context

We individualized the routines targeted for intervention in Phase 2 to each caregiver's preference and encouraged additional family members or caregivers within the home (e.g., grandparents, siblings, babysitters) to participate in intervention, including BST meetings, coaching meetings, and downloading and using the FBSApp and prescribed strategies.

Semi-Structured Interviews

The lead researcher conducted semi-structured interviews after initial adaptations were made (i.e., October-November 2022). The purpose of semi-structured interviews was to collaborate and incorporate the feedback of professionals within the target community with relevant experience, with the goal of strengthening the ecological validity of the intervention.

Participants

After obtaining approval from the institutional review board, we recruited professionals to participate in interviews from two primary sites: Nashville, TN and Monterrey, MX. We posted recruitment materials (i.e., flyers; see Appendix B) to social media and emailed to relevant service providers (e.g., ABA clinics, early interventionists) in and around the primary sites. We intentionally recruited professionals reflective of the target population for whom our intervention was intended to maximize the relevance and ecological validity of our data (i.e., purposive sampling; Patton, 2015).

Participants expressed interest in participation by completing an online form via REDCap (Harris et al., 2009; see Appendix D) or by contacting the lead researcher directly. They were screened for inclusion according to the following criteria: (a) currently practicing as an early interventionist, behavior analyst, developmental specialist, or in a similar early childhood-centered role providing services to families, according to self-report; (b) at least two years of experience working with Spanish-speaking families of young children, according to self-report; (c) familiarity with function-based supports and positive behavior interventions and supports (PBIS), according to self-report. After confirming professionals met inclusion criteria, they were consented for participation and an interview was scheduled. Twenty-three individuals expressed interest in participating, of which 18 met inclusion criteria. Six professionals scheduled and completed an interview. Descriptive information about the participants is available in Table 1. Participants were located across the United States and Mexico, employed in a variety of roles with varying years of experience working with Spanish-speaking families.

Procedures

Interviews. The lead researcher conducted semi-structured interviews in English via Zoom, using the interview protocol included in Appendix C. Interviews lasted 20-40 minutes and questions were semi-structured, in that we had a set of guiding questions, but the style was open-ended and responsive to the lead of the interviewee (Spradley, 1979). The central questions, common to all interviews, prompted participants to describe their experiences adapting coaching materials and procedures for Spanish-speaking families. We also elicited feedback on the usability, feasibility, effectiveness, and cultural responsiveness of the FBSApp and the coaching procedures. Interviews were recorded, transcribed using Otter.ai, and checked for accuracy by the first author.

Data analysis. We will describe qualitative analyses for both semi-structured interviews and focus groups in the paragraph titled "Data analysis" on the following page.

Focus Groups

We conducted focus groups after semi-structured interviews (i.e., January 2023). The purpose of focus groups was to collaborate and incorporate the feedback of families within the target community, with the goal of strengthening the ecological validity of the intervention. Further, we included both

focus groups and interviews in Phase 1 to build a more comprehensive understanding of our intervention as a whole, and particularly the cultural responsiveness as perceived by relevant stakeholders (Adami, 2005; Creswell & Plano-Clark, 2018).

Participants

We recruited caregivers to participate in focus groups out of the two primary sites. Recruitment materials were posted to social media and emailed to relevant service providers (e.g., ABA clinics, early interventionists) in and around the primary sites. We intentionally recruited family members reflective of the target population for whom our intervention was intended to maximize the relevance and ecological validity of our data (i.e., purposive sampling; Patton, 2015). We also sought to gather perspectives from another stakeholder group, given the potential points of divergence and convergence in the perspectives of families compared to professionals (Cheblowski et al., 2018).

Participants expressed interest in participation by completing an online form via REDCap (Harris et al., 2009; see Appendix E) or by contacting the lead researcher directly. They were screened for inclusion according to the following criteria: (a) self-identify as Hispanic and/or Latino ethnicity, (b) Spanish-speaking in the home at least 50% of the time, according to self-report, (c) primary or co-caregiver of a child younger than 8 years of age who has or is at-risk for a diagnosed disability or delay, according to self-report. After confirming participants met inclusion criteria, they were consented for participation and the focus groups were scheduled. Forty-four caregivers expressed interest in participating, and 39 met inclusion criteria. Seventeen caregivers confirmed their intent to attend the scheduled focus group, of which 12 attended and participated. Descriptive information about the participants is available in Table 2. Participants were located in the United States, Mexico, and Canada.

Procedures

Focus groups. We (i.e., Claire, Caty, and Amber) conducted focus groups in Spanish via Zoom, using the focus group protocol included in Appendix F. Focus groups lasted between 45 and 85 minutes, with 2 to 5 participants in each group. Focus groups were semi-structured to allow for an open conversation between group members about their experiences and perceptions, focused around the central guiding topics of the FBSApp and proposed coaching procedures (Patton, 2015). The central questions, common to all focus groups, centered around the usability, feasibility, effectiveness, and cultural responsiveness of the FBSApp and the coaching procedures. Focus groups were recorded and transcribed by Otter.ai. The translation team (i.e., Caty, Cynthia, and Amber) checked the transcripts for accuracy and translated them into English for analysis.

Data analysis. We used a 6-phase process of thematic analysis (Braun & Clarke, 2006) to understand participants' perspectives on the FBSApp and the proposed coaching procedures, as well as professionals' experiences and recommendations for making adaptations for coaching Spanish-speaking families. Qualitative analysis centered around research questions #1 (i.e., necessary adaptations to the intervention package) and #2 (i.e., stakeholders' perception of the intervention package), which we used as guidance when developing and refining codes. See Figure 2 for the steps in the qualitative analysis and the codes associated with each step of the thematic analysis.

Phase 1 of the thematic analysis began with listening to recordings of and reading transcripts of interviews and focus groups for understanding and familiarization with the data. Then, in Phase 2 of the thematic analysis, the lead researcher and collaborative coder utilized an open coding process (Corbin & Straus, 2008) to allow themes and patterns to surface that repeated within and across each transcript. Phrases, word groups, or sentences that described a cohesive concept or experience were identified as the unit of analysis. A secondary coder (i.e., Rhea) independently identified units of analysis for 33% of sources (i.e., two of six interview transcripts, one of three focus group transcripts); the lead researcher and secondary coder then met to discuss discrepancies and come to a consensus before moving to the

next phase of analysis. The units of analysis were grouped according to similar themes, leading to initial categories for further analysis (i.e., descriptive codes such as "participant's experiences coaching Spanish-speaking families"; Saldaña, 2015). This led into the creation of the initial codebook in Phase 3 of the thematic analysis. In subsequent thematic analysis phases, these initial categories were reviewed, combined, or refined as needed, and patterns within and across categories were identified (i.e., pattern codes such as "considering role of deference to authority in Hispanic/Latino culture"; Saldaña, 2015) as each data source was coded.

Throughout the coding process, we actively looked for disconfirming evidence to protect against our own biases and enhance the validity of the findings (Corbin & Strauss, 2008). As new information or themes emerged, they were compared with existing themes and sorted appropriately, or were used to build a new theme (i.e., constant comparative method; Corbin & Strauss, 2008).

In the next phases of thematic analysis (i.e., phases 4 and 5), we coded all data sources to further define and refine the themes, and to identify the total number of units associated with each theme and sub-theme. A secondary coder (i.e., Rhea) independently coded 33% of the units of analysis from interviews, and 33% of the units of analysis from focus groups. The lead researcher and secondary coder then met to discuss discrepancies and come to a consensus before moving to the next phase of analysis. As transcripts were analyzed and the codebook refined, we first compared them to other immediately relevant data sources (i.e., a codebook was created for semi-structured interviews and another codebook was created for focus groups). This process allowed for identification of patterns within data sources, which could then be compared across data sources to identify themes that cut across data sources and pointed in the direction of overarching concepts.

The final phase consisted of selecting data extracts, writing a report of our findings, and conducting member checks with participants. We utilized the Synthesized Member Checking (SMC) protocol as outlined by Birt and colleagues (2016). After completing qualitative data analysis, the lead researcher prepared preliminary claims and emergent themes into synthesized summaries. These summaries were shared with participants via an emailed REDcap survey, with accompanying prompts such as, "Does this match your experience? Would you like to change, delete, or add anything?" Four of six professionals and three of twelve caregivers responded to the survey. Responses were gathered and cross-referenced with existing codes and themes, and subsequently integrated into the qualitative findings. All participants' responses were in alignment with our findings, and often provided additional, elaborative detail; for example, regarding the feedback on coaching procedures, Annabel said, "I agree with the positive and suggestive feedback. I think possibly acknowledging that some Latino families may possibly using spanking as punishment." See Appendix G for SMC surveys.

Trustworthiness. Throughout qualitative data analysis, we took steps to strengthen the credibility, transferability, and dependability of the data and the conclusions drawn from these data (Lincoln & Guba, 1985). Transcripts were triangulated to compare and cross-check emergent themes both across and within participant (Fetters, 2020). Coding and analysis was conducted collaboratively throughout, with the lead researcher and collaborative coder engaging in ongoing "shop-talking" of data (Patton, 2015). During this process, coders engaged in an ongoing, iterative cycle of discussing and analyzing the data and the codebook itself during regular (i.e., bi-weekly) meetings. These meetings allowed for regular discussion of the data, our interpretations of the data, and the implications for subsequent phases of the study.

A tertiary coder independently coded 33% of data sources, including the initial grouping of transcripts into units of analysis and the application of the final draft of the codebook. Intercoder agreement was calculated only for the application of the final draft of the codebook. We double coded more than the typical recommendations for qualitative reliability (e.g., O'Connor & Joffe, 2020) to

provoke critical conversations around the data and to encourage thoroughness in our interpretations (Barbour, 2001). Agreement was 89% for interviews, with a kappa value of 0.90; percent agreement was 86% for focus groups, with a kappa value of 0.85. Finally, we conducted member checks with participants involved in both phases of data collection to confirm or disconfirm interpretations and to strengthen the validity of our findings (Merriam & Tidsell, 2015).

Results: Phase 1

Data from the interviews and focus groups are reported either in isolation, mixed, or both, as appropriate. Qualitative findings are presented to provide stakeholders' perspective on the intervention and to "explain" the procedures used in the following quantitative phase (i.e., research questions #1-2). We will first present findings from semi-structured interviews, followed by focus groups, closing with changes made to the intervention package before quantitative testing. See Tables 3 and 4 for a detailed breakdown of units of analysis and themes and sub-themes for semi-structured interviews and focus groups, respectively.

Semi-structured Interviews

Professionals' Experience Adapting Interventions for Spanish-Speaking Families

Several themes emerged regarding the interviewees' experiences adapting interventions, content, and procedures for Spanish-speaking families. Adaptations fell into two exhaustive categories: 1) adaptations that were specific to Latino/Hispanic culture (n = 7), and 2) adaptations that were family-centered practices, but not necessarily culturally specific (n = 5).

The act of translating and adapting the language to be linguistically, culturally, and personally relevant for families was a key adaptation discussed by every interviewee. Andrea said, "I've never used a curriculum that is specifically made for Spanish-speaking Hispanic or Latino families. So it's always kind of been on the fly translation and interpreting." Addison described her experiences with "translating and interpreting the things that my BCBA wanted to come across…and really trying to make it where I know that its common language for what the culture uses." Rachel talked about the need for simplifying content, both to expedite translation through an interpreter and to support the parents' understanding. These experiences point toward a continued need for resources and service providers that are of matched language for families, and familiar with cultural norms associated with Hispanic/Latino families. Other culturally specific adaptations included an attitude of cultural humility (n = 3), considering the role of deference to authority (n = 2), education on U.S. customs (n = 9), replacements for physical punishment (n = 4), consideration of the entire family unit (n = 6), and addressing stigma around disability (n = 9), including autism (n = 6).

Another common theme across all interviewees was the need to be flexible and individualize their coaching for each family they worked with, including the involvement of other family members (n = 6), targeting routines or behaviors of priority to the family (n = 8), and providing additional resources relevant to the family (n = 8). Antonia said, in reference to our collaborative coaching procedures, "I really appreciate the emphasis on meeting families where they're at, because when we talk about culture, it doesn't mean that it's going to play out in every single family in the exact same way." Professionals also expressed explicit methods of individualizing content to each family, including using pictures and videos of their children, examples of scenarios that related to their child, and the involvement of specific family members that lived in the house. Individualization to the family unit's distinct culture was a key component for professionals coaching families of young children. Other family-centered adaptations that were not necessarily specific to Latino/Hispanic culture including simplification of content and procedures (n = 6), and language adaptations (n = 12).

Professionals' Perception of the Intervention

FBSApp: positive feedback. Interviewees were overwhelmingly positive in their feedback regarding the FBSApp, with 71 statements classified as positive feedback (i.e., 65% of total statements on the app). Positive feedback statements most often centered around the strategies used in the BSP (n = 12), and the accompanying videos (n = 8) and infographics (n = 6). For example, one research assistant and behavior technician said, "It's really cool that they have different strategies, but also that it is linked to a video too, explaining a bit more about the strategy." Several statements highlighted the usefulness of the app when paired with support from a professional (n = 7), while others pointed toward the importance of a resource that families could access independently (n = 8). Taken together, these statements support the flexibility of the FBSApp as a meaningful tool for a variety of situations. Cristina said, "For families to use it, with the support of a person who can teach them how to navigate through challenging behavior with the help of technology…that's honestly revolutionary, almost unheard of here." Rachel spoke of the challenges families face when transitioning out of early intervention services, and the appeal of a support tool that could "go with them," since "they don't have me forever." Alma highlighted the convenience of a mobile resource, especially for families attempting to collect data. The availability of an effective and usable tool, with the flexibility to be accessed independently or with the help of a professional, was highlighted by many as a strength of the FBSApp.

FBSApp: concerns and recommendations. Overall, there were 20 statements classified as recommended changes to the app, and 18 statements classified as recommended additions. Most of the changes (n = 12) centered around the wording or phrasing of the material, with idiosyncratic feedback on the verb tense (present vs future) and the use of the formal *usted*. Cristina gave suggestive feedback on the readability of the infographics, saying "they are a little bit saturated. It does seem like a lot of information that also takes you out of the app, and it doesn't quite feel as inviting to learn." Alma recommended using more "wording that is familiar for them…that is not clinical terminology or anything like that." The recommendations for additions included resources around developmentally appropriate behaviors (n = 8), meeting children's basic needs (n = 2), and resources on autism (n = 5), including connections with autism-specific support groups (n = 2).

FBSApp: cultural responsiveness. None of the interviewed professionals recommended any changes to the app to improve the cultural fit for Spanish-speaking families. Alma, a developmental specialist in Florida who was also a native Mexican and mother said, "I honestly cannot think of anything I will change from what I read and what you explained. I don't think anything is inappropriate or out of context for [Spanish-speaking families]." Antonia said that, if she were using the FBSApp with families, "I'm not sure I would take any of [the strategies] away. If anything, I would just add to it." She went on to describe ways she would individualize to families, including "giving them a lot of options" for how and how often they wanted to communicate, and taking the time to "gauge how much they know and then go from there."

Collaborative coaching. Most of the feedback from interviewees regarding the collaborative coaching procedures was positive (n = 28, 80%). Andrea expressed appreciation for "taking the family's goals and values into consideration," and Antonia for "meeting the family where they're at" regarding scheduling, communication preferences, and target strategies. Four interviewees spoke specifically of the procedures' flexibility to meet individual families' needs. None of the interviewees recommended making any changes or removals to the planned coaching procedures. Addison encouraged us to take steps to create an "environment where [caregivers] are open to share…any concerns on the quality of services that they're receiving, or just general feedback." A strong emphasis on a collaborative relationship, with bidirectional communication and intentional involvement of family members, was a key theme throughout the project, especially in semi-structured interviews.

Focus Groups

Families' Perceptions of the Intervention

Families' feedback on the intervention (both FBSApp and collaborative coaching) were largely positive (n = 28, 74%), with a high proportion of clarifying questions (n = 38). Caregivers voiced positive feedback about the strategies included in the BSP (n = 4), with one saying, "I like the fact that I can use it like a database, where I can see all the strategies in one single page." Five caregivers expressed their difficulty accessing resources, giving voice to both their own struggles and the struggles of other caregivers, and highlighted the benefits of the FBSApp for bridging the gap for families with less access to services (e.g., diagnosis, early intervention, related therapies). Three caregivers stressed the importance of receiving support in naturally-occurring contexts (i.e., at home or in the community). One mother expressed frustration with trying to find a therapist that would come to their home to observe her child's behavior. None of the caregivers felt the intervention package was culturally inappropriate or in need of further adaptation to be a fit for Spanish-speaking families. One caregiver said, "I think it is appropriate for Spanish-speaking families, but yes, it takes a lot of commitment…and that depends on the family."

Suggestive feedback was often idiosyncratic according to individuals' preferences, such as embedding the results of previous studies into the app (n = 1), improving navigability (n = 2), and modifying the language (n = 1). There was no suggestive feedback specific to the coaching procedures. Two common themes emerged from families' feedback on the intervention, including requests for a version compatible with Android devices (n = 6), and the ability for greater individualization within the app itself (n = 7). For example, one mother suggested being able to collect data on the perceived effectiveness of specific strategies on the BSP, and another suggested adding an open response text box to the progress monitoring page so that families could input anecdotal information about specific things that happened that day.

Data Integration and Interpretation

In accordance with exploratory mixed methods design, the results from the initial qualitative phase were used to inform the intervention tested in the following quantitative phase. We used qualitative results (e.g., themes and significant statements) identified in the interviews and focus groups to refine the FBSApp and the collaborative coaching procedures before testing the intervention package with families. For example, the recurring theme of "importance of individualization to individual family units" was applied to the coaching procedures by identifying key points throughout intervention at which families could be involved in the decision-making process (e.g., condition change decisions). We then used the embedded qualitative measures to explain and expand upon the quantitative data collected in the single-case study. Finally, during and after single-case data collection, we continually revisited the qualitative data from Phases 1 and 2 to draw connections between both phases of the study and to better understand families' experiences with the intervention (Creswell & Plano-Clark, 2018).

Subsequent Adjustments to the Intervention

Based on the significant themes identified in Phase 1, we made several key adjustments to the FBSApp and the coaching procedures. First, we shared all feedback relating to language and translations with the translation team and discussed appropriate edits that were both feasible and felt necessary given our time and resource constraints. This included making the verb tenses consistent across strategies, and consistently using the formal *usted*. Based on the feedback from caregivers about the required effort of the intervention, and the emphasis across interviews and focus groups on the importance of individualization, we made two key changes. For collaborative coaching, we added opportunities for families to voice their preferences for target strategies to allow for further individualization and collaboration with caregivers. We also elaborated on our informed consent procedures to more clearly

communicate the proposed data collection and coaching procedures, and to support families in making an informed decision about their participation in the intervention.

Methods: Phase 2

The single-case coaching study was conducted after Phase 1 was complete and additional adaptations were made to the FBSApp materials and coaching procedures based upon the qualitative findings. Recruitment began in February 2023 and data collection was completed in July 2023.

Design

We utilized a concurrent multiple probe across behaviors (sessions; Gast et al., 2018) single-case research design to experimentally analyze the effects of the FBSApp paired with collaborative coaching on caregiver and child behaviors. We embedded qualitative methods focused on examining, improving, and expanding upon families' experiences with the FBSApp Español and collaborative coaching.

We introduced coaching for each target strategy sequentially in a time-lagged manner, after an initial baseline phase. We used visual analysis of graphed data within and across conditions to examine the relation between the intervention package and caregivers' use of strategies, child use of CB, and child use of RB. Specifically, we analyzed the level, trend, and variability of data within conditions, and the overlap, immediacy of change, and consistency of data across conditions (Barton et al., 2018). Qualitative data were collected via caregiver questionnaire at pre-study, throughout intervention, and at two weeks post-study.

Participants

We recruited caregivers to participate in the single-case study out of the two primary sites. Recruitment materials were posted to social media and emailed to relevant service providers (e.g., ABA clinics, early interventionists) in and around the primary sites. We also contacted individuals who participated in previous phases and indicated interest in participating in the single-case study. Participants expressed interest in participation by completing an online form via REDCap (Harris et al., 2009; see Appendix H) or by contacting the lead researcher directly.

We screened interested caregivers according to the following criteria: (a) child is between 24 and 72 months of age; (b) child is diagnosed with a disability or delay, or is considered at-risk according to the Ages and Stages Questionnaire: Social-Emotional, 2nd edition (ASQ-SE-2; Squires et al., 2015); (c) child demonstrates a consistent pattern (i.e., three or more times per week) of CB in the home setting, according to caregiver report; (d) family speaks Spanish in the home at least 50% of the time, according to caregiver report; and (e) caregiver identifies self and child as Hispanic and/or Latino ethnicity.

If families met inclusion criteria, an informed consent meeting was scheduled, during which the lead researcher and a member of the coaching team met with the family to ensure the caregiver understood the study procedures and timeline, answer any questions the caregiver had, and obtain consent for participation. Eleven families expressed interest and were screened for inclusion; four families met criteria and were interested in participating. Due to resource constraints, only three families were consented for participation in the single-case study. Decisions about included families were made primarily based on the timing of their interest survey, but also included considerations around the family's current access to services (see Appendix I for the intake protocol). Detailed demographic information about each family is included in Table 5.

Family 1

Family 1 consisted of a mother and daughter dyad living in Honolulu, Hawaii. Delia was a 41-year-old female of Bolivian descent, identifying as Hispanic, with a bachelor's degree. She was a full-time homemaker and caretaker to her two daughters, Mireya (15) and Sofia (26 months at intake). A Native Spanish speaker and bilingual in English, she spoke both Spanish and English at home with her daughters. The father was a member of the U.S. Air Force and was deployed overseas for the entirety of

the study. Just before Delia participated in the focus group, Sofia was diagnosed with ASD, speech-language delay, and developmental delay. Sofia was enrolled in partial-day preschool and received speech-language therapy, behavior therapy, physical therapy, and feeding therapy. Their target routine was bath time; the target CB during bath time was verbal aggression (i.e., whining, screaming) that sometimes escalated to physical aggression (see Table 6 for operational definitions of CB for each family).

Family 2

Family 2 consisted of a mother and son dyad living in Seattle, Washington. Valeria was a 29-year-old female of Mexican descent, identifying as Hispanic, with less than a high school diploma. She was a full-time homemaker and caretaker to her two children, David (40 months at intake) and Daria (10 months). A Native Spanish speaker and bilingual in English, she spoke Spanish at home with her children. The father was also present in the home and worked full-time. David had a diagnosis of speech-language delay and did not receive any services or schooling outside the home. Their target routine was transitioning from TV to a less-preferred activity (e.g., brushing teeth, nap). The target CB was elopement and noncompliance that occasionally escalated to self-injury.

Family 3

Family 3 consisted of a mother and son dyad living in Monterrey, Mexico. Mariela was a 32-year-old White/Mexican female with a master's degree. She worked full-time as a lawyer and as a caretaker to her two children, Ronaldo (37 months) and Liliana (12 months). Mariela was a Native Spanish and English speaker; she spoke Spanish at home with her children. The father was also present in the home, along with the grandmother and a maid. Ronaldo had diagnoses of ASD and ADHD and was enrolled part-time in preschool. He also received speech-language therapy and behavior therapy. Their target routine was meal time; the target CB was elopement, noncompliance, and verbal aggression (i.e., excessive crying, whining).

Setting and Materials

All study procedures were conducted via Zoom. The coach and primary caregiver collaborated to identify the target routine for each family, and the caregiver recorded all routine observations on their personal phone or tablet and uploaded them to a secure online hard drive (i.e., Box). Data were collected, graphed, and analyzed via Microsoft Excel. The primary research team and each participating family used their personal phone and/or tablet to access the FBSApp. All coaching materials (e.g., target strategy training slides, infographics, videos) were created using PowerPoint templates and/or pre-existing resources embedded within the app (see Appendix J). All text communication between caregivers and research personnel took place via email or WhatsApp.

Dependent Variables and Coding Procedures

Caregiver Use of Target Strategies

The primary caregiver's use of the target intervention strategy was the primary dependent variable (i.e., used to make condition change decisions). Based upon the hypothesized function of the child's CB, a list of recommended strategies was generated by the FBSApp; the caregiver and coach collaborated to identify strategies to target from that list, based upon the context of the routine and the caregiver's preferences. For example, since Valeria's target routine was transitions from a preferred activity to a non-preferred activity, one of the target strategies selected was transition warnings. Similarly, Delia requested to focus on prevention strategies, so the caregiver-coach team targeted two prevention strategies and one teach strategy that Delia was already inconsistently utilizing. See Table 7 for operational definitions, examples, and non-examples of target strategies for each family.

Broadly, universal strategies were vocal or physical behaviors that contributed to (1) nurturing positive relationships between the caregiver and child, or (2) establishing a consistent, engaging, and

developmentally-appropriate environment (Dunlap et al., 2013). Categories of universal strategies included: Self-Love, Setting Up the Day, Keeping it Positive, Clear Rules, and Feelings. Specifically, an example universal strategy within the category of Keeping It Positive is positive descriptive feedback, defined as: vocal statements containing both (1) positive language, and (2) a descriptive of a specific behavior that the child demonstrated (e.g., "Great job putting on your shoes!")

Prevention strategies were vocal or physical behavior which involved changing the antecedents that typically occur before CB to make CB less likely to occur and desirable replacements more likely to occur (Dunlap et al., 2013). An example prevention strategy is the use of transition warnings, defined as: a vocal description of (1) the duration or frequency/amount remaining, or (2) a signaling event to prepare the child for an upcoming change (e.g., "One more turn, and then time to get ready for bed.")

Teach strategies were opportunities presented by the caregiver for the child to use an appropriate replacement skill, including an establishing statement that increased the value of a reinforcer and/or indicated that the reinforcer was available. An example of a teach strategy is a vocal statement that motivates the child to request for a demand to be withdrawn through the suggestion of a functional request the child could use (e.g., "All done with bath, or more?").

Response strategies were caregiver behaviors in response to CB that were functionally incompatible, such that it reduced the likelihood of future CB. An example of a response strategy is delaying access, defined as: caregiver denying child access to the functional reinforcer by removing the item/activity until the child is no longer engaging in CB, and engages in the appropriate RB. For example, the caregiver removes the iPad once the child begins to cry, and reinstates access to the iPad once the child is no longer crying and has appropriately requested, "iPad please?"

We used timed-event recording to mark the onset of each instance of caregiver use of a target strategy. A minimum of 3s was required between the offset of a preceding behavior and the onset of the following behavior to be considered two separate instances. Because the length of the routine observations varied, data on the use of target strategies are reported as a rate per minute.

Child use of CB

The child's use of CB was a secondary dependent variable. We used momentary time sampling with a 5s interval to collect data on the presence or absence of CB. We selected this interval size to be consistent across all three families and shorter than the mean duration per occurrence as calculated in the first pre-baseline observation for each family (i.e., 6.6s for family 1, 17.8s for family 2, 12.5s for family 3). CB was broadly defined as behavior that interferes with the child's meaningful engagement in their environment or social interactions (Smith & Fox, 2003). See Table 6 for operational definitions of CB for each family.

Child use of RB

The child's use of RB was a secondary dependent variable. RB were broadly defined as behaviors that would serve as a functional replacement for CB according to the hypothesized function identified by the FBSApp. This included appropriate requests for a functionally equivalent reinforcer (e.g., asking for help) or engagement in a behavior identified by the caregiver as a targeted behavior to increase (e.g., compliance with caregiver requests). We used timed-event recording to mark the onset of each instance of RB and reported the data as a rate per minute.

Interobserver agreement (IOA)

The primary research team served as data collectors and were trained prior to the start of data collection. The lead researcher trained the two additional coders by first providing each with a copy of the coding manual with coding procedures, operational definitions, rules, examples, and non-examples of the dependent variables (see Appendix K). Next, coders met to review the manual, discuss the coding procedures, and practice using the coding system. All three coders then practiced coding the same 5min

practice video together and compared their data. Coders then coded non-study practice videos independently until 80% agreement or above was reached on each dependent variable across two videos. To estimate IOA, two coders independently coded 40-50% of sessions for all participants on all dependent variables. For variables captured with timed-event recording, IOA was estimated using a point-by-point agreement method (Ledford et al., 2018) with a 3s agreement time-window. For CB, IOA was estimated using an interval-by-interval agreement method (Ledford et al., 2018).

Given that the coding manual and definitions were initially developed with English-speaking families and coding training was conducted in English, an ongoing conversation was initiated during this first coding meeting, with the goal of protecting the accuracy of the definitions and procedures for each family. The coding team met regularly throughout data collection to discuss discrepancies between coders and/or changes in child or caregiver behavior over time, to make clarifying adjustments to operational definitions as needed, and to prevent observer drift or instrumentation threats.

Both observers' data were plotted on the same graph and visually analyzed throughout data collection to protect against instrumentation threats, including systematic observer bias (Ledford et al., 2018). If agreement between coders fell below 80% for any individual video, the coders met to come to a consensus before coding additional videos. If agreement was below 80% for two consecutive videos, the two coders met to come to a consensus and to code an additional video together to recalibrate.

Coaching Procedures

Collaborative coaching procedures were designed as a companion to FBSApp to be used by professionals supporting families. All materials developed and used by coaches were closely aligned with existing features and resources within the app (e.g., infographics, how-to videos, PowerPoint templates). Coaching included the following components: (a) regular coaching sessions, (b) behavior skills training (BST; Miltenberger, 2012) on target intervention strategies, (c) focused observations, and (d) regular communication between sessions. Coaches were trained on the coaching procedures prior to recruitment by the lead researcher. Both coaches were familiar with the FBSApp and had been working on translation and adaptation of materials for 6-8 months prior to coaching training. All coaching sessions, strategy trainings, and communication between sessions were conducted in Spanish.

Pre-baseline

After screening for inclusion and obtaining consent to participate, the coaching team met to assign coaching and coding responsibilities according to scheduling needs and cultural alignment. Specifically, Caty coached Families 2 and 3, and Amber coached Family 1. The lead researcher and coach then scheduled an introductory meeting with each family to introduce the FBSApp, establish the family's communication and coaching preferences, and outline the role of the coach and the lead researcher (see Appendix L for introductory meeting slides). The coach also reviewed the procedures for recording and submitting routine observations and creating an account in the FBSApp.

For pre-baseline and baseline routine observations, the caregiver was instructed to begin recording just before the routine began, conduct the routine as they typically would, and continue recording until the routine ended or 10min elapsed. Pre-baseline routine observations were used to finalize operational definitions, problem-solve logistical issues with the caregiver, and develop a stronger understanding of the family dynamic, routine structure, potential functions of CB, and relevant target strategies.

Baseline

Approximately 7-10 days after the introductory meeting and after at least two pre-baseline videos had been submitted, we conducted the ABC meeting (see Appendix M for ABC meeting slides). In this meeting, the coach provided direct instruction related to antecedent-behavior-consequence data and its role in informing the hypothesized function of the child's CB. The coach and caregiver logged an

instance of ABC data into the app using a clip from a pre-baseline video. The coach reviewed procedures for the caregiver to log data independently over the following 7-10 days, during which time the caregiver also recorded and submitted 2-3 baseline videos.

After the caregiver input at least three more instances of ABC data and received a hypothesized function statement, the coach and caregiver met for the BSP overview meeting (see Appendix N for BSP overview slides). The coach reviewed the app-generated hypothesized function statement and allowed the caregiver to agree or disagree with the statement within the app. The coach then reviewed the BSP, including a brief overview of the prescribed strategies and their function and the associated instructional materials (e.g., infographics, videos).

The coach and caregiver selected the first target strategy and made a plan for continuing to record and submit observations. Intervention began as soon as possible after the BSP overview was held and at least three baseline observations had been recorded to minimize time in baseline and maximize support for the family.

Intervention

Intervention began in each tier with a BST session on the target strategy. The BST session included (a) a brief review of the target strategy using the how-to videos and infographics embedded in the app, (b) modeling examples of how to use the strategy in home routine contexts, (c) role play and discussion around the use of the strategy in the family's target routine, and (d) plan for next steps (see Appendix O for BST slides). Throughout intervention, the caregiver continued to record and upload 2-3 routine observation videos per week. Depending on the family's preferences, feedback on the caregiver's use of the target strategy after the initial BST was done primarily via WhatsApp or Zoom.

Family 1 and 2 requested to receive coaching via text in WhatsApp; Family 3 elected to receive coaching via weekly Zoom sessions. Coaching consisted of (1) checking in with the caregiver by asking how they're feeling about the strategy and the routine that week (e.g., "How are you feeling about your use of transition warnings this week?"), (2) reviewing data on the caregiver's use of the target strategy (e.g., "You used the First-Then strategy five times in yesterday's video!"), and (3) supportive feedback (e.g., "You did such a nice job of giving David choices when the timer went off to go to bed!"). Coaching centered around the target strategy assigned to the current tier of intervention; intervention began in subsequent tiers when the caregiver was consistently (i.e., over at least three consecutive sessions) using the target strategy at a level higher than baseline, expressed comfortability using the strategy, and agreed to scheduling the next BST session.

Coaching was designed to be a collaborative process between the caregiver and the coach to promote caregiver engagement and autonomy, and to cultivate a warm, supportive relationship between the caregiver and coach (*personalismo* and *simpatia;* Buzhardt et al., 2016; Magaña et al., 2014; Magaña et al., 2020). To this end, we incorporated family preferences, goals, and values into the coaching process in several key ways: (1) following a coaching and communication schedule that aligned with the family's schedule and preferences, (2) targeting strategies that the caregiver expressed interest in or preference for, (3) making condition change decisions together with the caregiver, and (4) providing additional support around routines or concerns unrelated to the study procedures. For example, Family 2 requested support around potty training in the middle of tier 2, so potty training tips were including in the subsequent coaching session.

We also set aside time in Zoom sessions and coaching communication to check in on both the child's progress and other family members' well-being (Borrego et al., 2006). Finally, reflective questions were incorporated into BST, coaching sessions, and embedded qualitative measures in which the caregiver was encouraged to think critically about the use of the strategy in their home with their child, and to give feedback on proposed adjustments to the strategies and coaching procedures.

Maintenance

Once intervention began in a subsequent tier, maintenance began for the previous tier. During maintenance, we continued to collect data on the caregiver's use of the strategy, but feedback on the caregiver's use of the strategy was no longer provided. The coach checked in with the caregiver occasionally (approximately every other week) to ensure the caregiver did not need additional support with the strategy.

Fading

After data stabilized and the caregiver expressed confidence in using the final target strategy, the coach began fading support. Coaching during this phase included an informal coaching session (without feedback) via Zoom 10-14 days after the previous coaching session and continued communication via WhatsApp. Caregivers continued to record and submit routine observations 1-2 times per week.

Procedural Fidelity (PF)

PF data were collected for 100% sessions held via Zoom (i.e., pre-baseline sessions, target strategy BST, and coaching for Family 3), and for coaching communication throughout the study. Data were collected by the lead researcher via checklist and frequency count, dependent upon the component. Zoom session PF was consistent across all three families; coaching PF components were individualized to the family based upon their preferences for coaching and communication. See Appendix P for examples of completed PF checklists.

Social Validity

Social validity of procedures and outcomes was assessed via embedded qualitative measures throughout the single-case study. A caregiver questionnaire was completed at pre-study, post-study, and every 3-4 weeks throughout data collection. Questions centered around the caregiver's perceptions of their child's behavior, their confidence in addressing their child's CB, and their perceptions of the intervention. Caregivers were also prompted to give feedback on the app, the coaching procedures, and any additional recommendations. The caregiver's responses were used to adjust the coaching procedures (if needed) and to inform a more complete understanding of the family's experience with the intervention. See Appendix Q for the complete questionnaire.

Results: Phase 2

Data from the single-case study and embedded qualitative methods are reported either in isolation, mixed, or both, as appropriate. Quantitative results describe caregiver behavior (i.e., use of target intervention strategies) and child behavior (i.e., use of CB and RB) in response to research questions #3-5. Findings from embedded qualitative measures expand upon the quantitative results to present a holistic perspective on families' experiences with the intervention (research question #6).

We identified therapeutic changes in behavior for all three families, with idiosyncratic judgements regarding the presence or absence of a functional relation. Families reported their experiences with the intervention favorably, both throughout and after data collection.

Family 1

Figure 2 depicts the caregiver use of strategies across tiers for Family 1. While there were clear and consistent therapeutic changes in caregiver strategy use, we did not identify a functional relation since there are only two demonstrations of effect due to the lack of time-lag between the second and third tiers. As depicted in Figure 3, child use of CB decreased significantly after the onset of intervention and maintained at near-zero levels. Child use of RB (seen in Figure 4) increased and stabilized across the study. Average routine length was 9min 35sec for Family 1, with a standard deviation of 35sec and minimum session length of 8min 19sec.

Target Strategy 1: First-Then

Delia's use of First-Then was stable at zero during baseline. After the onset of intervention, rate of strategy use per minute immediately increased to 0.22, with a slight increasing trend maintaining throughout intervention. Rate ranged from 0.10 to 0.55 across intervention, with the final three data points stabilizing at 0.3-0.4. During maintenance, data were stable at levels consistent with intervention.

Target Strategy 2: Prompt "All Done"

Delia's use of the teach strategy was stable at low levels, ranging from 0 to 0.11 during baseline. After the onset of the intervention, rate of strategy use immediately increased to 0.22 and remained at that level throughout intervention.

Target Strategy 3: Positive Descriptive Feedback

Delia's use of positive descriptive feedback was stable at zero during baseline. After the onset of intervention, rate of strategy use immediately increased to 0.30 and maintained at levels higher than baseline, ranging from 0.11 to 0.22. Because Family 1 had plans to leave the country to visit family in Bolivia, we chose to intervene on two strategies at once to provide more robust support and did not fade coaching as originally intended.

CB

Sofia's use of CB was highly variable at low to moderate levels during baseline, ranging from 0% to 58% of the session across the condition. After the onset of intervention, data immediately decreased and with a decreasing trend throughout intervention. In the final five sessions of tier 1, data were at or near zero. In the final tiers, CB data remained low and stable at zero or near zero levels.

RB

Sofia's use of RB was stable at zero throughout baseline. Data remained low during the first tier of intervention, ranging from 0 to 0.10 RB per minute. During the final tiers, Sofia's use of RB increased slightly but remained low, ranging from 0.10 to 0.22 RB per minute. There is no overlap with baseline data.

Family 2

Figure 5 depicts the caregiver use of strategies across tiers for Family 2. We identified the presence of a functional relation between the intervention package and the caregiver's use of target intervention strategies, with three demonstrations of effect. Therapeutic changes were also identified for child use of CB (see Figure 6). We did not collect data on child use of RB for Family 2 because we did not intervene on the caregiver's use of teach strategies. Average routine length was 8min for Family 1, with a standard deviation of 1min 50sec and minimum session length of 4min 56sec.

Target Strategy 1: Transition Warnings

Valeria's use of transition warnings was stable at zero throughout baseline. After the onset of intervention, rate of strategy use immediately increased to moderate levels (*range* = 0.21 – 0.60). During maintenance, strategy use stabilized at moderate levels similar to intervention, with two low data points at or near zero (coinciding with the onset of intervention in tier 3). During fading, strategy use was stable at low levels.

Target Strategy 2: Positive Descriptive Feedback

Valeria's use of positive descriptive feedback was stable at zero throughout baseline. Immediately after the onset of intervention, rate of strategy use increased immediately to 0.21 and continued at moderate levels throughout intervention, ranging from 0.14 to 0.49. In maintenance and fading, rate of strategy use remained stable at moderate levels, similar to intervention, with an increasing trend across fading.

Target Strategy 3: Giving Choices

Valeria's use of choices was stable at zero throughout baseline. After the onset of the intervention, data increased immediately increased and remained at low to moderate levels throughout intervention. Rate of choices ranged from 0.12 to 0.34 across intervention. During fading, strategy use was variable, ranging from 0.0 to 0.40.

CB

David's use of CB was stable at moderate levels during baseline, ranging from 35% to 45% of the session. After introduction of the intervention, data immediately dropped to near zero levels for two sessions, before increasing to moderate levels again. In tier 2, data are variable with a decreasing trend at low levels. Percentage of CB ranged from 0 to 27% across the condition, and 0 to 10% in the final four sessions of tier 2. In tier 3 and during fading, data are low and stable at levels at or near zero throughout both conditions.

Family 3

Figure 7 depicts the caregiver use of strategies for Family 3. Mariela requested to withdraw from participation in the study during the first tier of intervention due to extenuating circumstances (i.e., job loss, family illness). As such, we did not identify the presence of a functional relation for any variables. There were therapeutic changes in both caregiver and child data (see Figure 8 for child use of CB). We did not collect data on child use of RB for Family 3. Average routine length was 8min 49sec for Family 3, with a standard deviation of 1min 45sec and minimum session length of 4min 35sec.

Target Strategy 1: First-Then

Mariela's use of First-Then was stable at zero during baseline. Immediately after the onset of intervention, rate of strategy use increased and maintained at moderate levels throughout the condition. Rate of strategy use ranged from 0.20 to 0.52.

CB

Ronaldo's use of CB was variable at moderate levels during baseline (range = 17.5 – 55.8%). During intervention, CB decreased and was variable at low levels, with some overlap with baseline.

Interobserver Agreement (IOA)

Interobserver agreement by family, variable, and condition is displayed in Table 8. IOA was collected for 40-50% of sessions, dependent upon the condition and variable, for Family 1, 33-50% of sessions for Family 2, and 50% of sessions for Family 3. Agreement between observers ranged from 50% to 100%, dependent upon the condition, family, and behavior. Mean agreement across variables and conditions was 97.4% for Family 1, 93.5% for Family 2, and 94.2% for Family 3.

Procedural Fidelity (PF)

Procedural fidelity was collected for each Zoom session (i.e., pre-baseline sessions, BST, coaching check-ins) with each family, and for the coaching communication (e.g., text messaging) with families throughout the study. PF was 100% for Family 1 for coaching sessions, and 98% for coaching communication with Family 1. PF was 97% for Family 2 for coaching sessions, and 100% for coaching communication for Family 1. PF was 100% for Family 3 across all components.

Social Validity

Responses to the social validity questionnaire at pre-study, during, and post-study for all three families are displayed in Tables 9-12. Tables 9, 10, and 11 display the results of the ongoing questionnaire used throughout data collection for Families 1, 2, and 3 respectively. Table 12 displays the results of the post-study questionnaire for all three families.

Overall, all families indicated a high level of satisfaction with the FBSApp and collaborative coaching, both throughout and after study procedures. Valeria (Family 2) reported on the questionnaire

during Tier 2 of intervention: “I think we are doing better in the routine. More than educating the child, it is educating oneself to know how to use words and help [the child] make the routine.” Toward the end of Tiers 2 and 3 for Family 1, Delia said that she was “very satisfied with the support.” During data collection, all three families consistently reported being satisfied or very satisfied with the FBSApp and collaborative coaching.

From pre- to post-study, Delia reported an increase in confidence in preventing and responding to Sofia’s CB, an increase in satisfaction with their relationship, and a reduction in Sofia’s overall use of CB. While Mariela requested to end the study early, she also reported a reduction in Ronaldo’s use of CB, an increase in confidence in preventing Ronaldo’s CB, and an increase in confidence teaching Ronaldo to communicate in replacement of CB. Valeria reported an increase confidence in preventing and responding to David’s CB, an increase in confidence in teaching David to communicate in replacement of CB. She also reported a reduction in David’s use of CB, a reduction in the impact of his CB, and an increase in satisfaction with their relationship. All three families reported the intervention to be very appropriate for Spanish-speaking families.

Results: Mixed Methods

As stated, quantitative methods were based on data collected and analyzed in the initial qualitative phase, and quantitative results were based on visual analysis of single-case data. The mixed methods findings presented here represent the integration of quantitative and qualitative data and the interpretations of these merged data.

Recommended Adaptations to the Intervention

In alignment with the first research question, data across Phases 1 and 2 point to specific adaptations to support the efficacy, usability, and feasability of the intervention when utilized with Spanish-speaking families. These adaptations included: (1) matched language and culture, represented in both the FBSApp and the collaborating coach; (2) individualization to the family unit’s unique values, needs, and preferences; (3) adaptation of language to be culturally appropriate and accessible for families, and (4) an attitude of cultural humility and awareness on the part of the coaching team.

Stakeholders’ Perception of the Intervention

In alignment with the second research question, data across Phases 1 and 2 highlight the cultural responsiveness, effectiveness, usability and feasability of the intervention package for Spanish-speaking families of young children with CB. Feedback from professionals, focus group families, and single-case families was overwhelmingly positive, with all participants expressing an appreciation for and willingness to utilize the FBSApp Español. All three families consistently reported satisfaction with the FBSApp Español and the coaching procedures during and after data collection. None of the participants recommended any additional adaptations or adjustments to the intervention specific for Spanish-speaking families, including single-case participants, whose data demonstrated a clear therapeutic change in both child and caregiver behaviors. Overall, the qualitative and quantitative data indicate the FBSApp Español paired with collaborative coaching to be a feasible, effective, usable, and culturally responsive intervention.

Recurring Theme: Continued need for culturally appropriate, flexible supports and services for Spanish-speaking families

Across both phases, one key theme emerged from both the qualitative and quantitative data that was not directly relevant to answering our initial research questions. We determined these findings to be important to include in our final analysis given the relevance to the field and the study at hand.

Both family members and professionals expressed a strong need for services that were flexible and responsive to individual families’ needs, and especially so for Spanish-speaking families in the U.S. and worldwide. Gabriel said, in reference to a family member with a child with ASD living in Colombia,

"access to these therapies is much more expensive…so it will be very good for families to have this type of application." Another caregiver, Valentina, said, "my child has not yet been evaluated…so we do not have the opportunity to contact a person who has experience in this area. I like that [in the app] we can contact someone who is an expert in this area." These perspectives highlight the need to present supports to families in diverse methods, formats, and modalities to maximize the likelihood that caregivers will (1) come into contact with the information in the first place, and (2) understand and apply the information in their daily lives.

Every professional reported having to translate curricula, paperwork, and other materials into Spanish "on the fly" and Alma "even [translated many] documents that were 'official'" (e.g., IEPs, medical records, court summons). Andrea reported that, throughout her nine years of experience, she had "never used a curriculum specifically made for Hispanic or Latino families." Professionals also emphasized taking extra time to "incorporate families' feedback," "use examples that relate to [the caregivers'] kids," and "gauge how much they know and then go from there." This need for individualized supports extended beyond language and culture, with several professionals and caregivers pointing toward the fact that "every family has their own subculture." One professional reported, "Just because they speak Spanish and they're Hispanic doesn't mean they're going to be a specific way or culture…they each have their own culture. It's not always going to be that every family follows a certain routine or values some particular thing." This points toward not only the importance of education and awareness of cultural norms, but toward a greater overall need for professional who work with families to be able and willing to adapt and support in a responsive and flexible manner.

This need for flexibility was reiterated by families in focus groups and in the single-case study as well. In response to a question about the appropriateness of the procedures for Spanish-speaking families, one caregiver said, "I don't think it's a problem with cultural things, like with language. I think it's more a matter of family dynamics, because…there are families who have more time or dedication for being full time with children and some others don't." In the member checking survey, Valeria (Family 2) mentioned both that she "loved having a coach" and that she was glad to have continued access to the app in the future, "since sometimes I forget to continue praising or the precise steps we discussed to carry out the routine." Tools that can guide both service providers and families in addressing young children's use of CB, while being flexible to the needs of both, such as the FBSApp, are sorely needed and will continue to be a relevant area of research, policy, and practice.

Discussion

This mixed methods study involved developing, adapting, and evaluating a culturally responsive intervention package for Spanish-speaking families of young children with disabilities and CB. Mixing methods allowed us to draw a comprehensive picture of how to adapt and implement our intervention, and how relevant stakeholders perceived the intervention. The main findings from this study suggested that: (1) culturally-informed interventions and supports are needed, with individualization to each discrete family unit's sub-culture of high priority; (2) the FBSApp Español paired with collaborative coaching might be an accessible, responsive, and effective option for providing support to families in naturally-occurring contexts.

There were several key adaptations that emerged from the data collected in semi-structured interviews and focus groups in Phase 1. These adaptations included: (1) matched language and culture, represented in both the FBSApp and the collaborating coach; (2) individualization to the family unit's unique values, needs, and preferences; (3) adaptation of language to be culturally appropriate and accessible for families, and (4) an attitude of cultural humility and acceptance on the part of the coaching team. When utilizing these key adaptations to our intervention during the quantitative phase of study, both observational and caregiver-reported data indicate improved outcomes for both the child and

the caregiver during the target routine. Taken together, these results support the efficacy and usability of the recommended cultural adaptations.

All three families who participated in Phase 2 demonstrated observable positive changes in behavior for both caregiver and child data, with a functional relation identified for one family. Increases in caregivers' use of the target intervention strategies were present across all seven opportunities for demonstrations of effect, with corresponding decreases in both children's use of CB. Data regarding child use of RB were inconclusive. All families indicated satisfaction with the FBSApp and the coaching procedures during and after data collection, according to caregiver questionnaire. All three families reported an increase in confidence addressing their child's use of CB from pre- to post-study, and a high degree of satisfaction with the FBSApp and the coaching procedures. Taken together, these findings are promising initial evidence supporting the effectiveness, usability, and feasability of the FBSApp Español paired with collaborative coaching via telehealth.

Individual Differences

Importantly, despite an overarching positive response, participants' (i.e., caregivers and professionals) responses to the FBSApp were idiosyncratic. For example, some professionals and caregivers described the FBSApp as "easy to read and family-friendly," whereas others gave suggestive feedback to improve the navigability and ease of use. In the single-case study, families' preferences for coaching were different, and their responses to intervention varied as well. For example, Family 1 wanted to spend more time in tier 1 to get more practice with that specific strategy, whereas Family 2 wanted to change conditions as soon as possible to have access to more strategies. Families 1 and 2 elected to receive coaching via text message (i.e., WhatsApp), where Family 3 chose to receive coaching via Zoom. This distinctive response to the same intervention has been observed in previous research both within (Koegel et al., 1998; Moes & Frea, 2002) and across studies (Fettig & Barton, 2014).

Further, the importance of individualization was a theme that thread throughout our qualitative and quantitative data, highlighted by both professionals and families. By following this thread (Moran-Ellis et al., 2006), we identified key opportunities for family choice in our intervention, including (1) the context of intervention; (2) the timing and delivery method of coaching; and (3) the target strategies and behaviors under intervention. We believe that this individualization directly contributed to the positive outcomes Families 1 and 2 experienced, both qualitatively and quantitatively. Future research, especially in the realm of parent coaching interventions and cultural adaptations to such interventions, should continue to refine and evaluate methods for intentionally incorporating individual (or group) preferences and values, without compromising the external and internal validity of the interventions (Wang & Lam, 2017). We echo the sentiments of Meadan and colleagues, that "when partnering with families to conduct research, considerations beyond research methodologies…are necessary" (Meadan et al., 2019, pp. 504).

Finally, it is also important to note that Family 3 requested to end their participation in the study early. Mariela specifically cited "chaotic schedules" after her husband's job loss, and difficulty prioritizing the task of recording observations during mealtime. She reported (both during the final coaching session and in the post-study survey) a high degree of satisfaction with the intervention and with her participation in the study. However, the study procedures were ultimately not feasible for the family given the circumstances. This is important to consider in conjunction with the family's observational and qualitative data, and in consideration with the other two families' experiences in Phase 2 of the study.

Implications for Research

With this study, we present an actionable model for employing Domenech Rodriguez and colleagues' Cultural Adaptation Process model (2004) to an existing behavioral intervention tool. This

practice of adapting existing interventions or treatment models has been recommended by researchers in the educational, medical, and mental health field (Bernal et al., 1995; Kazdin, 2007; Okafor et al., 2019). While the literature base around interventions that have been translated and tested with culturally and linguistically diverse populations is growing, the process of culturally adapting such interventions (beyond simple language translation) is still new to the field (DuBay et al., 2022). There is wide variation amongst published studies in the ways the cultural adaptation process is applied and tested, with varying degrees of involvement of the target community, methodological rigor in evaluating such adaptations, and transparency in the reporting process. Our study presents a comprehensive picture of the adaptation process, with recommendations for further development and evaluation.

To our knowledge, there are no published mixed methods studies incorporating both qualitative and single-case research design components as we did in the current study. There are limited single-case mixed methods studies present in the literature; what is published primarily focuses on single participant case studies outside the field of education (e.g., Ramos & Ramos, 2019; Harbin & Fettig, 2023). Given the highly individualized nature of single-case research, mixing methodologies to provide a richer and more nuanced picture of the phenomenon under study can help the field continue to produce research grounded in complex, real-world contexts that improve educational practice (Corr et al., 2020). We recommend that researchers continue to explore mixed methods research as an avenue for moving "beyond questions of 'what works' to questions of 'what works with whom, by whom, in what contexts, under what circumstances, and for what purposes?'" (Klingner & Boardman, 2011, pp. 209).

The current study provides evidence supporting the feasibility of the FBSApp paired with collaborative coaching; however, while the collaborative coaching procedures are built upon the FBSApp and embedded materials and resources, it is not yet possible to know exactly what the active ingredients are in our intervention, and how significant or insignificant the role of the app versus coaching is in families' outcomes. Future work could continue to parse out the potential impact of the FBSApp alone, collaborative coaching alone, and the FBSApp paired with collaborative coaching. It is possible that these results might be idiosyncratic according to family preference, but it is also possible that the FBSApp alone might be an effective tool for some, or with less intensive coaching supports. This could be a promising avenue for supports for diverse populations of families across the globe.

The population involved in this study focused narrowly on Spanish-speaking individuals of Latin American descent currently living in North America. This same process of applying, evaluation, re-applying, and re-evaluating cultural adaptations to an existing intervention package can be utilized to extend the reach of the FBSApp paired with collaborative coaching–and other research-backed interventions–to other diverse populations. For example, the 2020 U.S. Census found that Asian-Americans were the fastest growing minority group, with a population expected to reach over 25 million by 2040 (Pew Research Center, 2021). We are hopeful that future research will continue to address the needs and values of culturally and linguistically diverse families and children, in the United States and globally.

Implications for Practice

The findings from this study contribute to a larger literature base supporting responsive, family-centered interventions for coaching diverse caregivers to intervene on young children's challenging behaviors in naturally-occurring contexts. Our central recommendation for practitioners working with families of young children, regardless of demographic background, is to take steps to actively collaborate and build partnership with families before, during, and after implementation of intervention. Ideally, practitioners should start with interventions that have been adapted and validated with a population that aligns with their target family's culture; however, they can utilize a simplified version of the Cultural Adaptation Process model to adapt evidence-based interventions to each individual family's

unique sub-culture. Practitioners can then individualize target routines, target behaviors, and intervention strategies to uniquely suit the families' needs, priorities, and strengths.

Further, practitioners should actively reflect on their own beliefs and expectations, using a framework of cultural humility. Developing an awareness of one's own learning culture, beliefs, and biases is a necessary to facilitate recognition and correction of any potentially inaccurate assumptions or misaligned goals that may impact outcomes for child and family. Ongoing training should be provided to early interventionists, behavior therapists, and mental health service providers both on the unique nuances of diverse cultures, incorporating an attitude of cultural humility into their own practice, and collaborating with families to personalize intervention plans.

Limitations

There are several important limitations to note. First, collaborative coaching was provided by members of the research team who were pursuing advanced graduate degrees. The two primary coaches were master's level graduate students with 2-4 years of experience with function-based supports, parent coaching, and education in both English and Spanish; the supervising coach was a doctoral-level graduate student with six years of experience with the FBSApp and four years of experience coaching families in using the FBSApp. Future research should explore the feasibility and effectiveness of the intervention package when implemented by professionals outside of the original research team, with a variety of formal experiences and/or education levels.

Further, our sample size across all phases of the study was small and is not representative of the depth and breadth of Spanish-speakers on the North American continent alone, much less the globe. It is well-documented that culture is fluid and dynamic (Farver et al., 2002; Ryder et al., 2008), especially when considering a language spoken in such a wide geographic distribution as Spanish (Garcia, 2017; Torres & Solberg, 2021). It is likely that, for families from or living in European Spanish-speaking countries, further language and cultural adaptations might be necessary to maintain the effectiveness and responsiveness of the intervention. We also did not delve deeply into the impacts of acculturation, not to mention socio-economic status or level of education, all of which have been shown to intersect with culture in unique and impactful ways (Rodríguez et al., 2002). Future research should continue to explore effective ways of addressing these nuances and their role in adapting and evaluating family-centered behavioral interventions.

Another limitation is that agreement between observers was occasionally lower for variables that were low rate, free operant, and requiring more inference-based decisions (e.g., caregiver strategy use; Yoder et al., 2018). Further, data were collected by individuals who were not masked to study condition or purpose, which introduces the potential for systematic observer bias (Ledford et al., 2018). We strongly recommend graphing primary and secondary data on the same graph during data collection, which allowed us to observe important differences across observers and gather more information about patterns of agreement and disagreement. We also used momentary time sampling (MTS) to estimate child use of CB. While MTS sacrifices less accuracy than other interval sampling systems, such as partial and whole interval recording, it has been shown to induce variability and produce inaccurate estimations of count (Ledford et al., 2015). When using MTS, we echo other researchers' recommendations to use an interval size that closely approximates the duration per occurrence of the behavior (e.g., Ledford et al., 2015).

Conclusions

Challenging behaviors are a major concern for families of young children with disabilities, and especially so for families who are historically underserved and underrepresented. We have presented an iterative process of adapting and evaluating an existing intervention for a culturally and linguistically diverse population, yielding positive results for the families involved. Our mixed methods approach

allowed for an empirically- and experientially-founded intervention, which contributed to a more thorough understanding than qualitative or quantitative methods in isolation. More research is needed to continue to explore processes of identifying and applying cultural adaptations for diverse populations, and to refine systematic methods of individualization to discrete family units that extend beyond broad cultural assumptions. We are hopeful that practitioners and researchers alike will continue to embrace an responsive approach with families of young children with disabilities that is both systematic and rigorous, while honoring the validity and significance of their experiences and values.

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Table 1

Demographic Information of Semi-Structured Interview Participants

Name	Location	Current role	Previous roles	Years of experience	Race / ethnicity	Bilingual?
Cristina	Monterrey, MX	BT	-	2	Mexican	Yes
Alma	Fort Walton Beach, FL	EI	Teacher, ITDS	13	Mexican	Yes
Addison	Austin, TX	RA	BT	5	Hispanic	Yes
Rachel	Nashville, TN	EI	-	5	White	No
Antonia	Nashville, TN	RA	BT	3	Hispanic/Latino, White	Yes
Andrea	Seattle, WA	Student, RA	BCBA	10	Latina	Yes

Note. MX = Mexico; FL = Florida; TX = Texas; TN = Tennessee; WA = Washington; BT = behavior technician; EI = early interventionist; RA = research assistant; ITDS = infant/toddler developmental specialist.

Table 2

Demographic Information of Focus Group Participants

Name	Current Location	Country of origin	Child's diagnosis
Martina	Monterrey, MX	Mexico	LD
Margarita	Montreal, CA	Venezuela	ASD
Gabriel	Monterrey, MX	Mexico	LD
Camila	Monterrey, MX	Mexico	ASD
Bianca	Monterrey, MX	Mexico	ASD
Valentina	Houston, TX	El Salvador	LD
Marina	Monterrey, MX	Mexico	ASD
Sylvia	Monterrey, MX	Mexico	ASD, ADHD
Delia	Honolulu, HI	Bolivia	ASD, DD, LD
Carmen	Monterrey, MX	Mexico	DD
Valeria	Seattle, WA	Mexico	LD
Maya	Nashville, TN	Mexico	DD

Note: MX = Mexico; CA = Canada; TX = Texas; HI = Hawaii; WA = Washington; TN = Tennessee; LD = language delay; ASD = autism spectrum disorder; ADHD = attention-deficit/hyperactivity disorder; DD = developmental delay.

Table 3

Qualitative Data from Semi-Structured Interviews

Themes and Sub-Themes	**N = 285**
Culturally specific adaptations for Hispanic/Latino families	**48**
Translation of language into Spanish	9
Awareness of own's own cultural background	3
Considering the role of deference to authority	2
Education on U.S. customs (explicit and implicit)	9
Replacements for physical punishment	5
Including the entire family unit	6
Addressing stigma around disability and autism	14
Family-centered adaptations not specific to Hispanic/Latino culture	**47**
Adaptations to language to minimize jargon and maximize understanding	12
Simplifying content and/or procedures	6
Individualization to family's routines and/or schedule	11
Individualization to the family's goals and/or priorities	10
Providing additional resources	8
Perception of the intervention (FBSApp)	**105**
Positive feedback: Generic	18
Positive feedback: Strategies	12
Positive feedback: Videos	8
Positive feedback: Infographics	6
Positive feedback: Ease of use	11
Positive feedback: Pairing with professional support	7
Positive feedback: Independent access for families	9
Suggestive feedback: Readability of infographics	6
Suggestive feedback: Wording / phrasing / language	12
Additive feedback: Resources around developmental appropriateness	8
Additive feedback: Resources around basic needs	3
Additive feedback: Autism resources	5
Perception of the intervention (collaborative coaching)	**34**
Positive feedback: Generic	9
Positive feedback: Individualization to families	8
Positive feedback: Incorporating feedback	3
Positive feedback: Modalities of communication	2
Positive feedback: Communicating rationale behind strategies	5
Suggestive feedback: Considering deference to authority	4
Suggestive feedback: Concerns around minimizing attention	3
Recurring themes across questions	**51**
Family individualization over cultural assumption	8
Necessity of individualization	23
Importance of accessible language	13
Families need reassurance	7

Note. Righthand column represents frequency of statements coded.

Table 4

Qualitative Data from Focus Groups

Themes and Sub-Themes	**N = 99**
Perception of the intervention (FBSApp)	**45**
Positive feedback: Generic	2
Positive feedback: Videos	2
Positive feedback: Culturally responsive	4
Positive feedback: Strategies / BSP	4
Positive feedback: Collaboration	2
Positive feedback: Visual components	4
Positive feedback: Flexibility / individualization	4
Positive feedback: Pairing with professional support	2
Positive feedback: Availability for those with less access to resources	5
Suggestive feedback: Embed research	1
Suggestive feedback: Navigability	2
Suggestive feedback: Language	1
Suggestive feedback: Android version	6
Suggestive feedback: More individualization	6
Perception of the intervention (collaborative coaching)	**9**
Positive feedback: Generic	3
Positive feedback: Importance of support in naturally-occurring contexts	4
Positive feedback: Supporting with collecting data	2
Recurring themes across questions	**45**
Family individualization over cultural assumption	3
Desire for flexible supports	14
Key element of individualization: how much time can the caregiver give?	8
Need to improve app user experience and navigability	10
Need for services for Spanish-speaking families	10

Note. Righthand column represents frequency of statements coded.

Table 5

Demographic Information of Single-case Study Participants

Caregiver							Child			
Name	**Age (years)**	**Occupation**	**Race / ethnicity**	**Country of origin**	**Education**	**Location**	**Name**	**Age (months)**	**Diagnosis**	**Race / ethnicity**
Delia	41	Homemaker	Hispanic	Bolivia	Bachelor's	Honolulu, HI	Sofia	25	ASD, DD, LD	Hispanic
Valeria	29	Homemaker	Hispanic	Mexico	Less than HS	Seattle, WA	David	39	LD	Hispanic
Mariela	32	Lawyer	White / Hispanic	Mexico	Master's	Monterrey, MX	Ronaldo	37	ASD, ADHD	White / Hispanic

Note. HS = high school; WA = Washington; HI = Hawaii; MX = Mexico; ASD = autism spectrum disorder; DD = developmental delay; LD = language delay; ADHD = attention-deficit/hyperactivity disorder.

Table 6

Operational Definitions of Challenging Behavior

Behavior	Definition	Example	Non-example
Verbal aggression (Family 1, 3)	The child produces a disruptive, audible noise that may include intelligible words and/or sounds to communicate protest or negative feelings.	Child screams when their parent tells them no.	Child screams excitedly when their parent comes in the room.
Physical aggression (Family 1)	Any forceful contact or attempts at contact between (a) the child's body or object the child is holding, and (b) another person's body or an object that is not contextually appropriate.	Child swats at caregiver, but caregiver moves and child does not make contact.	Child claps their hands together forcefully while laughing when caregiver tickles them.
Elopement (Family 2, 3)	The child leaves the area without permission when expected to remain in the area, or moves in the opposite direction of compliance when given instructions.	Child gets up and leaves the table during dinner.	Child stands still when caregiver gives demand.
Noncompliance (Family 2, 3)	Any verbal refusal (e.g., "No!") to comply with an adult directive OR lack of physical compliance within 10s after the end of the directive	Child continues to watch TV when caregiver says, "Time to brush teeth!"	Child shakes head but walks to the bathroom when told, "Time to brush teeth!"
Self-injury (Family 2)	Any forceful physical contact or attempts at contact between (a) the child's body, and (b) an object or another part of the child's body that is not contextually appropriate.	Child smacks their hand against their cheek and says, "Ow."	Child claps their hands together forcefully while laughing when caregiver tickles them.

Table 7

Operational Definitions of Target Strategies

Strategy	Definition	Example	Non-Example
First/Then (Family 1, 3)	Caregiver provides a verbal or visual cue of, "First __, then __," regarding upcoming activities. Must include the word "first" **or** "then," where the first activity is a task or demand and second activity is a preferred activity or reinforcer.	"First bath, then a song" "We're going to eat dinner, then you can have ice cream."	"First bath, then brush teeth." "Dinner, bath, brush teeth, then bed."
Ask to be done (Family 1)	Caregiver verbally or gesturally prompts child to ask to be "all done" or to not do something. Must include a clear indication of what the child can do to get out of the task.	Caregiver models the sign for 'all done.' Caregiver asks, "More, or all done?"	Caregiver says, "You can be all done," when child starts to cry.
Positive descriptive feedback (Family 1, 2)	Communication from the caregiver to the child indicating positive feedback for a specific behavior the child demonstrated. Must include **both**: 1. Positive language (good job, way to go), and 2. Description of the child's behavior (following directions, sitting down)	"Thanks for putting away toys!" "I'm proud of you for listening to directions."	"Great job!" "I am proud of you."
Transition warnings (Family 2)	Caregiver prepares the child for an upcoming change (ending or beginning of an activity) by providing a verbal or gestural cue. Must include a description of the duration (e.g., 1 more minute) or amount (e.g., 1 more turn) before the change	"After one more push, we're all done swinging."	"Time to go to bed!" "Next we're going to the park."
Give choices (Family 2)	Caregiver presents child with two or more possibilities of items, activities, people, food, etc. Must **NOT** be punitive in nature.	"Do you want a sandwich or noodles?"	"Do you want to clean up or go to time out?"

Table 8

Mean IOA by Condition, Variable, and Family

	Family 1				
	TS 1	**TS2**	**TS3**	**CB**	**RB**
Baseline	100%	100%	100%	97.1% (95-98)	100%
Tier 1	88.9% (66-100)	100%	91.7% (50-100)	98% (96-99)	100%
Tiers 2 + 3	100%	100%	100%	99% (97-100)	100%
	Family 2				
	TS1	**TS2**	**TS3**	**CB**	
Baseline	100%	100%	100%	80.5% (79-81)	
Tier 1	89.6% (75-100)	100%	100%	89.6% (87-92)	
Tier 2	86.7% (60-100)	86.7% (66-100)	100%	91.1% (85-96)	
Tier 3	100%	100%	75% (50-100)	98.7% (97-100)	
Fading	100%	100%	100%	92.4%	
	Family 3				
	TS 1			**CB**	
Baseline	100%			91.4% (88-95)	
Tier 1	90.2% (80-100)			94.5% (90-99)	

Note. TS = Target Strategy; CB = challenging behavior.

Table 9

Ongoing Questionnaire Results for Family 1

	Pre-Study	Baseline	Tier 1	Tiers 2 + 3	Post-Study
1. How satisfied are you with your relationship with your child?	Somewhat satisfied (4)	-	-	-	Very satisfied (5)
2. How often does your child engage in CB?	Daily (4)	A few times / day (5)	Daily (4)	Daily (4)	A few times / week (3)
3. How much does this behavior negatively impact your life?	Significant impact (4)	Moderate impact (3)	Moderate impact (3)	Moderate impact (3)	Some impact (2)
4. How confident do you feel preventing your child's CB?	Somewhat confident (4)				Very confident (5)
5. How confident do you feel teaching your child to communicate?	Very confident (5)	Somewhat confident (4)	Somewhat confident (4)	Very confident (5)	Confident (4)
6. How confident do you feel responding to your child's CB?	Not very confident (2)				Very confident (5)
7. To what extent does your child appropriately communicates their wants and needs?	Not very often (2)	-	-	-	Sometimes (3)
8. How satisfied do you feel with the FBSApp?	-	Very satisfied (5)	Very satisfied (5)	Very satisfied (5)	Very satisfied (5)
9. How satisfied to you feel with the coaching you've received so far?	-	Very satisfied (5)	Very satisfied (5)	Very satisfied (5)	Very satisfied (5)
10. Is there anything you would change about the support you're receiving?	-	No	No	No	No

Note. During data collection, questions 4-6 were merged into one ("How confident do you feel addressing your child's CB?")

Table 10

Ongoing Questionnaire Results for Family 2

	Pre-Study	Baseline	Tier 1	Tier 2	Tier 3	Post-Study
1. How satisfied are you with your relationship with your child?	Neutral (3)	-	-	-	-	Very satisfied (5)
2. How often does your child engage in CB?	Daily (4)	A few times / day (4)	A few times / week (3)	A few times / week (3)	A few times / week (3)	A few times / week (3)
3. How much does this behavior negatively impact your life?	Significant impact (4)	Moderate impact (3)	Moderate impact (3)	Moderate impact (3)	Moderate impact (3)	Moderate impact (3)
4. How confident do you feel preventing your child's CB?	Not very confident (2)					Very confident (4)
5. How confident do you feel teaching your child to communicate?	Not very confident (2)	Not very confident (2)	Somewhat confident (3)	Confident (4)	Confident (4)	Very confident (4)
6. How confident do you feel responding to your child's CB?	Not confident at all (1)					Somewhat confident (3)
7. To what extent does your child communicates their wants and needs appropriately?	Not very often (2)	-	-	-	-	Often (4)
8. How satisfied are you with the FBSApp?		Very satisfied (5)	Satisfied (4)	Satisfied (4)	Very satisfied (5)	Very satisfied (5)
9. How satisfied are you with the coaching you've received?		Very satisfied (5)	Satisfied (4)	Satisfied (4)	Very satisfied (5)	Very satisfied (5)
10. Is there anything you would change about the support you're receiving?		No	No	Yes – "More about transitions to go to the supermarket?	No	No

Note. During data collection, questions 4-6 were merged into one ("How confident do you feel addressing your child's CB?")

Table 11

Ongoing Questionnaire Results for Family 3

	Pre-Study	Baseline	Tier 1	Post-Study
1. How satisfied are you with your relationship with your child?	Very satisfied (5)	-	-	Very satisfied (5)
2. How often does your child engage in CB?	Multiple times per day (5)	Multiple times per day (5)	Daily (4)	Daily (4)
3. How much does this behavior negatively impact your life?	Significant impact (4)	Significant impact (4)	Moderate impact (3)	Moderate impact (3)
4. How confident do you feel preventing your child's CB?	Not very confident (2)			Somewhat confident (4)
5. How confident do you feel teaching your child to communicate?	Not very confident (2)	Not very confident (2)	Neutral (3)	Neutral (3)
6. How confident do you feel responding to your child's CB?	Not very confident (2)			Not very confident (2)
7. To what extent does your child communicates their wants and needs appropriately?	Not very often (2)	-	-	Sometimes (3)
8. How satisfied are you with the FBSApp?		Satisfied (4)	Satisfied (4)	Satisfied (4)
9. How satisfied are you with the coaching you've received?		Neutral (3)	Very satisfied (5)	Very satisfied (5)
10. Is there anything you would change about the support you're receiving?		No	No	No

Note. During data collection, questions 4-6 were merged into one ("How confident do you feel addressing your child's CB?")

Table 12

Post-Study Questionnaire Results for All Families

Question	Family 1	Family 2	Family 3
1. How satisfied are you with the FBSApp?	Very satisfied (5)	Very satisfied (5)	Satisfied (4)
2. How satisfied are you with the coaching you've received?	Very satisfied (5)	Very satisfied (5)	Very satisfied (5)
3. How likely are you to use the FBSApp in the future?	Very likely (5)	Very likely (5)	Very likely (5)
4. How likely are you to recommend the FBSApp to other families?	Very likely (5)	Very likely (5)	Very likely (5)
5. What was the most useful aspect of participating in this study?	"Learning new and good strategies"	"Having personal coaching adapted to the needs of my family"	"Coaching"
6. What was the most useful component of the FBSApp?	"The videos and strategies"	"The graphs and the Universal Strategies page"	"The strategies"
7. What was the least useful aspect of participating in this study?	"NA"	[blank]	[blank]
8. How appropriate do you feel the FBSApp + coaching procedures are for Spanish-speaking families of young children?	Very appropriate (5)	Very appropriate (5)	Very appropriate (5)
9. What changes, if any, would you make to the app or coaching procedures?	"Nothing"	"Being able to change plans when one is already working for you"	"The app was sometimes glitchy and hard to use."
10. Is there anything else you'd like for us to know?	"I am very happy with the coaching that I got and I hope to participate again in the future. My coaches were the best!"	"I loved having a coach and bring able to have meetings to see what we are doing well and where we can improve."	"The strategies are great! Recording videos was hard. I would've liked to keep going!"

Figure 1.

Mixed Methods Design

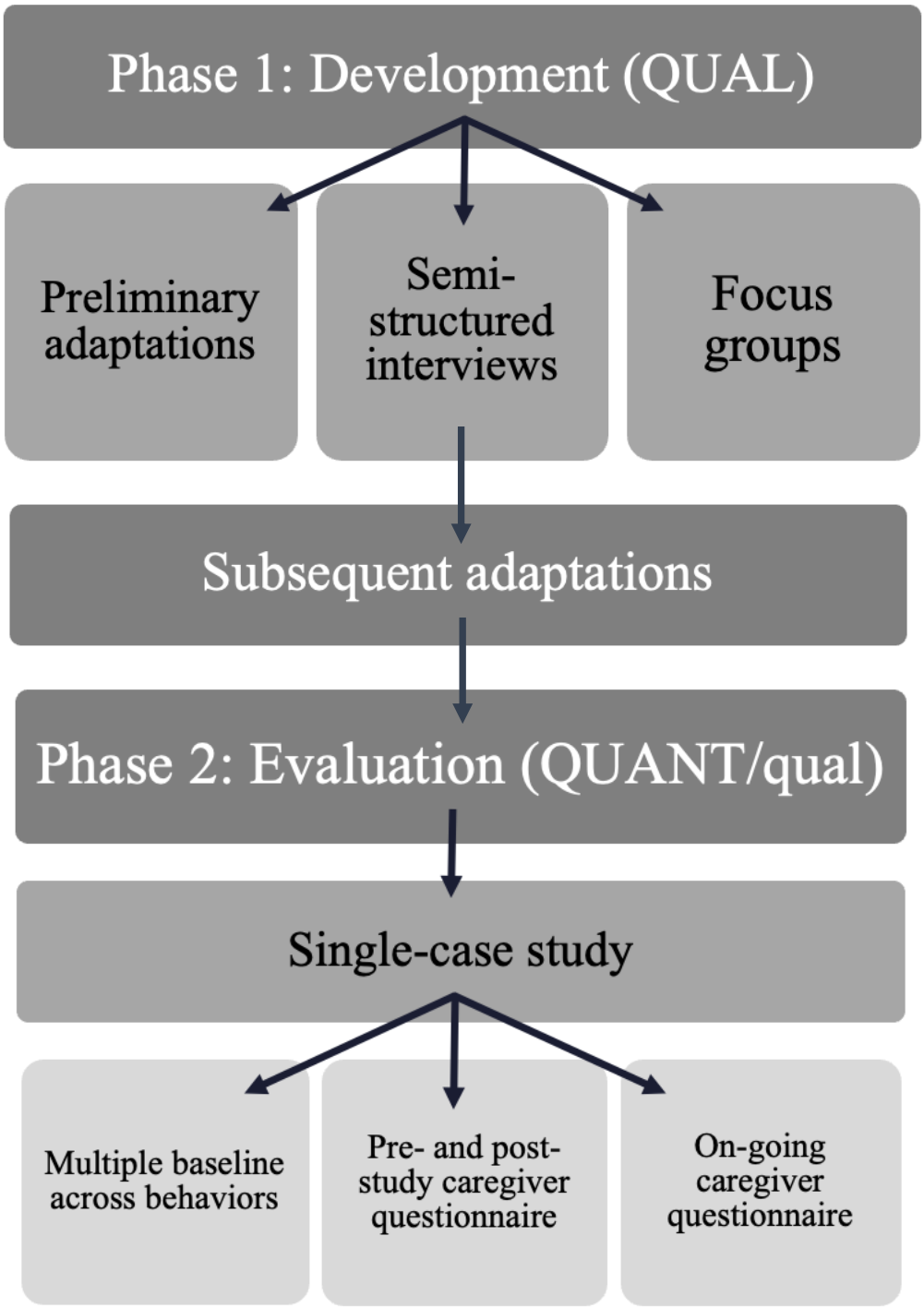


Figure 2

Qualitative Coding Steps

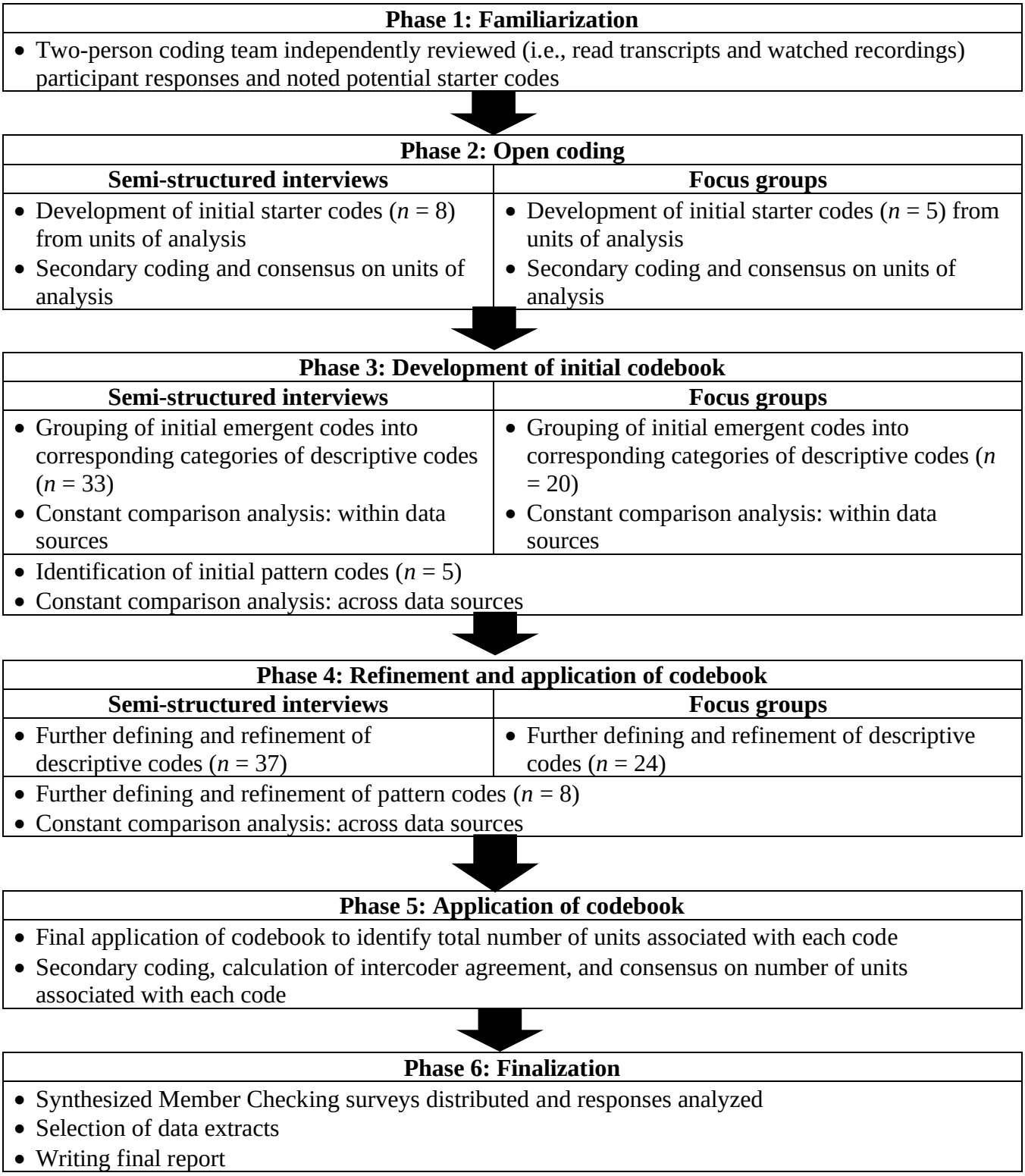


Figure 3

Delia's Use of Target Intervention Strategies (Family 1)

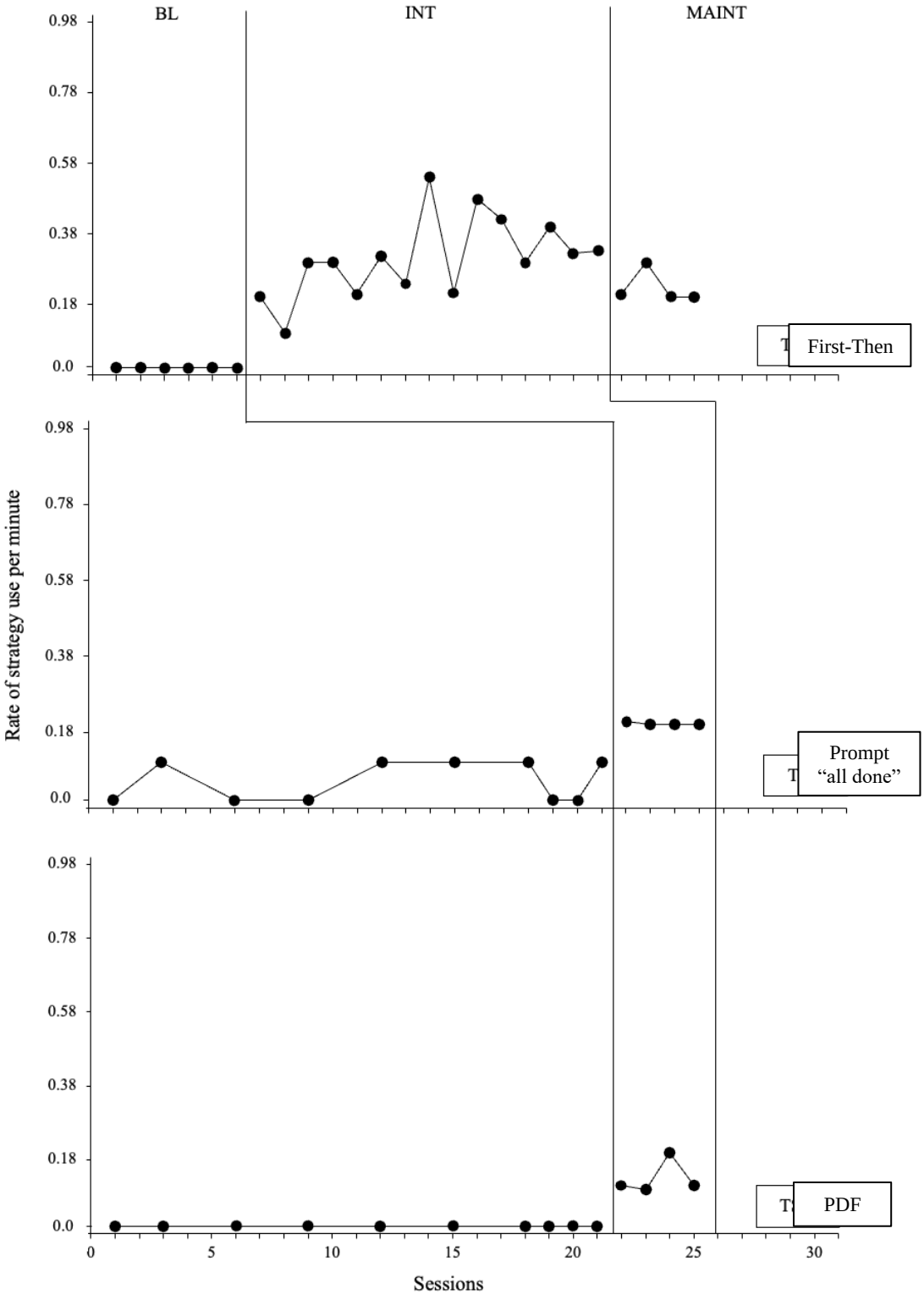


Figure 4

Sofia's Use of Challenging Behaviors (Family 1)

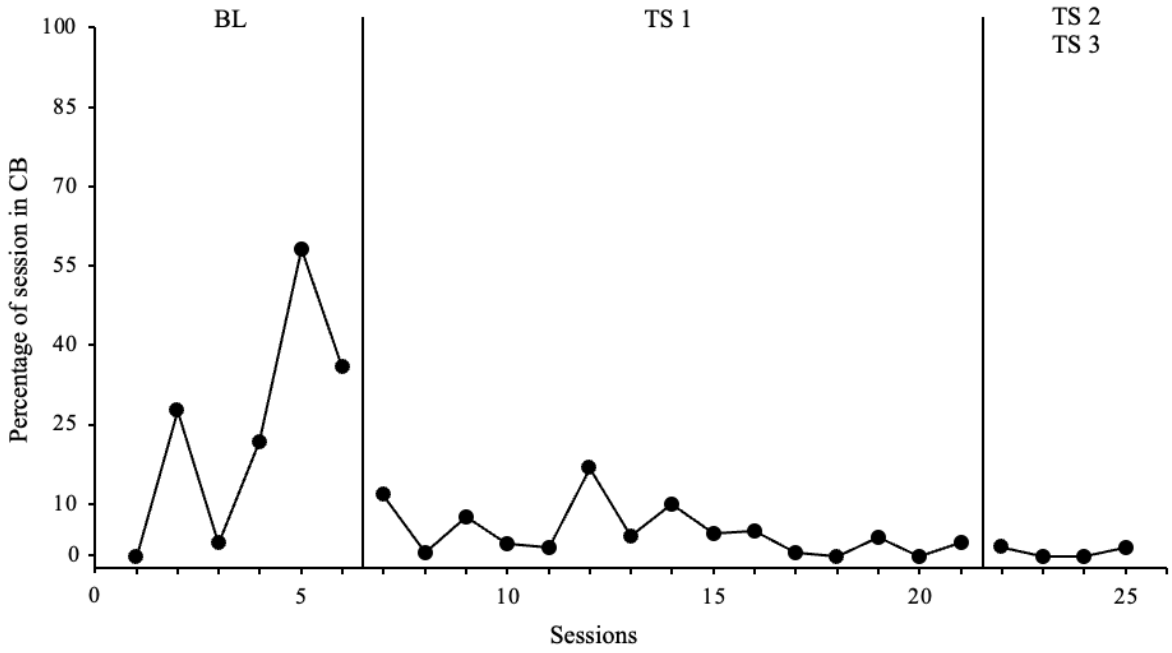


Figure 4

Sofia's Use of Replacement Behaviors (Family 1)

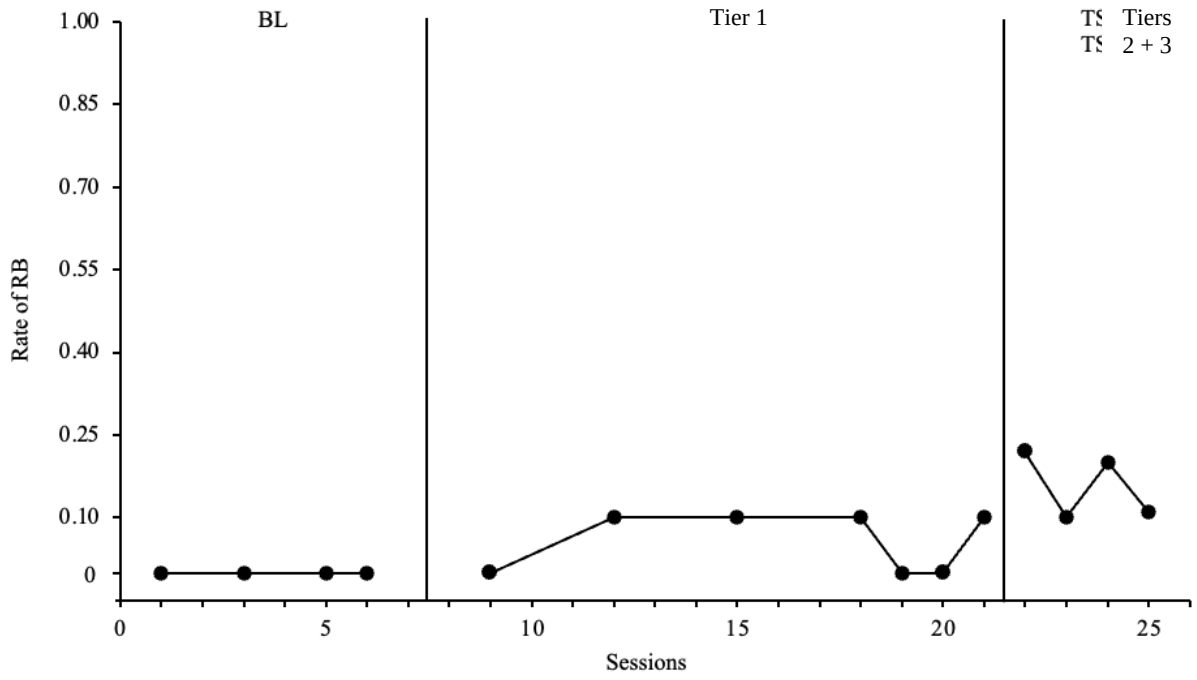


Figure 5

Valeria's Use of Target Intervention Strategies (Family 2)

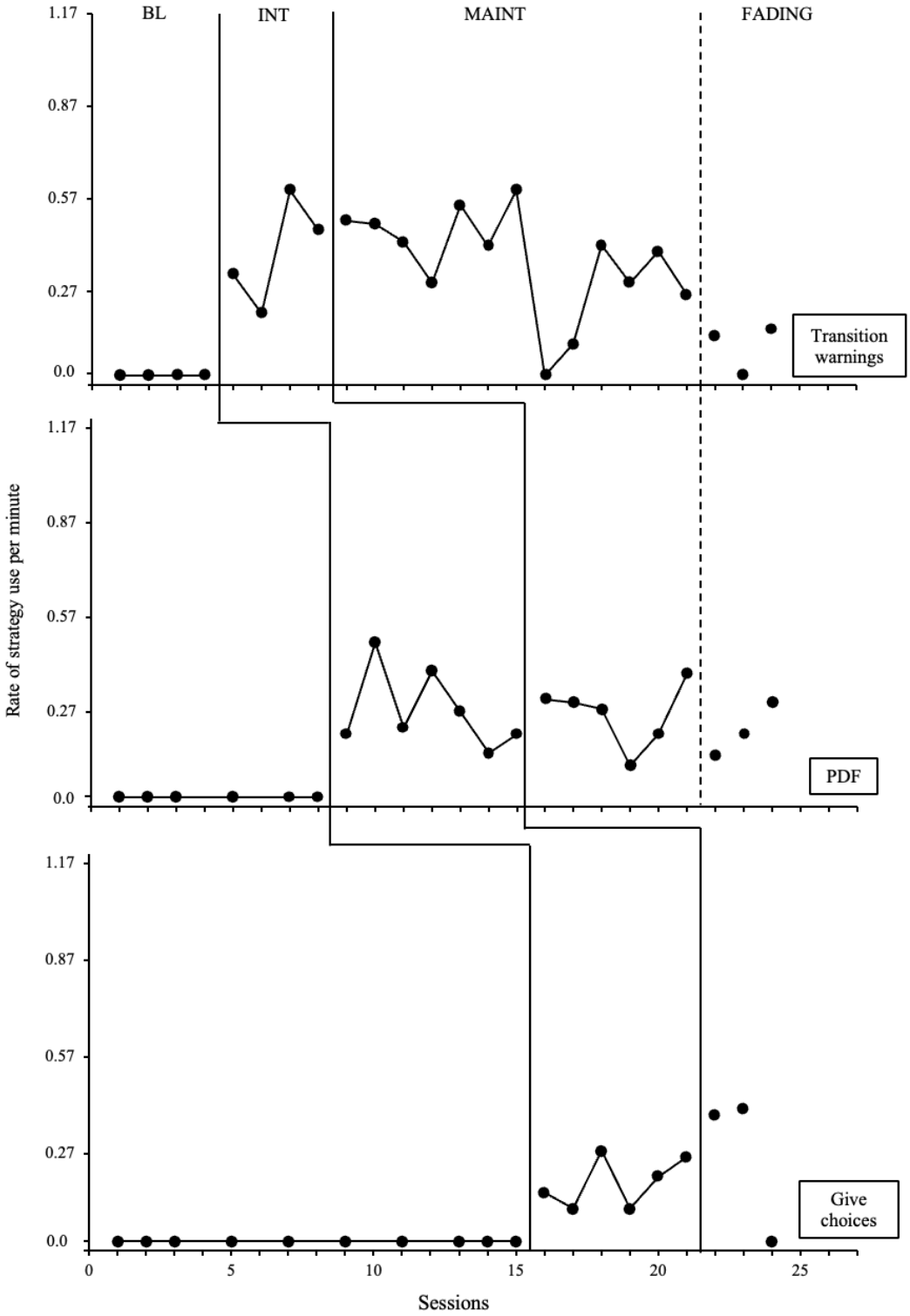


Figure 6

David's Use of Challenging Behaviors (Family 2)

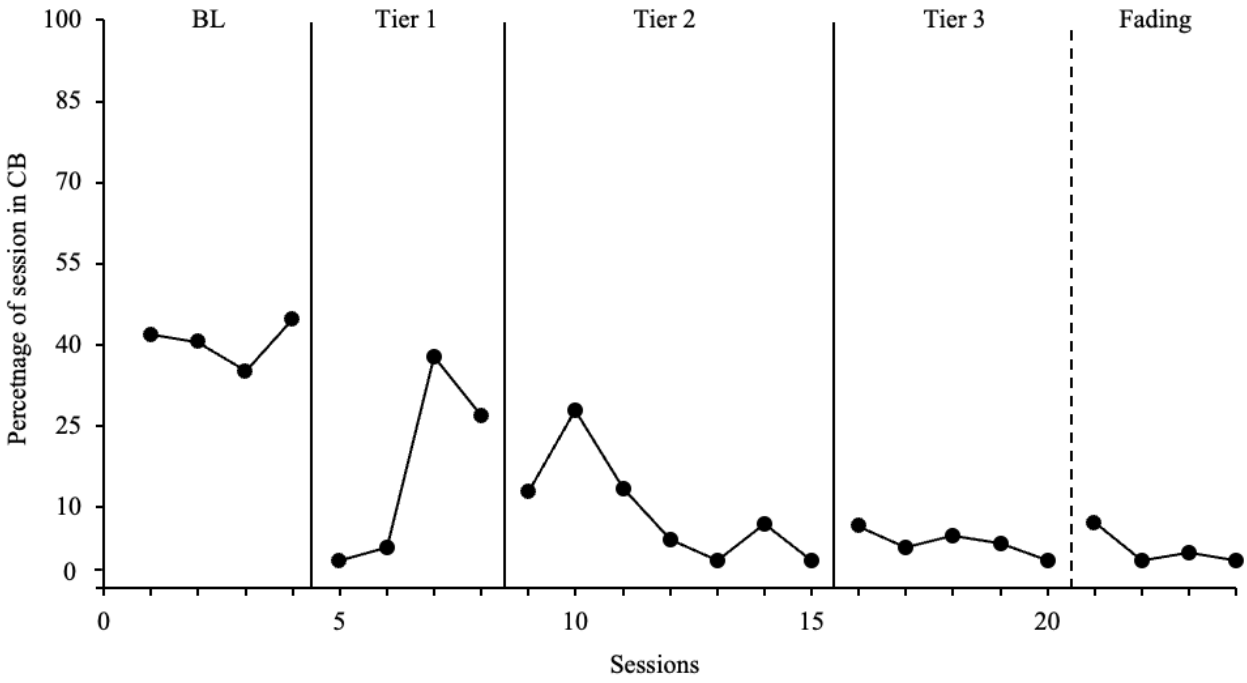


Figure 7

Mariela's Use of Target Intervention Strategies (Family 3)

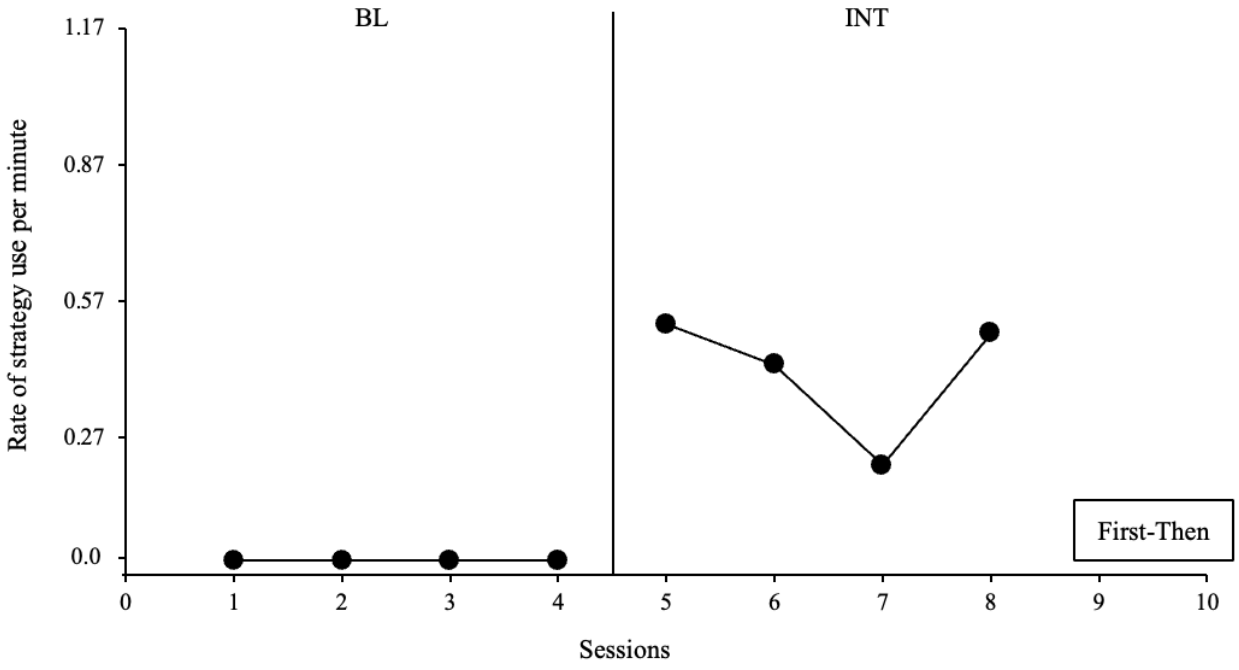
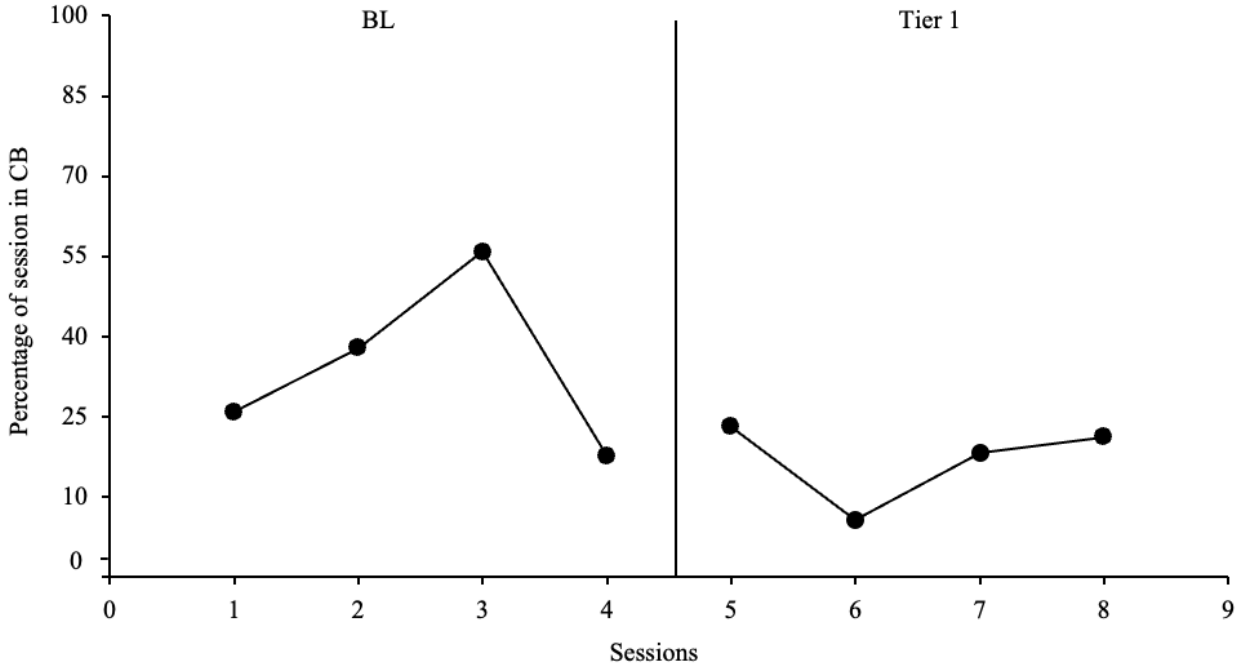


Figure 8

Ronaldo's Use of Challenging Behaviors (Family 3)



Appendix A

Letter of Support

Kommati

Río Guadalquivir #123
Col. Del Valle, 66250
SPGG, NL, México
anapaula@kommati.mx

Dear Dr. Erin Barton and Claire Winchester,

This letter is to express my support and willingness to collaborate in your research project evaluating the Family Behavior Support application with Spanish-Speaking caregivers and children. I understand that the purpose of this project is to identify and apply the necessary adaptations to ensure the efficacy and usability of the app with a culturally- and linguistically-diverse population, and to pilot test the adapted application with families of young children with challenging behaviors. I welcome the opportunity to assist in coordinating research activities at the Kommati Intervention Clinic, including focus groups, interviews, and single-case design procedures.

The study you are proposing presents an exciting opportunity for our families and our children and I look forward to collaborating with you on this project. I am excited for the opportunity to continue working with the both of you!

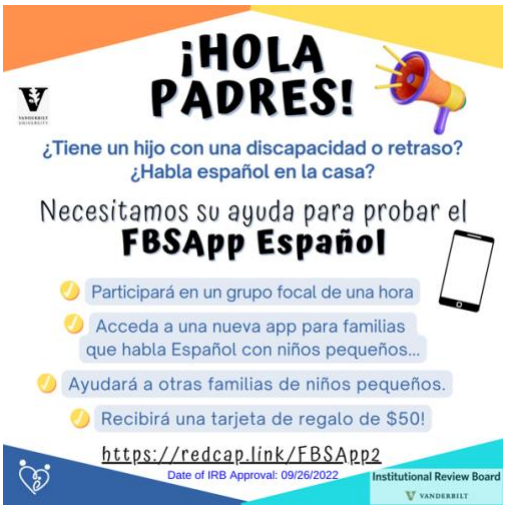
Sincerely,

_____

Ana Paula Martínez Cueto, M.Ed., BCBA
Kommati – Clinic Director
Associate Professor – Postgraduate Pediatrics Department, Tecnológico de Monterrey, Escuela de Medicina.
(+52) 811 822 9527
anapaula@kommati.mx

Appendix B

Recruitment Flyers



Appendix C

Semi-Structured Interview Protocol

Name:
Level of education:
Current occupation:
Describe what coaching methods, strategies, curricula, etc. you use in your work.

Describe your experience working with Spanish-speaking families of young children.
What adaptations do you make to your coaching practices for these families?
What adaptations do you make to materials / content?
Are there any other miscellaneous adaptations you make?

Before asking app questions:

1. Interviewer gives brief overview (5min) of app components and functionality.
2. Interviewee has 5-10min to access FBSApp Español

Interview questions (app):

1. Do the strategies feel appropriate for Spanish-speaking families of young children?
2. Would you choose not to use any of the strategies, or would you choose to teach any of the strategies differently?
3. Are there any strategies you would add?
4. Do the materials feel appropriate for Spanish-speaking families?
5. Are there any changes that you would recommend?

Before asking procedural questions:

1. Interviewer give brief overview (5min) of intervention procedures, examples of types of feedback, communication options.

Coaching procedures (app):

1. Would you use these procedures with Spanish-speaking families?
2. Is there anything you would change or do differently?

Exit questions:

1. Are there any other general recommendations that you have to maximize positive outcomes for the families we work with? For other families that might use the app?

Appendix D

REDCap Recruitment Form (Semi-Structured Interviews)

FBSApp Español - Early childhood professionals

Please answer the questions below to let us know if you qualify, and how we can contact you!

Thank you for your time!

Name:	_____
Which of these best describes your current role working with families of young children with disabilities?	◯ Early interventionist ◯ BCBA or clinical supervisor ◯ RBT ◯ Mental health professional ◯ Researcher ◯ Other
If other, please describe:	_____
How many years experience do you have working with Spanish-speaking families?	_____
What email address would you like for us to contact you at?	_____
Are you familiar with function-based interventions for challenging behavior?	◯ Yes, very! ◯ Yes, somewhat. ◯ I've heard the term before. ◯ Not at all.
Are you familiar with positive behavior interventions and supports (PBIS)?	◯ Yes, very! ◯ Yes, somewhat. ◯ I've heard the term before. ◯ Not at all.
Do you have an Apple mobile device (e.g., iPhone, iPad)?	◯ Yes ◯ No

Appendix E

REDCap Recruitment Form (Focus Groups)

FBSApp Español - Focus group families

Please answer the questions below to let us know if you qualify, and how we can contact you

¡Responda las siguientes preguntas para informarnos si califica y cómo podemos comunicarnos con usted!

Thank you for your time!

¡Gracias por su tiempo!

Name / Nombre:	_____
Mailing address / dirección postal:	_____
Do you have a child younger than 8 years of age with a disability or delay? ¿Tiene un hijo menor de 8 años con alguna discapacidad o retraso?	◯ Yes / Sí ◯ No
Do you speak Spanish (or a combination of Spanish and English) at home with your child? ¿Habla español (o una combinación de español e inglés) en casa con su hijo?	◯ Yes / Sí ◯ No
Do you have an Apple mobile device (iPhone or iPad)? Tiene un dispositivo móvil Apple (iPhone o iPad)?	◯ Yes / Sí ◯ No
How would you like for us to contact you? ¿Cómo le gustaría que lo contactemos?	◯ Email / Correo electrónico ◯ Phone call / Teléfono ◯ Text / Texto ◯ Whatsapp
Phone number / número de teléfono:	_____
Email address / correo electrónico:	_____

Appendix F

Focus Group Protocol

FOCUS GROUP INTRODUCTION

WELCOME & INTRODUCTIONS
Thanks for agreeing to be part of the focus group. We appreciate your willingness to participate.

PURPOSE OF FOCUS GROUPS
The reason we are having these focus groups is to get a family perspective on the usability, appropriateness, and appeal of the FBSApp Español. The app was originally developed for and has been tested with English-speaking families in the U.S., so before we test it with Spanish-speaking families, we want your input and feedback on it. We want you to share your honest and open thoughts with us. It's going to improve the work we do and the way we support families of young children with challenging behaviors.

GROUND RULES
1. WE WANT YOU TO DO THE TALKING.
    a. We would like everyone to participate.
    b. I may call on you if I haven't heard from you in a while.

2. THERE ARE NO RIGHT OR WRONG ANSWERS.
    a. Every person's experiences and opinions are important.
    b. Speak up whether you agree or disagree.
    c. We want to hear a wide range of opinions.

3. WHAT IS SAID IN THIS ROOM STAYS HERE.
    a. We want folks to feel comfortable sharing when sensitive issues come up.

4. WE WILL BE RECORDING THE GROUP.
    a. We want to capture everything you have to say.
    b. We don't identify anyone by name in our report. You will remain anonymous.

Opening questions (round robin):
1. Tell us a little about yourself and your family.
2. Tell us about your experience working with therapists or interventionists in the context of your child's behavior and development.

Before asking app questions:
1. Moderator gives brief overview (5min) of the app components and functionality.
2. Caregivers have 5-10min to access FBSApp Español.

Exploration questions (app):
1. What are your initial thoughts about the app?
2. Tell us about the content (universal strategies pages, infographics, videos) of the app?

    a. Is the content within the app appropriate for families of young children from diverse backgrounds?
3. Tell us about your overall impression of the app.
    a. How likely are you to use the app on your own?
    b. How likely are you to recommend it to someone else?
    c. How likely would you be to use the app with support from a therapist or coach?

Before asking coaching questions:

1. Moderator gives brief overview (5min) of the intervention procedures, examples of types of feedback, communication options.

Exploration questions (coaching):

1. What are your initial thoughts about the procedures?
2. How would you feel about receiving this kind of support to address your child's behaviors at home?
3. How feasible/accessible do the procedures feel?
    a. What would make them feel more feasible?
4. How appropriate do the procedures feel for Spanish-speaking families of young children with challenging behaviors?
    a. What would make them feel more appropriate?

Exit questions:

1. Is there anything else you would like to say about the app or procedures?

Appendix G

Synthesized Member Checking Surveys (Interviews and Focus Groups)

Thank you for taking the time to give us your feedback!

Please reach out to Claire at claire.r.winchester@vanderbilt.edu if you have any questions or thoughts.

---

1) Name: _____

THANK YOU for your participation in the FBSApp Español research project!

Now that we're coming to the end of our study and writing up our results, we want to confirm with our participants (you guys!) that our findings and interpretations align with their experiences. On the next page, we'll present our findings from both phases of data collection. Next, you'll have an opportunity to agree or disagree with our findings, or give additional feedback or clarification.

Please be as HONEST and DETAILED as you feel comfortable being - we want to represent everyone's experiences accurately! And again, thank you for your time and effort! We couldn't do this work without YOU!

Adaptations made for Spanish-speaking families:

1. Translating materials into Spanish
2. Adapting language to be culturally appropriate and family-friendly
3. Awareness of one's own cultural position and background
4. Consideration of the cultural importance of deference to authority
5. Instruction on U.S. customs, both explicit (e.g., laws) and implicit (e.g., cultural norms)
6. Emphasis on replacements for physical punishment
7. Involving the entire family unit
8. Addressing cultural lack of understanding / stigma around disability, particularly autism
9. Simplifying content
10. Logistic individualization for families (e.g., schedules, routines)
11. Personal individualization for families (e.g., values, preferences)
12. Providing additional resources according to family need

---

2) Do these adaptations align with your experiences? Is there anything you would add or take away from this list? Anything you would like to clarify? _____

Feedback on the FBSApp (from professionals and caregivers):

1. Positive feedback:

Strategy videos and infographics Convenience of a mobile app Usefulness when paired with support from a coach or therapist Importance of a resources families can access independently Culturally responsive and appropriate for Spanish-speaking families Availability for those without other access to resources 2. Suggestive feedback and recommended additions:

Infographics could be more readable and family-friendly Wording / phrasing sometimes not clear Difficulty navigating the app Developing an Android version More opportunities for individualization within the app Include resources around basic needs and developmentally-appropriate behaviors during early childhood years

3) Does this feedback align with your experiences? Is there anything you would add or change? Any clarification you would like to add?

_____

Feedback on the coaching procedures:
1. Positive feedback:

Individualization to each family Incorporating bi-directional feedback (i.e., from family to coach, and from coach to family) Multiple methods of communication Instruction on rationale behind strategies Importance of support in naturally-occuring settings 2. Suggestive feedback:

Considering the cultural importance of deference to authority in Latino/Hispanic families Awareness of Latino/Hispanic families' hesitancy around minimizing attention to challenging behaviors

4) Does this feedback align with your experiences? Is there anything you would add or take away? Any clarifications that you'd like to make?

_____

Recurring Themes Across All Phases:

1. Family individualization over cultural assumptions

"Just because they speak Spanish and they're Hispanic doesn't mean that they're going to be a specific way, because every Hispanic family has their own sub-culture. [Each family] has their own culture and they might do things differently...and it's not always going to be that every family follows a certain routine or values a specific thing, you know." 2. Necessity of flexible individualization to each family's unique needs

"But for example, when talking about a diagnosis, a lot of the time I try to gauge how much they know and then go from there. So meeting the family where they're at is always important." "What I would find as a better opportunity ... would be more space for customizing what kind of notes we need to put." 3. Importance of accessible language

"Even in English, right, we always have to think about how parents are understanding our words, and we don't use jargon. So I was always trying to do that in Spanish too. I was trying not to use too much jargon. It helped me to talk to other people about the words I was suing and to see if it came across [understandable]." 4. Importance of reassurance for families of young children with disabilities

"I just wanted to add that just listening to others has been very valuable to me. I learned the word "stimming" which is something that [our child] does, the repetitive movements. Sometimes it can be hard...so [hearing] the terminology helps us a lot, and just knowing that we are facing the same challenges in this group. Thank you so much." "With telling the parent, I think how you explain the diagnosis or how you're explaining it is really important to them. Letting them know it doesn't change their child but rather it just helps with...receiving the correct services." 5. Continued need for culturally appropriate services and supports for Spanish-speaking families

"I've never used a curriculum that is specifically made for Spanish-speaking Hispanic or Latino families. So it's always kind of been on the fly translation and interpreting." "Speaking a little more about our Spanish-speaking countries, I feel that in countries like Chile, Venezuela, Colombia, access to these therapies is much more expensive than in other countries, so it will be very good for families to have this type of application."

5) Do these themes align with your experiences? Is there anything you would add or take away? Any clarification you would like to add?

_____

6) Is there anything else you would like us to know?

_____

¡Gracias por tomarse el tiempo para darnos su opinión!

Comuníquese con Claire en claire.r.winchester@vanderbilt.edu si tiene alguna pregunta o comentario.

---

1) Nombre: _____

¡GRACIAS por su participación en el estudio de investigación de la FBSApp
Espan
˜
ol!

Al llegar al final del estudio, estamos empezando a escribir sobre nuestros hallazgos. Queremos confirmar con nuestros participantes (¡ustedes!) que los hallazgos y las interpretaciones de ellos se alinean con sus experiencias. En la próxima página presentaremos los hallazgos de ambas fases de recopilación de datos. A continuación, tendrán la oportunidad de estar de acuerdo o desacuerdo con nuestros hallazgos y brindar comentarios o aclaraciones adicionales.

Por favor, sea tan HONESTO y DETALLADO como se sienta cómodo - queremos representar las experiencias de todos tal como fueron y con precisión. Otra vez, ¡gracias por su tiempo y esfuerzo! ¡No podríamos hacer este trabajo sin USTEDES!

Comentarios sobre la FBSApp (de profesionales y cuidadores):

1. Comentarios positivos:

Videos de estrategias e infografías Conveniencia de una aplicación móvil Utilidad cuando se combina con el apoyo de un entrenador o terapeuta Importancia de un recurso al que familias pueden acceder de forma independiente Culturalmente receptivo y apropiado para familias de habla hispana Disponibilidad para quienes no tienen otro acceso a recursos 2. Comentarios y adiciones sugeridos:

Las infografías podrían ser más legibles y familiares La fraseología a veces no está clara Había dificultades en navegar la aplicación Se debería desarrollar una versión de Android Más oportunidades para individualización dentro de la aplicación Incluir recursos sobre necesidades básicas y comportamientos apropiados para el desarrollo durante los primeros años de infancia

---

2) ¿Se alinean estos comentarios con sus propias experiencias? ¿Hay algo que agregaría o cambiaría? ¿Alguna aclaración que quiera añadir? _____

Comentarios sobre los procedimientos de entrenadores familiares:

1. Comentarios positivos:

Individualización a cada familia La incorporación de comentarios bidireccional (i.e., de la familia al entrenador y del entrenador a la familia) Varios métodos de comunicación Instrucción sobre la razón de ser de las estrategias La importancia de apoyo en escenarios naturales 2. Comentarios y adiciones sugeridos:

Considerar la importancia cultural de la deferencia a la autoridad en las familias latinas/hispanas Conciencia de la vacilación de las familias latinas/hispanas en cuanto a minimizar la atención a los comportamientos desafiantes

---

3) ¿Se alinean estos comentarios con sus propias experiencias? ¿Hay algo que agregaría o cambiaría? ¿Alguna aclaración que quiera añadir? _____

Temas recurrentes en todas las fases:

1. Individualización familiar sobre supuestos culturales.

"El hecho de que hablen español y sean hispanos no significa que vayan a ser de una manera específica, porque cada familia hispana tiene su propia subcultura. [Cada familia] tiene su propia cultura y pueden hacer cosas diferente... y no siempre será que cada familia siga una cierta rutina o valore algo específico, sabes". 2. La necesidad de individualización flexible a las necesidades únicas de cada familia.

"Pero, por ejemplo, cuando se habla de un diagnóstico, muchas veces trato de evaluar cuánto saben y luego partir de ahí. Por lo tanto, conocer a la familia donde están siempre es importante". "Lo que encontraría como una mejor oportunidad... sería más espacio para personalizar qué tipo de notas necesitamos poner". 3. La importancia del lenguaje accesible.

"Incluso en inglés, claro, siempre tenemos que pensar en cómo los padres entienden nuestras palabras y no usamos jerga. Así que siempre intentaba hacer eso también en español. Intentaba no usar demasiada jerga. Me ayudaba a hablar con otras personas sobre las palabras que estaba usando y ver si se entendían. 4. La importancia de la tranquilidad para las familias de niños pequeños con discapacidades.

"Solo quería agregar que escuchar a los demás ha sido muy valioso para mí. Aprendí la palabra "stimming", que es algo que [nuestro hijo] hace, los movimientos repetitivos. A veces puede ser difícil... así que [escuchar] la terminología nos ayuda mucho, y el solo hecho de saber que enfrentamos los mismos desafíos en este grupo. Muchas gracias". "Al decirle a los padres, creo que la forma en que explicas el diagnóstico o cómo lo explicas es realmente importante para ellos. Hacerles saber que no cambia a su hijo, sino que simplemente ayuda a... recibir los servicios correctos. " 5. Hay la necesidad continua de servicios y apoyos culturalmente apropiados para familias de habla hispana.

"Nunca he usado un currículo diseñado específicamente para familias hispanas o latinas de habla hispana. Por lo tanto, siempre ha sido traducción e interpretación sobre la marcha." "Hablando un poco más de nuestros países de habla hispana, siento que en países como Chile, Venezuela, Colombia, el acceso a estas terapias es mucho más caro que en otros países, entonces será muy bueno que las familias tengan este tipo de aplicación."

4) ¿Se alinean estos temas con sus propias experiencias? ¿Hay algo que agregaría o cambiaría? ¿Alguna aclaración que quiera añadir? _____

5) ¿Hay algo más que le gustaría que sepamos?

_____

Appendix H

REDCap Recruitment Form (Single-Case Study)

FBSApp Español - Pilot Study Families

Please answer the questions below to let us know if you qualify, and how we can contact you

¡Responda las siguientes preguntas para informarnos si califica y cómo podemos comunicarnos con usted!

Thank you for your time!

¡Gracias por su tiempo!

Name / nombre:	_____
Child's name / nombre del niño:	_____
Child's birthdate / fecha de nacimiento del niño:	_____
Does your child have a diagnosed disability or delay? ¿Su hijo tiene una discapacidad o retraso?	◯ Yes / Sí ◯ No ◯ I'm not sure / No sé
Does your child have challenging behaviors at home on a regular basis (at least several times per week)? ¿Su hijo tiene comportamientos desafiantes en casa regularmente (al menos varias veces por semana)?	◯ Yes / Sí ◯ No
Do you speak Spanish (or a combination of Spanish and English) at home with your child? ¿Habla español (o una combinación de español e inglés) en casa con su hijo?	◯ Yes / Sí ◯ No
How would you like for us to contact you? ¿Cómo le gustaría que lo contactemos?	◯ Email / Correo electrónico ◯ Phone call / Teléfono ◯ Text / Texto ◯ WhatsApp
Phone number / número de teléfono:	_____
Email address / correo electrónico:	_____

Appendix I

Single-Case Intake Protocol

Intake Procedures

Parent name: _____ Screening Date: _____ Therapist: _____

Criteria	Additional information	Meets criterion (yes/no/NA)
1. What is the child's current age?	Birth date: _____ Chronological Age: _____	Yes No
2. Does your child have a documented disability or delay? If so, what is their diagnosis or eligibility category?	Diagnosis and/or eligibility category: _____	Yes No

Child name: _____ Family's location : _____

3. Can you describe your child's challenging behaviors?

- What form do they take? Hurting self, tantrums, refusing to follow directions, hitting/kicking/biting, throwing things, screaming/crying, elopement
- How often do they happen? A few times a week, daily, multiple times a day?
- For how long do they last? A minute or two, 10-15 minutes, 30+ minutes?
- How important is it to you that your child follows your directions the first time they're asked? Does it feel appropriate or acceptable to you for your child to ask not to do something you've asked?

4. For this study, we're going to focus on a particular home routine that is the most difficult for your family, or that you feel like you would most prefer to get support with.

- Are there any particular routines where challenging behaviors are more likely? Getting ready for bed, meal time, bath time, getting up in the morning, playing with sibling, transitioning away from iPad/TV time
- Are there any of these routines that are difficult that are particularly important to you and your family?
- Are you comfortable video recording this routine so that we can observe, collect data, and give feedback?

5. This is a research study, so we're going to be following a specific protocol for how we support your family. Some things are set in stone and some things are flexible. We'll need to conduct 10min video observations of your family during the target routine 3-4 times per week throughout the duration of the study, which we anticipate being 8-16 weeks. We can provide a tablet to access the FBSApp and to record/submit videos, if that's something that would be helpful. For the first 2-3 weeks, you'll conduct the routine like you normally would, so we can get an idea of what this routine looks like for you and get to know you and your child a little better. You'll also

get access to the app and we'll start meeting with you to help you use it and to apply the strategies during the routine to support your child. You'll continue recording and submitting videos and we'll give you feedback on your use of the strategies based on the videos you submit. You'll help us pick the strategies we target, and we'll provide suggestions for how and when to use those strategies.

- These are the options for coaching and feedback. We'll meet via Zoom three or four times throughout the study to talk about each target strategy. Between these strategy meetings, you can receive feedback from your coach via email, text, phone call, or Zoom. Which feels most appropriate for you and your family's schedule? What would you prefer?
- You can also receive feedback after every observation you submit, after every other observation, or at the end of every week. Do you have a preference on how often you receive feedback?
- We'll also occasionally need to communicate between sessions to check in, see how things are going, and schedule future sessions. We can do this by email, text, WhatsApp, or phone call. What would you prefer?
- We can also include any family members or caregivers that also live in the home with you and your child. Is there anyone else you'd like to include in coaching?

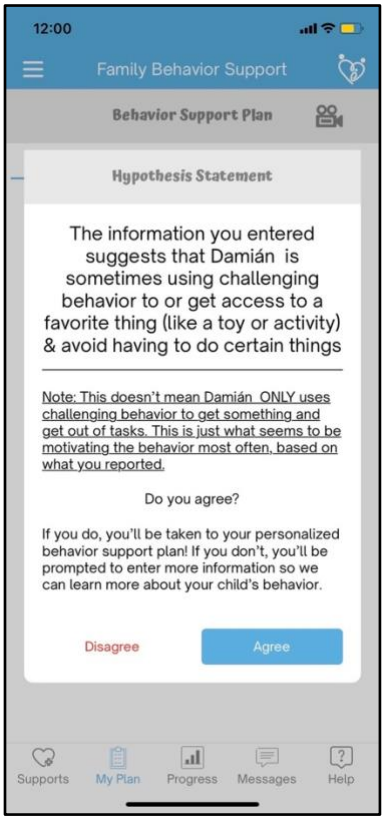
This is a research study so it won't necessarily be the most convenient or comfortable, but we will do everything we can to ensure you feel more confident and less stressed at the end of the study than you do now. You'll also be able to give us feedback throughout the study on how you feel about the procedures, and if you need to at any point you can always withdraw from the study with no penalty. We won't use your videos for anything other than data collection and we will do everything we can to protect the privacy of your data during and after the study. Finally, you'll also be compensated $300 US for your contribution to this study.

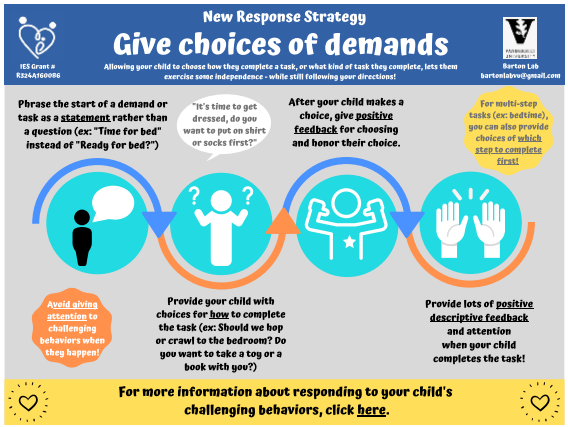
- What services do you and your child currently receive? What services or supports have you had in the past? What future supports do you have lined up or do you foresee having access to in the next 2-3 months?
- How comfortable do you feel recording and submitting videos for study purposes? How frequently (1x, 2x, 3x/week) do you foresee being able to record and submit videos? a

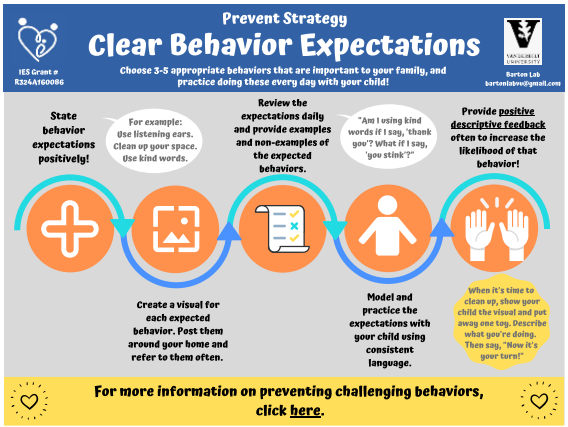
Before you can participate, you'll need to sign this form that we'll send to you via email. If you have any questions at all about the form, please ask.

Appendix J

Screenshots of FBSApp Content / Materials







Appendix K

Coding Manual

Evaluating the FBSApp with Spanish-speaking Families

Dependent Variable Procedures and Definitions
January – June 2023

Purpose: To estimate the occurrence and non-occurrence of behaviors of interest during a particular context or activity

Child behaviors of interest	**Challenging behaviors**	**Replacement behaviors**
	Physical aggression (toward others, toward self, toward objects), verbal aggression, noncompliance	Appropriate communication, following directions, appropriate play
Parent behaviors of interest	**Use of targeted intervention strategies**	
	Universal strategies: Positive descriptive feedback, First-Then, behavior expectations, redirection, visual schedule Prevent strategies: Transition warnings, giving choices, positive attention, playing with your child Teach strategies: Ask for attention, ask for help, ask for to be done, ask for something, follow directions, New response strategies: Prompt follow through, verbal reminders, choices of demands, minimize attention, delay access	
Context or activity	**Target routine identified by family**	
	Bedtime, bath time, dinner time, morning routine, transitions between activities, play with siblings, leaving a preferred activity	

Primary dependent variable: parent use of targeted intervention strategies
Secondary dependent variable: child behaviors

Estimation method

Child challenging behavior: interval sampling (5s)
Child replacement behavior: event recording
Parent use of target intervention strategies: event recording

General Coding Rules

- Start coding at the start of the recorded video (time stamp 00:00)
- Stop recording at the end of the recorded video OR after the maximum time has elapsed (time stamp 10:00)
- Mark any important information or questions in the Comments column as you code
- Each row represents a new time stamp – so if two behaviors happen at the same second, they will be marked in the same row. If one behavior happens at 01:15 and the next happens at 01:16, they will be marked on different rows.

Child Challenging Behavior (CB) Coding Rules

1. Download the assigned video and the coding template
2. Re-name the coding template so that it matches the video number + your initials + the date
   - For example: 013_CG_Jan04, 259_AH_Feb16
3. Code each 5s interval for challenging behavior
   - Pause the video at the end of the interval
   - Mark 0 if the child **is not** engaging in CB during the last second of the interval
     - For example: 00:03-00:04 of the first interval, 00:09-00:10 of the second interval
   - Mark 1 if the child **is** engaging in CB during the last second of the interval (even if it is only *part* of the last second)
     - Then select the type of CB that is occurring from the drop-down menu
   - Mark UNC if the child is out of the frame for the entire last second of the interval
     - Unless the child has left the area without permission (elopement) – then mark 1 for CB
4. Save the spreadsheet file to your folder on the Google Drive and delete the video from your computer
5. Mark the video as coded on the spreadsheet and email Claire with any questions!

Tips:

- **Try to ignore** all but the last second of the interval. Make a decision based on what happens in that last second, not what happened beforehand!
- You can watch ahead into the next interval to help make a decision about a behavior. For example, if the child starts to swing their arm in the direction of the parent at the very end of the interval, you can continue watching to see if they are attempting to hit the parent OR if they are doing something else.
- An attempt at CB will still be recorded as CB. For example, if the child attempts to hit their sibling but the parent blocks it, this behavior should still be recorded as CB.
- When in doubt, double check the definitions. Does the behavior match the definition? If someone else was watching this video and following the definitions, would they mark it as CB?

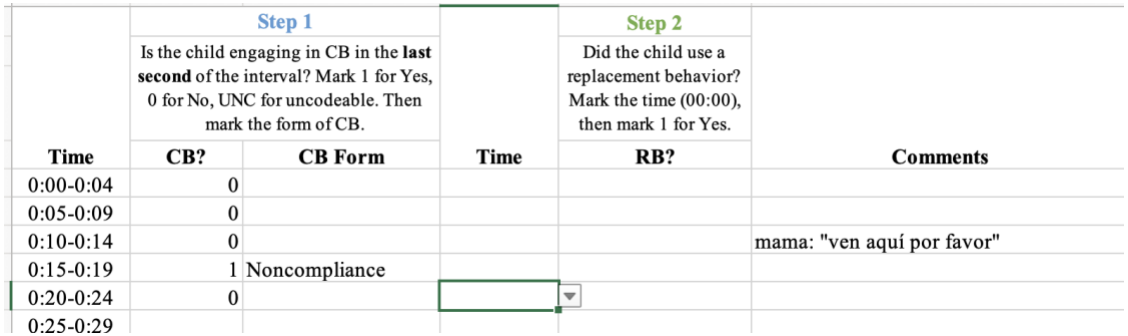
CB Definitions

Behavior	Definition	Examples	Non-examples
Physical aggression toward others, objects, or self Hitting, kicking, pushing or biting others or self; throwing objects; destroying objects	Any ***forceful*** physical contact or *attempts at contact* between (a) the child's body or object the child is holding, and (b) the child's body, another person's body, or object that is <u>not</u> contextually appropriate	Child throws a toy in their sibling's direction, but sibling moves and the toy does not make contact. Child slams a toy on the table repeatedly while crying. Child repeatedly hits their head against the floor when they are told to clean up.	Child kicks ball in the direction of the sibling while playing together outside. Child smacks their hands on a toy drum. Child claps their hands together forcefully and laughs when their parent tickles them.
Verbal aggression Screaming, yelling, threats, insults, cursing, tantrums, crying	The child produces a ***disruptive***, audible noise that may include intelligible words and/or sounds to communicate ***protest*** or ***negative feelings***	Child screams at their sibling when they refuse to share a toy. Child says, "Go away!" when their parent asks them to clean up. Child flops on the ground and cries when their parent tells them no.	Child screams excitedly when their parent comes in the room. Child calls out to their sibling in the other room to ask if they want to play. Child cries when they trip and fall.
Elopement	The child leaves the area *without permission* when expected to remain in the area, **or** moves in the *opposite direction* of compliance when given instructions	Child gets up and leaves dinner table during meal time. Child runs out of the room when their parent tells them to clean up their toys. Child leaves the room and stays out of the room after their parent asks them to come back.	Child gets out of their seat at the dinner table to pick up the spoon they dropped. Child runs to the bathroom after telling their parent they need to go potty. Child says, "I'm getting my book!" to their parent before walking into their bedroom.

Noncompliance	Any ***verbal refusal*** (e.g., "No!") to comply with an adult directive **OR** *lack of physical compliance* within 10s after the end of the directive	Child shakes their head and sits down when their parent asks them to put on their shoes. Child continues playing when their parent asks them to put their toys away. Child says, "No!" when their parent says, "It's time to get ready for bed."	Child shakes their head but begins putting shoes on when their parent asks them to. Child says, "Can I finish this first?" and parent agrees. Child says, "Help please" and holds out their shoes when their parent asks them to. Child doesn't respond when parent says, "Are you ready to go to bed?"

Noncompliance Notes:

- A directive may include a question (e.g., "Can you pick this up?") but should still include a clear directive. For example, "Are you ready to…?" or, "Should we…?" is not considered a directive.
- Record the parent's directive in the Comments column in the row with the corresponding interval. Begin CB the interval AFTER the parent's directive has completed. For example, parent says "Come here", which ends at 5:07. Interval ending with 5:10 would be 0, interval with 5:15 would be 1 if child has not completed the action.
- Repeat this process if the parent repeats their direction or gives a new one.



	Step 1			Step 2	
	Is the child engaging in CB in the **last second** of the interval? Mark 1 for Yes, 0 for No, UNC for uncodeable. Then mark the form of CB.			Did the child use a replacement behavior? Mark the time (00:00), then mark 1 for Yes.	
Time	**CB?**	**CB Form**	**Time**	**RB?**	**Comments**
0:00-0:04	0				
0:05-0:09	0				
0:10-0:14	0				mama: "ven aquí por favor"
0:15-0:19	1	Noncompliance			
0:20-0:24	0				
0:25-0:29					

Parent Strategy Coding Rules

1. Download the assigned video and the coding template
2. Re-name the coding template so that it matches the video number + your initials + the date
   - For example: 013_CG_Jan04, 259_AH_Feb16
3. Code the video for the parent's use of the target intervention strategy
   - Pause the video when you notice the parent using a strategy
   - Mark the time that the parent **begins** using the strategy
     - For example: mark the second that the parent started speaking to give a transition warning
   - Select the type of strategy that the parent used from the drop-down menu
   - Note: There must be 3s between the end of one strategy and the beginning of another one to count as a new strategy. *This rule only applies when the parent uses **the same strategy** twice in a row!*
     - For example, if the parent says, "Great job!" and holds up their hand for a high five 1s later, this will count as **one** strategy. If the parent says, "Great job!" and holds up their hand for a high five 4s later, this will count as **two** strategies.
4. Save the spreadsheet file to your folder on the Google Drive and delete the video from your computer
5. Mark the video as coded on the spreadsheet and email Claire with any questions!

Universal Strategy Definitions

Strategy	Definition	Example	Non-Example
Positive descriptive feedback	Any communication from the caregiver to the child indicating positive feedback for a specific behavior the child demonstrated. Must include **both**: 1. Positive language (good job, way to go, thank you, high five, great, awesome) 2. Description of the child's behavior (following directions, cleaning up your toys, listening, sitting down)	"Thanks for putting away toys!" "You cleaned up!" + a high five "You are so smart, you fixed the puzzle! "I'm proud of you for listening to directions."	"Great job!" "I am proud of you." "Thanks!"
Visual schedule	Verbal or gestural behavior in reference to a visual representation of scheduled activities 1. Must include the VISUAL component	Child says, "What's next?" and caregiver points to the schedule "We are going to the park, then eating lunch," while pointing at a schedule.	Verbal reference to the day's schedule without a visual Caregiver says, "If you don't follow directions, we won't go to the park."
First/Then	Caregiver provides a verbal or visual cue of, "First ___, then ___" regarding upcoming activities. Must include: 1. The word "first" **or** "then," 2. First activity is a task or demand and second activity is a preferred activity or reinforcer	"First bath, then a song" "We're going to eat dinner, then you can have ice cream." "First work! After that, toys."	"First bath, then brush teeth." "First clean up."
Behavior expectations	Caregiver prepares the child for success by vocally stating goals for behavior or general ways the parent would like the child to act, given the context. Must **NOT** be: 1. Negatively stated – the child is told what they CAN DO 2. Something the child is expected to do in that moment (i.e., a direction) 3. In reaction to a child's behavior	"You need to sit at the table to eat dinner." "We're going to keep our bodies safe at the park." "You can ask for help if you need something."	"Don't climb on the table." "Go wash your hands." "Sit, please," after child stands up. "Can you come here please?"

Prevent Strategy Definitions

Strategy	Definition	Examples	Non-examples
Choices	Caregiver presents child with two or more possibilities of items, activities, people, food, etc. Must **NOT** be: 1. Punitive in nature 2. In response to CB	"Do you want a sandwich or noodles?" "Time to get dressed! Shirt or pants first?" "Do you want mom or dad to tuck you in?"	"Do you want to clean up or go to time out?" Caregiver says, "Do you want oranges?" Child says, "No." Caregiver says, "Do you want apples?"
Transition warnings	Caregiver prepares the child for an upcoming change (ending or beginning of an activity) by providing a verbal or gestural cue. Must include: 1. A description of the duration (e.g., 1 more minute) or amount (e.g., 1 more turn) before the change	"After one more push, we're all done swinging." Child asks, "How many more minutes?" and the caregiver points to a visual timer. "5 more minutes before bedtime."	"Time to go to bed!" Caregiver sets a timer and puts it next to the child without saying anything.
Positive attention	Caregiver engages verbally or gesturally with the child in a positive way. Must **NOT** be: 1. A direction or instruction 2. A question	Caregiver gives the child a hug, high five, thumbs up, pat on the back, etc. "I'm excited to see you today!" "That's a great idea." "You won the game!"	"What did you eat for lunch?" Caregiver doesn't respond when the child asks a question. Caregiver tells the child's sibling to give them a high five.

Teach Strategy Definitions

Strategy	Definition	Examples	Non-Examples
Ask for attention	Caregiver verbally or gesturally prompts child to ask for attention (e.g., help, a hug, play, come here) Must include a clear indication of what the child can do to get attention.	"Do you want a hug?" Child nods. "You can say, 'Hug please.'" "I'm going over here to do some work. If you need me, you can ask for help." "Remember you can ask for me to play with you if you want."	"Do you want a hug?" Child nods. Caregiver gives a hug. "I'm going over here to do some work." "What do you want?"
Ask to be done	Caregiver verbally or gesturally prompts child to ask to be "all done" or to not do something. Must include a clear indication of what the child can do to get out of the task.	Caregiver models the sign for 'all done.' "If you don't want to, you can tell me." "If you need a break, you can say, 'Break please.'"	"Do you need something?" Child starts to cry. Caregiver says, "You can be all done." Child says, "All done," independently without prompting from caregiver.
Ask for an object	Caregiver verbally or gesturally prompts child to ask for a specific object (e.g., toy, food) or activity (e.g., watch iPad, play Legos). Must include a clear indication of what the child can do to access the object.	"If you want your iPad you can say, 'iPad please.'" "You can say, 'More,' if you need more juice." "Do you want a different toy?" Child nods. "You can ask for it."	"Do you want your iPad?" "If you want your iPad, it's right over here." Child reaches for their cup and starts to whimper. Caregiver gives the child the cup.
Ask for help	Caregiver verbally or gesturally prompts child to ask for help. Must include a clear indication of what the child can do to get help.	"Do you need help? You can say, 'help, please.'" Caregiver models the sign for "help" "If you need help you can ask for it."	"Do you need help?" "I can help you." "I'm cooking dinner so you have to do this by yourself."

New Response Strategy Definitions

***Note:** New Response strategies can only be coded AFTER or DURING challenging behaviors!*

Strategy	Definition	Examples	Non-Examples
Choices of demands	Caregiver presents child with two or more possibilities for how to complete a task or directive. Must be: Related to the task the caregiver has presented **NOT** punitive in nature	"It's time to get ready for bed." Child refuses. "Do you want to brush your teeth or put on pajamas first?" "Time to go to the car!" Child refuses. "Do you want to hop like a frog or stomp like a dinosaur?"	"It's time to get ready for bed." Child refuses. "Do you want to get ready for bed or go to time out?" "Time to go to the car!" Child refuses. "Do you want to play with Legos or iPad when we get home?"
Prompt follow-through	Provides prompting (verbal, gestural, or physical) to help child complete a task or directive by: 1. Providing new information 2. Providing help (physical, verbal, or gestural) 3. Changing the demand Does **NOT** include repeating the same directive, or threats of punishment.	"Come to the table." Child refuses. "Come to the table so we can eat dinner. And ice cream for dessert!" "Turn off the iPad." Child ignores. Caregiver points to power button. "Two more bites!" Child refuses. "How about one more bite?" "Wash your hands." Child refuses. Caregiver physically moves child's hands under running water.	"Time for bed." Child refuses. "Time for bed." "Two more bites!" Child refuses. "Two more bites or no dessert." "Turn off the iPad." Child ignores. "Turn off the iPad, please."
Delay access	Caregiver purposefully denies the child access to a preferred object or activity until the child asks for it.	Caregiver holds iPad out of reach while modeling, "iPad please," until child repeats. Caregiver takes the toy away from the child and sets it on the table when they start tantrumming.	Caregiver hands child the iPad after they've stopped crying.

Minimize attention	Caregiver provides minimal attention to the child without referencing the child's challenging behaviors. Attention **must** be limited to maintaining safety or brief verbal statements.	Caregiver says, "I can help when your body is calm," and turns their head away while child is throwing a tantrum. Caregiver moves toys away from the child (without speaking) when child starts crying and throwing toys. Caregiver says, "Do you need a break?" when child starts screaming, and then walks to the other side of the room when the child doesn't respond.	Caregiver redirects the child repeatedly to sit down when they're having a tantrum. Caregiver says, "Do you need a break? You seem sad. Can I give you a hug?" when child starts screaming.
Verbal reminders	Caregiver gives a brief, verbal reminder of the appropriate behavior the child can engage in. Must be: 1. Positively stated 2. Not paired with negative attention or punishment	"Eat some peas." Child cries. "If you don't want to eat your peas, you can say, 'No thank you.'" "Put your shoes on." Child refuses. "You can put your shoes on, then we can go outside."	"Eat some peas." Child cries. "If you don't eat your peas, you're going to time out." "Put your shoes on." Child refuses. Caregiver puts their shoes on for them.

Child Replacement Behavior (RB) Coding Rules

- Mark the time that the child BEGAN using a RB in the time column (00:00)
- Mark 1 in the RB column
- Describe the type of RB in the Comments (for example, type what the child said if they asked for something)
- There must be 3s between the end of one RB and the beginning of another one to count as a new behavior
    - For example, if the child says, "Help," and uses the sign for help at the same time, this will count as **one** behavior. If the child says, "Help," and uses the sign for help 3s later, this will count as **two** behaviors.

Replacement Behavior definitions

Strategy	Definition	Examples	Non-Examples
Ask to be done	Child verbally or gesturally communications a request to be "all done" with the current task or demand. Can be prompted or unprompted (spontaneous).	Child signs "all done" Child asks, "All done please?"	Any verbal or gestural communication of "all done" that co-occurs with CB

Appendix L

Example Introductory Meeting Slides

Apoyo al Comportamiento Familiar: FBSApp

Introducción a la FBSApp

Agenda

1. Introducción breve
2. Instalación de la FBSApp
3. Creando el perfi[redacted]brina
4. Siguientes pasos & planificación

Introducción

¿Cómo me apoyará mi entrenador a lo largo del estudio?

- Capacitación en cada estrategia nueva (tres total)
- Retroalimentación en el uso de la estrategia en la rutina específica
  - Correos electrónicos semanales
- Disponibilidad para contestar cualquier pregunta (sobre estrategias, FBSApp, etc.)

Introducción

¿Cómo me apoyará mi entrenador a lo largo del estudio?

- Programando capacitaciones y grabaciones de video semana a semana
- Programación/retroalimentación basada en los datos de videos
- Resolución de problemas con la aplicación, rutinas y estrategias

Instalación del App

Instalar App
Crear cuenta
Iniciar sesión
Video de introducción
Agregar profesionales

Información de padres

Ingresa tu información personal

*¡Asegúrate de guardar tu mail y contraseña!

Información del niño

Ingresar información básico [redacted]brina

Comunicación del niño

Ingresa información de cómo se comunica tu hijo

- Todos los niños comunican sus necesidades de manera distinta
- Los comportamientos desafiantes también son una forma de comunicación

Preferencias del niño

¿Cuáles son algunas de las cosas favoritas de tu hijo?

Agregar un cuidador / profesional

Agregar otro cuidador para descargar el FBSApp y poder ver la cuenta de [redacted]abrina

Agregar a Claire para ver y tener acceso a la cuenta de Sabrina

claire.r.winchester@vanderbilt.edu

Página de soporte universal

Página de "Inicio"

Cada círculo representa una estrategia (o grupo de estrategias) que benefician a <u>todos</u>

Página de soporte universal

- Video sobre la recopilación de datos ABC al final de cada página de estrategias
- Saltar la pregunta de comportamiento desafiante - después regresaremos a ella
- Una estrategia nueva se abre cada día que ingresas al App

¿Preguntas?

Siguientes pasos

1. Grabar y subir tres videos diferentes de 10 minutos de la rutina específica

Tips:

- Empieza a grabar 1 minuto antes de que empiece la rutina, y deja de grabar después de que hayan pasado 10 minutos
- Si es posible, coloca el celular/tablet a un lado de la habitación, en algún lugar donde Sabrina no se distraiga mucho. Intenta colocarlo donde Sabrina esté en el marco la mayoría del tiempo posible (aunque está bien si no sale en el video el 100% del tiempo)
- ¡Haz la rutina como la harías normalmente!

1. Regresar a la aplicación una vez al día para acceder a una estrategia universal nueva
2. Complete el cuestionario previo al studio
   - https://redcap.link/family-pre

Appendix M

Example Antecedent-Behavior-Consequence (ABC) Meeting Slides

Apoyo al Comportamiento Familiar: FBSApp

Recopilación de datos ABC

Agenda

1. Supervisando
2. Revisar los videos previos de la línea de base
3. Recopilación de datos ABC
4. Siguientes pasos & planeación

Supervisando

¿Cómo les ha ido con la rutina? ¿Cómo van con la grabación de videos?

¿Han entrado al App desde la última junta?

Recopilación de datos ABC

Antecedents
(Antecedentes):
- ***Detonan*** el comportamiento desafiante

Behavior
(Comportamiento)

Consequences
(Consecuencias):
- ***Detienen*** el comportamiento desafiante

Recopilación de datos ABC

Recopilación de datos ABC → Función

La recopilación de datos ABC nos ayudará a identificar la **función** (o propósito) del comportamiento desafiante de su hijo

Función del comportamiento desafiante = Ganar o escapar de algo

Identificar la función del comportamiento desafiante de [redacted] nos ayudará a identificar las estrategias que tienen más probabilidades de prevenirlo o reducirlo en gran medida.

Recopilación de datos ABC → Función

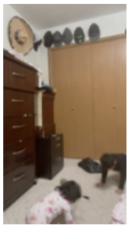
- Por ejemplo, si su hijo a menudo se involucra en CB cuando se le pide que haga algo, la función de su comportamiento podría ser escapar de las tareas.
- Si los antecedentes en torno al comportamiento de su hijo son diferentes, pero siempre da como resultado el acceso a su iPad, la función de su comportamiento podría ser obtener acceso al iPad.
- ¡Según la función, podemos implementar estrategias específicas para prevenir y abordar el comportamiento de su hijo!

Antecedentes y Consecuencias

- En la App, clasificamos antecedentes y consecuencias en cosas que están relacionadas con objetos / actividades, instrucciones o personas

Recopilación de datos ABC

¡Esté atento a los ABC!



Antecedentes

De la lista, ¿qué cree que *detonó* el comportamiento desafiante de su hijo?

Consecuencias

De la lista, ¿qué cree que *detuvo* el comportamiento desafiante de su hijo?

Recopilación de datos ABC - Instancia I

¡Ahora, ingresemos a la primera instancia de datos ABC en la aplicación!

1. Página de soportes universales
2. Haga clic en la estrategia de amor propio
3. "¿Tu hijo se involucró en un comportamiento desafiante hoy?" - Sí

Recopilación de datos ABC - Instancia 1

4. Seleccionar antecedentes

5. Seleccionar comportamiento

6. Seleccionar consecuencia(s)

7. Seleccionar actividad

Siguientes pasos

1. Durante la siguiente semana:
   - Inicie sesión en la aplicación una vez al día para acceder a una nueva estrategia universal e ingresar datos
   - ¡Revise y reflexione sobre cada estrategia a medida que avanza!
   - Ingrese 2-3 instancias más del comportamiento desafiante (idealmente una por día)

Cuando termine de recopilar datos...

Después de poner 3 puntos más de datos, observará una hipótesis

Si la respuesta es si → su Plan de apoyo del Comportamiento será generado

Si la respuesta es no → le pedirá recopilar más datos

Si tiene preguntas sobre su hipótesis, pregúntele a su entrenador

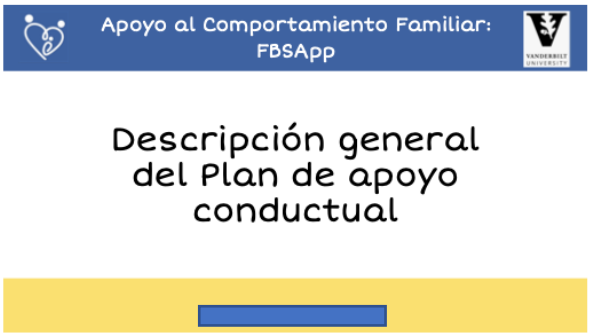
Siguientes pasos

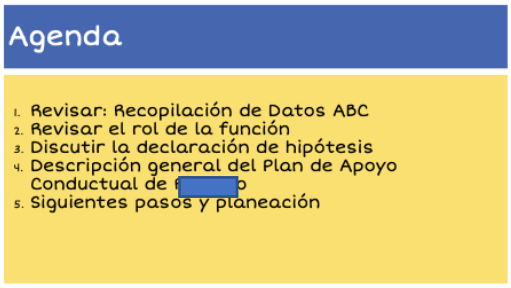
1. Durante la siguiente semana:
   - Registre 3-4 instancias más de comportamiento desafiante de forma independiente
   - Responda a su hipótesis
   - Registre 2-3 videos más para rutina
2. Después de ingresar los datos, vamos:
   - Revisar la recopilación de datos ABC
   - Agendar la siguiente reunión donde repasamos el Plan de soporte de Comportamiento

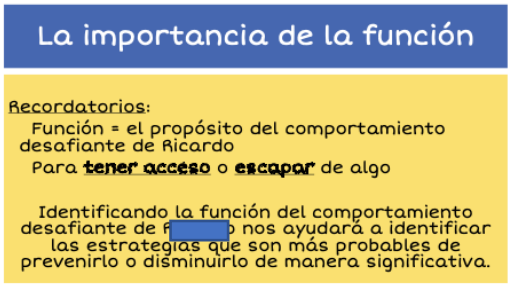
¿Preguntas?

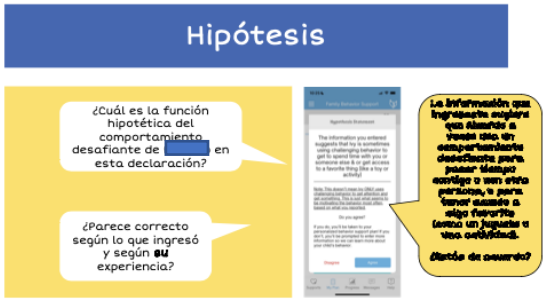
Appendix N

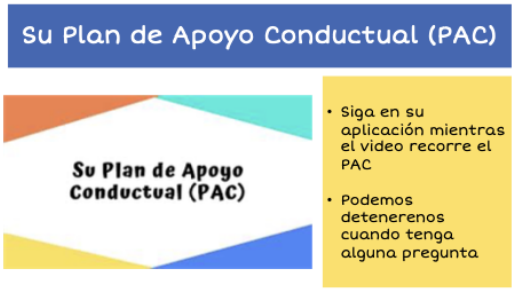
Example Behavior Support Plan (BSP) Overview Slides











Conectado el PAC con el ABC...

Estrategias de Prevención reemplazando Antecedentes

- A diferencia de los antecedentes que son probables de detonar el comportamiento desafiante, **estrategias de prevención** son las que puedes aplicar para **prevenir** o **reducir** la probabilidad de que ocurra el comportamiento desafiante.

¿Cuáles estrategias de prevención están en el PAC de [redacted]?

Nuevas Habilidades Reemplazan el comportamiento desafiante

- **Estrategias de Enseñanza** son formas en las que puede enseñarle a su hijo **nuevas habilidades** para utilizar en lugar de un comportamiento desafiante, para satisfacer sus necesidades.

Cuando su hijo aprenda que estas nuevas habilidades funcionan mejor que el comportamiento desafiante, ¡comenzará a usarlas cada vez más!

¿Cuáles nuevas habilidades se enlistan en estrategias de enseñanza en el PAC de [redacted]

Discutiendo la nueva habilidad de Ricardo

- Es importante que la nueva habilidad de su hijo sea más efectiva que el comportamiento desafiante para satisfacer sus necesidades.

¿Cuál es una forma preferible y razonable para que Ricardo obtenga lo que quiere?

Estrategia de Nueva Respuesta reemplazan las consecuencias

- Al igual que las consecuencias, las **nuevas estrategias de respuesta** son una respuesta al comportamiento desafiante de su hijo.

- Sin embargo, a diferencia de las consecuencias, **es poco probable que las estrategias de nueva respuesta** refuercen el comportamiento desafiante. Esto ayuda a Ricardo a comprender que el comportamiento desafiante no "funcionará" para obtener lo que quiere.

¿Cuáles estrategias de nueva respuesta aparecen en el PAC de [redacted]

Conectando el PAC con ABC

Estrategias Universales de Apoyo

- Las estrategias universales las pueden aplicar en cualquier momento y son de beneficio para todos los niños, independientemente de la función de su conducta desafiante.

- Algunos ejemplos son: establecer expectativas claras, utilizar un horario visual, Primero-Luego de forma visual / verbal, retroalimentación descriptiva positiva y etiquetar los sentimientos.

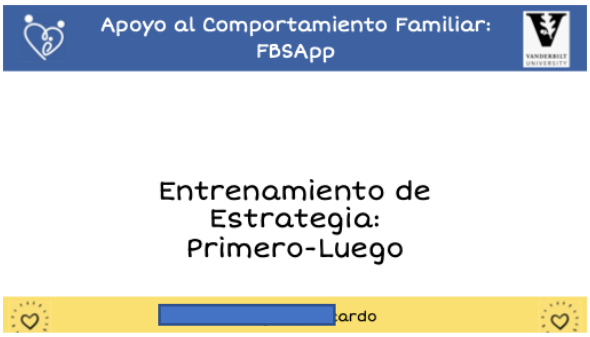
¡Aquí es en donde empezamos!

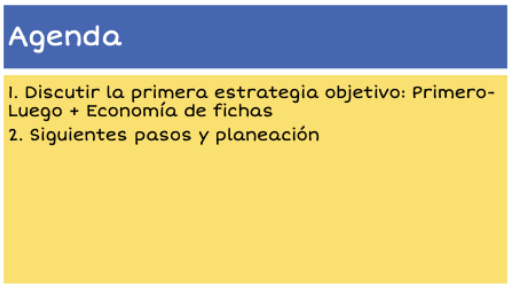
Siguientes pasos

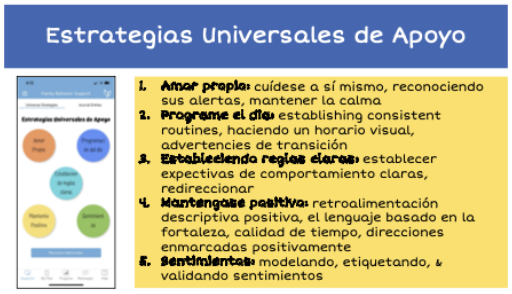
1. ¿Qué sigue?... ¡dos observaciones más y luego entrenamiento!
2. Confirmar la rutina
3. El entrenamiento empezará con una pequeña capacitación en la estrategia universal objetivo.
4. El entrenador se acercará para agendar (la próxima semana?)

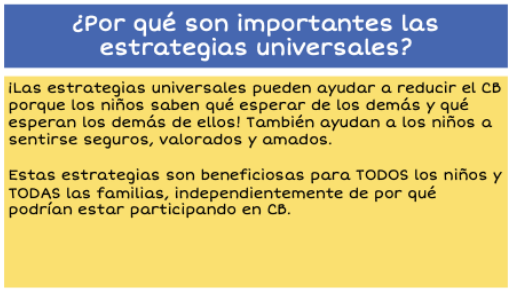
Appendix O

Example Behavioral Skills Training (BST) Slides









Estrategias Universales de Apoyo

Primero-Luego
Economía de fichas

Primero-Luego + Economía de fichas

Primero-Luego + Economía de fichas

1. Introducir ANTES de comenzar la rutina
   - "¡Primero comer, luego iPad! Tienes que sentarte a la mesa y comer CINCO bocados de pollo antes de poder tener un iPad".
   - Lenguaje claro, sencillo y énfasis en [redacted]Ricardo DEBE hacer

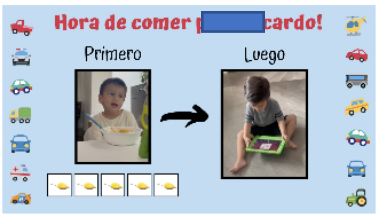
2. Referencia a lo largo de la rutina
   - En respuesta al comportamiento deseado: "¡Tomaste otro bocado! ¡Camino a seguir! ¡Ahora solo un bocado más y ya está!
   - En respuesta a CB: "Recuerda, cuatro bocados más y luego iPad"

3. Sigue después de la rutina
   - "¡Lo hiciste! Te comiste toda tu cena. ¡Aquí está el iPad!"

TIPS

1. Comience con una ficha por cada bocado para ayudar a Ricardo a comprender cómo funciona el sistema.
2. Usa gestos, recordatorios verbales e indicaciones físicas para ayud[redacted]ardo a cumplir con la demanda.
3. Combine el token con comentarios positivos ("¡Buen trabajo comiendo!" o "¡Gracias por tomar un bocado!")

Práctica: Primero-Luego



Siguientes pasos

- Practique el uso de la estrategia durante la hora de la comida [redacted]cardo
- Continuar grabando y subiendo videos
- Envía un mensaje a Claire/Caty en WhatsApp si tienes alguna pregunta.
- Nos reuniremos a través de Zoom en 1 o 2 semanas para tocar la base, resolver problemas y continuar refinando esta estrategia, ¡o pasar a la siguiente!

Appendix P

Example Completed Procedural Fidelity (PF) Checklists

Introductory Meeting Fidelity

Date of Training: 3/10/23 **Implementer: CJG**
Family ID: family 01 **Data Collector: AKH**

Behavior	Correct Implementation?	
Introduction		
Coach greets family and briefly reviews agenda	**Y**	N
Coach briefly explains their role in the study	**Y**	N
FBSApp Installation		
Coach confirms family has *installed the app* **or** walks them through the process if not	**Y**	N
Coach confirms family has *created an account* **or** walks them through the process if not	**Y**	N
Coach confirms family has *added the researchers and coach as a professional* **or** walks them through the process if not	**Y**	N
Child Information		
Coach asks family to enter basic child information on app	**Y**	N
Coach asks family to enter child's communication on app **and** explains that challenging behavior may be a form of communication for some children	**Y**	N
Coach asks family to enter child preferences on app	**Y**	N
Universal Supports page		
Coach briefly explains general purpose and functionality of universal support strategies	**Y**	N
Coach describes logistics of universal supports page (including logging into the app once per day over next four days)	**Y**	N
Review Next Steps		
Coach sends pre-study questionnaire and asks family to complete before next meeting (*Claire will send after!*)	Y	N
Coach reminds family about recording and uploading pre-baseline videos	**Y**	N
Coach asks and answers any questions the family has **or** makes a plan to follow-up regarding any questions not answered	**Y**	N
Coach tells family that she will reach out to schedule the next meeting (ABC meeting)	**Y**	N
Total:	14	
Percentage Correct (Total Y / Total Y + N)		100%

Notes:

- D is wondering if it is possible for her to get the app in Spanish if her phone is in English?
- Can we share with her a Youtube link where she can access all of the App videos in Spanish?
- What is the timeline for the baseline vidoes? When should she have those turned in by? (would like a specific date)
- Link to watch the recording of the meeting: https://vanderbilt.zoom.us/rec/share/KrFTCSkY-9uN3lOphhQE9KNeTwkdHa0b41K5J_klRoGVaEz0ls-O_JDBUgn4wcB3.t1f4nMy-7nWTU7MS

BST Procedural Fidelity				
Date: 4/6/23	Family: Jimenez			
Coach: CGJ Data collector: CRW	Session ID: Universal BST			
BST Components	**Y**	**N**	**N/A**	**Notes/Comments:**
Welcome statement to families	X			
Reviews agenda	X			
Asks family 1-2 questions about their experience since last meeting Tally	X |			
Reviews the following points regarding universal strategies: • Introduce all strategies • Discuss purpose • Discuss importance	X X			
Introduce target strategy (transition warnings)	X			
Walk family through accessing the transition warnings infographic	X			
Direct instruction on transition warnings: • Describe key elements of transition warnings - Warning pre-transition - Visual component - Reminders and follow through after • Give examples of transition warnings • Talk with family about examples	X			
Scaffolded Scenario Practice: • Prompt caregiver to give example of transition warning in context • Support caregiver (if needed) to come up with example of transition warning	 X X			
Review baseline data (graphically or descriptively)	X			
Discuss next steps	X			
Give reminder about recording and uploading videos	X			
Schedule next coaching session	X			
Totals	16	0	0	

Total Scored Components (total yes + total no): 16

Total YES: 16

Total NO: 0

% Fidelity = $\frac{total\ yes}{total\ yes + total\ no}$ x 100

% Fidelity = 100%

Notes: A little bit distracted by D and little sister, Caty recommended a specific transition song, mom is excited to try new strategy

Appendix Q

Social Validity Questionnaires

Family Check-in

Name / nombre: _____

How often has your child been engaging in challenging behavior lately?

¿Con qué frecuencia su hijo ha tenido un comportamiento desafiante últimamente?

Not at all / para nada — Way more than usual / mucho más de lo habitual

(Place a mark on the scale above)

How impactful has your child's challenging behavior been lately?

¿Qué tan impactante ha sido el comportamiento desafiante de su hijo últimamente?

Not an issue at all / no es un problema — Very problematic / muy problemático

(Place a mark on the scale above)

How confident do you feel addressing your child's challenging behaviors?

¿Qué tan seguro se siente al abordar los comportamientos desafiantes de su hijo?

Very confident / muy seguro — Not confident at all / nada seguro

(Place a mark on the scale above)

What would help you to feel more confident?

¿Qué te ayudaría a sentirte más seguro? _____

How satisfied do you feel with the FBSApp?

¿Qué tan satisfecho se siente con la FBSApp Español?

Very satisfied / muy satisfecho — Not satisfied at all / nada satisfecho

(Place a mark on the scale above)

How satisfied do you feel with the coaching you've received?

¿Qué tan satisfecho se siente con el coaching que ha recibido?

Very satisfied / muy satisfecho — Not satisfied at all / nada satisfecho

(Place a mark on the scale above)

Is there anything you would change about the support you're receiving? ◯ Yes / Sí ◯ No

¿Hay algo que cambiaría sobre el apoyo que está recibiendo?

Please describe:

Por favor describa: _____

Is there anything else you want us to know?

¿Hay algo más que quiera que sepamos? _____

Family Post-Questionnaire

Please complete the survey below.

Thank you!

1) How satisfied are you with your relationship with your child?
- ◯ Very satisfied
- ◯ Somewhat satisfied
- ◯ Neutral
- ◯ Unsatisfied
- ◯ Very unsatisfied

2) How often does your child engage in challenging behaviors?
- ◯ About once per month
- ◯ About once per week
- ◯ A few times per week
- ◯ Daily
- ◯ Multiple times per day

3) To what extent does this behavior negatively impact you and your family's life?
- ◯ Significant impact
- ◯ Some impact
- ◯ A little impact
- ◯ No impact

4) How confident do you feel using strategies to prevent your child's challenging behavior?
- ◯ Very confident
- ◯ Somewhat confident
- ◯ Not very confident
- ◯ Not confident at all

5) How confident do you feel teaching your child to use their words instead of challenging behavior?
- ◯ Very confident
- ◯ Somewhat confident
- ◯ Not very confident
- ◯ Not confident at all

6) To what extent do you feel your child communicates their wants and needs in an appropriate way?
- ◯ All the time
- ◯ Often
- ◯ Sometimes
- ◯ Not very often
- ◯ Never

7) How confident do you feel in responding to your child's challenging behaviors?
- ◯ Very confident
- ◯ Somewhat confident
- ◯ Not very confident
- ◯ Not confident at al

8) How satisfied are you with the FBSApp Español?
- ◯ Very satisfied
- ◯ Pretty satisfied
- ◯ Satisfied
- ◯ Not too satisfied
- ◯ Not satisfied at all

9) How satisfied are you with the coaching you've received?
- ◯ Very satisfied
- ◯ Pretty satisfied
- ◯ Satisfied
- ◯ Not too satisfied
- ◯ Not satisfied at all

10) How satisfied are you with your experience in this study?
- ◯ Very satisfied
- ◯ Pretty satisfied
- ◯ Satisfied
- ◯ Not too satisfied
- ◯ Not satisfied at all

11) What was the most useful aspect of participating in this study?
_____

12) What was the most useful component of the app?
_____

13) What was the least useful aspect of participating in this study?
_____

14) How likely are you to use the FBSApp Español in the future?
- ◯ Very likely
- ◯ I might use it
- ◯ I probably won't
- ◯ I definitely won't

15) How likely are you to recommend the FBSApp Español to other families?
- ◯ Very likely
- ◯ Pretty likely
- ◯ I might
- ◯ I probably won't
- ◯ I definitely won't

16) How appropriate do you feel the app is for Spanish-speaking families of young children with challenging behaviors?
- ◯ Very appropriate
- ◯ Pretty appropriate
- ◯ Neutral
- ◯ Not too appropriate
- ◯ Not appropriate at all

17) How appropriate do you feel the coaching procedures are for Spanish-speaking families of young children with challenging behaviors?
- ◯ Very appropriate
- ◯ Pretty appropriate
- ◯ Neutral
- ◯ Not too appropriate
- ◯ Not appropriate at all

18) What changes, if any, would you make to the app or procedures?
_____

19) Is there anything else you'd like for us to know?
_____