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SIG 1**Research Article**

Gathering Perspectives on Video- and App-Based Language Instruction: A Technology-Based Coaching Intervention to Increase Spanish-Speaking Latino Caregivers' Use of Naturalistic Language Intervention Strategies

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ABSTRACT

Purpose: Few caregiver-implemented naturalistic language interventions (NLI) are available for Spanish-speaking Latinos who have young children under 3 years with language delays, and there is a scarcity of studies that provide information about intervention development or social validity of interventions for this group. This study introduces Video- and App-Based Language Instruction (VALI) as a technology-based caregiver-coaching intervention being developed to increase caregivers' use of Spanish language-promoting strategies in everyday activities with their infants and toddlers.

Method: Fifteen participants including caregivers, speech-language pathologists, and researchers completed an online survey and participated in focus groups to share their perspectives on the feasibility, acceptability, and usefulness of the first iteration of VALI. Data were summarized with descriptive statistics and thematic analysis.

Results: Participants generally provided support for VALI and thought caregivers could use the technology-based intervention within naturalistic interactions. VALI materials received positive ratings for appearance, inclusivity, and understandability. Specific suggestions were provided for semantic and syntactic adjustments. Participants shared comments to improve individual VALI strategies and help ensure the asynchronous coaching procedures and targeted outcomes were culturally acceptable.

Conclusions: The first iteration of VALI appears to be a promising NLI for use by Spanish-speaking Latino caregivers with their young children. After initial adaptations are made based on findings from this study, additional feasibility and efficacy evaluations should be conducted. Recommendations for further development of VALI have implications for application in similar interventions for Spanish-speaking Latino caregivers.

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Caregiver-implemented naturalistic language interventions (NLIs), such as responsive interactions and providing opportunities for communication, are evidence-based approaches to supporting communication outcomes for young children with or at-risk for language delays (e.g., Roberts et al., 2019; Roberts & Kaiser, 2011).

Although inconsistently used in practice (e.g., Sawyer & Campbell, 2017), these interventions are often supported by speech-language pathologists (SLPs) and can be delivered within the child's and family's everyday activities and routines, building on naturally occurring learning opportunities and reflecting family culture (Romano et al., 2022). A caregiver coaching approach that includes opportunities for caregiver practice and feedback is an effective way to teach caregivers how to use NLI strategies (Sone et al., 2021) and helps ensure that strategies are used even when the SLP is not present.

Despite the benefits of caregiver-implemented NLIs, most research on these practices is centered on White, English-speaking children and families, and relatively few studies have examined their use with families from other racial, ethnic, and linguistic backgrounds (e.g., Akamoglu & Meadan, 2018; Roberts & Kaiser, 2011). Among language interventions that are tested with dual-language learners (DLLs), researchers report changes to linguistic (e.g., translating) components of the intervention more often than considering culture, although interventions that are both culturally and linguistically adapted tend to be more effective for increasing communication outcomes (Larson, Cycyk, et al., 2020). Regardless of intervention effectiveness, if the goals, procedures, and desired effects (i.e., social validity) of an intervention are not acceptable, it is unlikely to be used (Wolf, 1978). In a review of language interventions for young DLLs, Larson and An et al. (2020) found that social validity information was rarely gathered from participants or others invested in the study outcomes. Adapting interventions and determining their acceptability for family language and culture is essential for SLPs to promote culturally responsive and sustaining interventions (Horton & Munoz, 2021). Yet, few studies have reported using formal adaptation processes for caregiver-implemented language interventions (Albin et al., 2022; Cycyk et al., 2021).

Latino¹ children and families are one of the largest groups receiving early intervention (EI) across the United States, representing more than a quarter (27.23%) of those served in Part C programs (U.S. Department of Education, 2022). On average, 85% of Latino parents speak Spanish to their young children (Lopez et al., 2018), and it may be assumed that the majority of Latino children and families in EI use Spanish. In contrast to the large proportion of Spanish speakers participating in EI systems, only a fraction (approximately 5%) of American Speech-Language-Hearing Association (ASHA)-certified

SLPs self-identify as Spanish speakers (ASHA, 2022). Furthermore, most Spanish-English bilingual SLPs reside in four states (Texas, Florida, California, and New York; ASHA, 2022). Limited access to Spanish-speaking SLPs along with a relative dearth of research on caregiver-implemented NLIs for Spanish-speaking Latinos is likely to contribute to challenges among Spanish-speaking Latino families as they access services to support their children's communication development.

Technology-based interventions that improve access to bilingual SLPs, acting as caregiver coaches who employ culturally responsive intervention strategies, may be useful for supporting caregiver implementation of NLIs and improving communication outcomes in young Spanish-learning Latino children. In this study, we describe the development of Video- and App-Based Language Instruction (VALI) as a technology-based caregiver-coaching intervention to increase caregivers' use of NLIs with their young children with or at-risk for language delays. We discuss the processes used to develop VALI and to gather perspectives about its feasibility, acceptability, and usefulness from caregivers, SLPs (i.e., practitioners who would serve as caregiver coaches), and researchers from (or familiar with) Spanish-speaking Latino populations and NLIs. We also share the results of participants' perspectives on the elements of VALI along with suggestions for improving future iterations of this and other caregiver-implemented NLIs.

The Importance of Early Talk in the Heritage Language

Frequent, high-quality communicative transactions between caregivers and their children, coined as *Language Nutrition* (Zauche et al., 2016), set the foundation for early language development and learning cross-culturally (Tamis-LeMonda et al., 2014). Child-directed speech used by Spanish-speaking caregivers is positively associated with children's Spanish and English expressive vocabulary scores (Marchman et al., 2017) in the early years and predicts later vocabulary outcomes (Weisleder & Fernald, 2013). Child language delays may impact caregivers' use of complex language (Conti-Ramsden, 1990), expansions, and responsiveness to child communication attempts (Vigil et al., 2005) to the point where mothers of children suspected as having language delays spend approximately half as much time interacting in language-related tasks with their children as compared to mothers of children who are not suspected as having language delays (Alston & St. James-Roberts, 2005). It may be particularly important, therefore, to encourage caregivers to be persistent in their use of high-quality language interactions with their children who have language delays.

¹We use the word *Latino* to refer to any person who identifies as having Latin American origin or descent and also acknowledge other inclusive terms such as *Latinx* and *Latine* that may not be as widely known or frequently used (Noe-Bustamante et al., 2020).

Supporting caregivers who use heritage languages² (e.g., Spanish) and have children with language delays is especially critical. Despite the many benefits of bilingualism (e.g., Bialystok & Martin, 2004; Oades-Sese et al., 2011), a deficit view of bilingualism remains prevalent in American education systems (Nieto, 2009) and within research with emergent bilinguals with disabilities (Soto-Boykin et al., 2021). Deficit-based views of bilingualism perpetuate myths around multilingual development and fail to recognize bi-/multilingualism as a benefit—especially when considering bilingualism for children from marginalized backgrounds (e.g., those who speak heritage languages). These views may impact caregivers' willingness to use heritage languages in interactions with their young children, even though a strong foundation in Spanish can promote bilingualism in children with language delays and helps maintain connections to the home culture (Wong-Fillmore, 1991). Unfortunately, professionals continue to erroneously suggest that bilingual caregivers use only English to support their children's communication development even when bilingual interventions support language outcomes better than English-only interventions (Cheatham & Jimenez-Silva, 2012). Eliminating heritage language use may lead to fewer and lower-quality caregiver-child interactions (Kremer-Sadlik, 2005).

Caregiver-Implemented NLIs for Latinos

Naturalistic interventions are used in the context of children's everyday environments and implemented by individuals with whom the child regularly engages in routine interactions (e.g., parents, grandparents, siblings). The strategies associated with these interventions have naturally occurring antecedents and consequences based on child interests and address functional skills needed within the immediate setting (Rule et al., 1998). NLI strategies include caregivers' linguistic mapping based on child actions and interests, providing contingent responses to their child's communication (including expanding on children's communication), and providing opportunities for communication by offering choices, using wait time, or asking questions. Recent studies have demonstrated Spanish-speaking Latino caregivers' success in implementing NLIs and associated child communication outcomes (e.g., Cycyk et al., 2020; Peredo et al., 2017, 2022). Given the profound impact of culture on language interactions (Schieffelin & Ochs, 1986), Spanish-speaking Latino families' thoughts, experiences, and preferences related to these naturalistic language-promoting strategies must be considered.

²“A language qualifies as a *heritage language* if it is a language spoken at home...and this language is not a dominant language of the larger (national) society” (Rothman, 2009, p. 156).

There is great variability within Spanish-speaking Latino families living in the United States and in the caregiving approaches they use with their young children. The interdependent-independent caregiving continuum is helpful to consider as it relates to NLIs for this population. Traditional language intervention approaches typically align with a more independent (i.e., individualistic) caregiving style that centers children's interests and encourages frequent child-initiated communication. In contrast, caregivers who use interdependent interaction styles may direct a child's attention in conversation more frequently than they follow the child's lead and use explicit teaching in interactions. Caregivers using interdependent (i.e., collectivist) styles may also prioritize supporting children's social development (rather than language development) to encourage children to be respectful and contributing members in their family (e.g., Greenfield et al., 2006; van Kleeck, 1994). While Latino families more often ascribe to an interdependent approach, independent caregiving styles are also used (e.g., Guiberson & Ferris, 2019).

The acceptability of NLIs by Latino caregivers was specifically examined by Cycyk and Huerta (2020). Participants in this study ($N = 37$) held perspectives that reflected affiliations with both individualistic and interdependent caregiving styles. For example, caregivers supported interdependent approaches to provide children with limited choices (instead of open-ended choices) and had higher acceptance levels for communicating with their children in activities other than play (although play and shared book reading were largely accepted). Strategies like following the child's lead were among the least acceptable, but participants supported many other traditional language strategies (e.g., increasing the amount of talk used with their young children, expanding, using linguistic mapping, turn-taking, and imitating). Among reasons listed for accepting these, however, was that families learned about them from educators.

Other recent studies have explored the acceptance of caregiver-implemented language intervention approaches with Latino families who have children with or at-risk for delays. Cycyk et al. (2020) developed and tested the feasibility of LAPE-e (Language and Play Every Day—en Español), an adapted communication intervention using group and individual coaching, with six Spanish-speaking Mexican immigrant families. Participants were highly satisfied with the cultural appropriateness of the intervention, mentioning that they liked the expansion strategy (*+I respond to something new*) best and appreciated having access to interventions that White, English-speaking caregivers have access to. Participants showed promising gains in their use of specific strategies to identify and engage in communication activities, create communication

opportunities, use responsive interactions, and repeat and expand on their child's communication attempts. Caregiver confidence and knowledge of strategies and child outcomes (e.g., vocabulary and rate of communication) also increased after participating in the intervention.

Peredo et al. (2017) documented the initial development and efficacy of EMT en Español (Enhanced Milieu Training) with three Spanish-speaking mothers with Mexican heritage. Initial development with Spanish-speaking providers resulted in adjustments to strategies like following the child's lead while maintaining the Teach-Model-Coach-Review process used as part of caregiver coaching as it was initially designed (Roberts et al., 2014). Following researcher-supported teaching and coaching, all mothers increased their use of targeted strategies (i.e., matched turns, target talk, expansions, and communication elicitation [time delay or milieu prompt]) and reported high levels of acceptability of the intervention. Furthermore, all children demonstrated pre-post gains from baseline through the end of intervention in their use of spontaneous words during a naturalistic language sample, and two of the three children showed increases in the number of different words used.

These results were replicated by Peredo et al. (2022) in a randomized controlled trial with 20 Spanish-speaking Latino caregivers who received 24 training and caregiver coaching sessions. Caregivers receiving the intervention demonstrated statistically significant changes in their use of matched turns, expansions, and child language targets. Child language outcomes also increased for those in the intervention group, and statistically significant differences were found between the control and experimental group in child receptive vocabulary at follow-up. As in Peredo et al. (2017), caregivers agreed that the intervention was effective and culturally appropriate.

Description of VALI

VALI expands on the limited number of naturalistic caregiver-coaching language interventions designed and evaluated with Spanish-speaking Latino caregivers who have children with or at-risk for communication delays. VALI is a multicomponent, technology-based intervention accessed via digital files (i.e., e-mail, text) and two app-based platforms. Using primarily asynchronous interactions, VALI provides access to a bilingual SLP who serves as a caregiver coach. The intervention allows for flexible delivery outside of typical home visit times.

Háblame Bebé

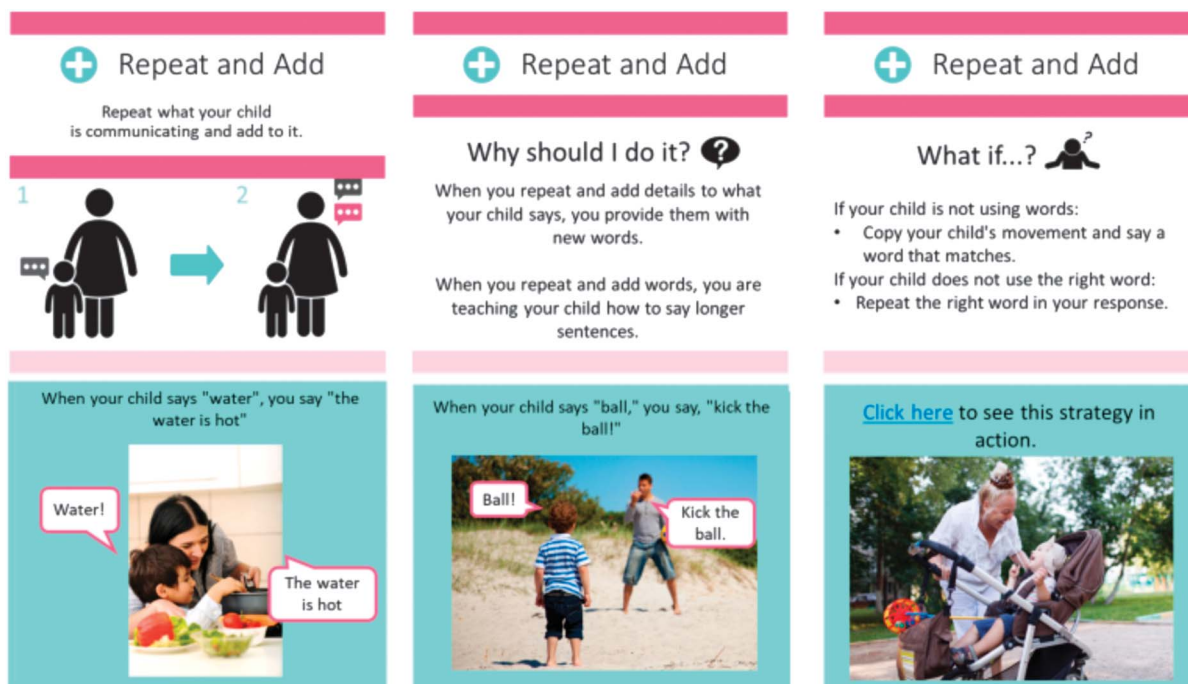
The first component of VALI uses Háblame Bebé, an iteratively designed mobile application (app) for Latino

families, alongside digital messaging (e.g., texts) to promote sociolinguistic pride and encourage families to use their heritage language(s). Initial testing of Háblame Bebé (which included frequent interactions with, and encouragement from, the research team) was associated with caregivers' increased word use with their young children (Baralt et al., 2020). As a standalone intervention, use of Háblame Bebé did not result in statistically significant changes in caregiver behaviors on average; however, potentially clinically meaningful child outcomes were noted by young children whose mothers used the app (Larson et al., 2022). Háblame Bebé content relevant to VALI includes written and video information (available in Spanish and English) on the importance of early talk for later pre-academic and academic outcomes and describes why caregivers should be proud to use the heritage language to promote bilingualism. As suggested by Wing et al. (2007), these foundational aspects of VALI help connect the focus on early language development to longer-term goals that are important to families. A list of *conversation starters* is also provided with direct prompts and sample phrases Spanish-speaking Latino caregivers might use while interacting with their child during preferred activities. As noted in Cycyk and Hammer (2020) and Larson et al. (2022), these activities include things like caregiving, cleaning and other chores, completing errands, and so forth. Conversation starter prompts model directives and explicit teaching as well as linguistic mapping as strategies associated with interdependent and individualistic caregiving styles, respectively (all of which are generally considered acceptable by Latino families; e.g., Cycyk & Huerta, 2020). For example, under the heading "Getting dressed," one prompt states, "Let's put your pants on now. Give me your leg to put in the pants... 1, 2, both legs through!"

NLI Strategies

The second major component of VALI extends the Háblame Bebé foundation with NLI strategies for caregiver implementation in everyday routines. VALI strategies are similar to those used in previous and ongoing research with Spanish-speaking Latinos (e.g., Cycyk et al., 2020; Peredo et al., 2017, 2022) and include: *observe and respond*, *repeat and add*, *provide a choice*, *give small portions*, *show it before you give it*, and *take turns*. Each strategy is described on a series of cards (see Figure 1) that can be sent to caregivers via digital message. Strategy cards use a consistent format that includes an easy-to-remember title with icon (e.g., magnifying glass), basic strategy description, icons showing strategy steps, strategy picture examples, an explanation of why caregivers might use the strategy, and additional suggestions for strategy use based on child communication level. Each

Figure 1. Example Video- and App-Based Language Instruction (VALI) strategy cards translated to English for *repeat and add*. VALI Version A. Copyright © Regents of the University of Minnesota. All rights reserved. Reprinted with permission.



strategy also includes a link to a brief video showing a Spanish-speaking caregiver modeling strategy use with their child.

Caregiver Coaching

The final component of VALI includes caregiver coaching from a Spanish-speaking SLP following a practice-based coaching approach (Snyder et al., 2022) including planning, observation, reflection, and feedback around caregivers' use of NLIs. An initial synchronous meeting will be held to gather information about individual family preferences around routines (e.g., caregiving, pre-academic, community, play) using an adaptation of the routines matrix from the Family Guided Routines-Based Intervention Manual (FGRBI Routines Coding System Manual, 2012). Caregivers then record themselves in their preferred routine using Flip, a web- or app-based platform that securely transfers videos from caregivers to the SLP. Caregivers reflect on their recordings (a meaningful but often omitted component of caregiver coaching models; see Lorio et al., 2020), and SLPs provide asynchronous video feedback using *caregiver practice with feedback* coaching strategies (Friedman et al., 2012). Specific feedback includes strengths-based comments on caregiver and child performance and participation, what went well, and reflective questions to help caregivers think about what could be done differently. After feedback, caregivers plan for

their next recording based on caregiver preference and SLP suggestions.

Development of VALI

VALI strategies and coaching procedures were developed with guidance from the initial phase of Domenech Rodríguez and Wieling's (2004) Cultural Adaptation Process Model (i.e., tailoring the intervention to the target population prior to testing) and Bernal's Ecological Validity Model (Bernal et al., 1995). To begin, the change agent (primary investigator) and opinion leaders (other members of the research team) specified VALI goals, procedures, and outcomes and reviewed the literature related to Spanish-speaking Latino children with language delays and their families, as well as the interventions designed for this population. Bernal's Ecological Validity Model (Bernal et al., 1995) provided a framework for cultural considerations related to each component of VALI as described below. Upon development of the first iteration of VALI, *community members* (the participants in this study) were invited to comment on Version A of the intervention.

Each of the eight dimensions of adaptation from the Ecological Validity Model was considered in the development of VALI. First, VALI intervention *goals* and procedures were considered. Given that VALI is designed for

families with concerns about their child's language development, alignment with the overall goal to support child communication outcomes was assumed. A focus on communication development by Latino families more generally is also supported by the literature (e.g., Cycyk & Hammer, 2020; Cycyk & Huerta, 2020). To account for intracultural variability in preferred communication routines, VALI coaching procedures include a brief interview aimed at understanding individual family preferences and patterns (Cycyk & Hammer, 2020). Initial adaptations for *method* include an emphasis on the family rather than a single caregiver and providing examples of VALI strategies used by different caregivers (i.e., mothers and fathers). In terms of *content*, it was noted that some caregivers may not perceive themselves as having a direct teaching role related to child language development in the early years (Cycyk & Hammer, 2020); therefore, additional information was gathered from study participants regarding the acceptability of this approach. Technology use and preferences were also explored with participants to determine whether the *context* of the intervention would meet the needs and preferences of Spanish-speaking Latino caregivers. An asynchronous format was thought to encourage intervention participation by multiple caregivers, which may be particularly relevant among Latino families (e.g., Cycyk & Huerta, 2020; Sarkisian et al., 2007). Use of technology was also supported given most Latino families in the United States (including those with incomes below the national median) have smart devices and Internet access (Rideout & Katz, 2016).

When developing VALI messaging, the research team also considered the sociolinguistic context for Latinos in the United States (Nieto, 2009) and the potential impacts of deficit views toward Latinos' bilingualism (and monolingual use of heritage languages) on child communication outcomes. A strengths-based approach was applied in intervention materials to encourage caregiver pride in being Latino and using Spanish with their young children. To develop VALI strategies, descriptions, and examples, the research team reviewed literature on the acceptability of NLIs (*content* and *concepts*) for Latino families. Less acceptable strategies such as following the child's lead and reducing questions in favor of using comments were omitted based on previous research (e.g., Cycyk & Huerta, 2020; Peredo et al., 2017). Similarly, specification was provided around the strategy, *provide a choice*, to suggest caregivers limit choices to include only acceptable options—allowing caregivers to preserve authority while also providing opportunities for child communication (Cycyk et al., 2021).

Persons depicted in VALI materials were selected to include diversity in age, skin color, and family make-up. A Spanish-speaking SLP who did not identify as Latina,

but had decades of experience supporting Latino families, was used as the VALI coach. Questions about the VALI coach's ethnic and linguistic background were posed to participants to learn more about any potential issues with cultural mismatch. The *language* used within VALI was carefully considered. Written and audio content was created in Spanish and English simultaneously using a collaborative process to identify content that could be translated from one language into the other while maintaining the use of short, simple sentences. Spanish–English cognates were considered whenever possible, such as the word “name” instead of “label” due to its similarity in phonological structure to the Spanish translation, “*nombre*.” In addition to providing content in multiple formats (e.g., written word, icons, pictures, videos), it was thought that these processes would improve understanding of VALI content (particularly for users with lower literacy levels). *Metaphors*, the final dimension for consideration by Bernal et al. (1995), were initially avoided based on the diversity of language varieties used by Spanish-speaking Latinos in the United States; however, participants were asked to share opinions on preferred terminology for strategy names, descriptions, and messaging within VALI that may be included in future iterations to improve understandability and familiarity with intervention content.

In the following sections, we describe the processes used to gather additional perspectives on the first version of VALI from Spanish-speaking caregivers with Latino heritage, bilingual SLPs (i.e., practitioners), and researchers with experience and expertise in developing and testing language interventions for Spanish-speaking populations. We were interested in understanding perspectives on the *feasibility* of implementing a technology-based coaching and caregiver-implemented language intervention, the *acceptability* of VALI and its alignment with the preferences and needs (including culture and linguistic variables) of the intended users, and the perceived *usefulness* of VALI for the intended recipients and the targeted intervention outcomes.

Method

This study was approved by the appropriate institutional review boards and followed all recommendations for the ethical conduct of research.

Researcher Description

All but one author are bilingual with native levels of English proficiency and varying levels of Spanish proficiency (from conversational to native). Three authors have Latino heritage (Costa Rican, Cuban, and Mexican), and

two of these authors use Spanish as their primary home language. Authors are all female and were raised in families that included varying degrees of interdependent and independent caregiving styles. Five authors are practicing, or training to be, SLPs or are researchers with a history of providing direct service to families of young children with communication delays. Some authors are caregivers who have had a direct caregiving responsibility for children with communication delays or disorders.

Participants

Fifteen participants contributed to this study via online survey and participation in individual interviews or focus groups. All participants were female with an average age of 35.5 years ($SD = 6.4$, range: 27–50). Caregivers ($n = 5$) were recruited from community centers and Part C programs in Minnesota but had no previous experience with VALI. Caregivers were eligible for the study if they reported that their child hears Spanish at least 50% of the time and if their family participated in a Part C program (within the last 12 months) while receiving support for communication development. At the time of the study, all caregiver participants had children who scored below the cutoff on the Ages and Stages Questionnaire–Third Edition (Spanish). All caregivers identified as Latina immigrant mothers with Mexican (Poblano), Peruvian (Afro/Indigenous), Salvadorean, and Guatemalan heritage. Caregivers' education background ranged from completing sixth grade ($n = 1$) to having a high school diploma ($n = 2$) or having an associate's ($n = 1$) or bachelor's ($n = 1$) degree. One mother was employed part time as a social service worker, while others did not report employment. Four caregivers received services through WIC (Women, Infants, and Children), SNAP (Supplemental Nutrition Assistance Program), or Medicaid. All were native Spanish speakers with varying English proficiency (*very well* [$n = 1$], *well* [$n = 3$], and *not well* [$n = 1$]).

SLPs ($n = 4$) were recruited via bilingual SLP social media sites and personal e-mails. They were eligible for the study if they had conversational, native, or native-like proficiency in Spanish and English; held a Certificate of Clinical Competence from ASHA; and reported spending more than 50% of their intervention time coaching caregivers versus working one-on-one with the child. Participating SLPs had master's degrees and worked in Part C programs in Pennsylvania, New York, Massachusetts, and New Mexico, with an average of 8.25 years of experience in this or a similar position. One SLP described her race as White, and the others described themselves as "Hispanic or Latino/a/x/e" with Colombian, Dominican, or Mexican heritage. Three reported speaking Spanish *very well* and one *well*. All SLPs had native levels of English proficiency.

Researchers ($n = 6$) were recruited by e-mail and were eligible for participation based on experience leading research with Spanish-speaking and bilingual caregivers and their young children with communication delays. All researchers had or were pursuing doctorate degrees and reported working in the field an average of 9.3 years ($SD = 6.2$, range: 2–19). Researchers identified as Latina ($n = 3$), with Mexican and Puerto Rican heritage, and/or White ($n = 5$). Researchers reported speaking Spanish *very well* ($n = 2$), *well* ($n = 3$), and *not well* ($n = 1$). All researchers had native levels of English proficiency.

Measures

Survey

Two versions of an online survey (one for caregivers, another for practitioners and researchers) were developed by the research team with support from a Spanish-speaking caregiver whose child received Part C services due to communication delay. The surveys consisted of 100–110 items (depending on participant group) that could be presented in Spanish or English. Survey items included multiple choice and open-ended questions, as well as opportunities to rank, highlight, and rate various components of VALI. Ratings were based on a 6-point scale: *strongly disagree*, *disagree*, *somewhat disagree*, *somewhat agree*, *agree*, and *strongly agree*. When participants selected disagreement with survey statements, they received a message thanking them for their honest feedback and were asked to describe why they disagreed (see Supplemental Material S1). The survey was divided into four sections.

One section of the survey asked participants to evaluate messaging statements about Language Nutrition and sociolinguistic pride—selecting words or phrases that did not sound right or were not easy to understand. Questions were also posed to ask whether receiving text messages about these topics would work well for caregivers, if the messages would be easy to implement during daily activities, and if the messages would encourage caregivers to use Spanish. Final questions in this section asked if caregivers' use of Language Nutrition and Spanish would help their child talk. Another section consisted of questions about VALI NLI strategies. Visual and written descriptions of each strategy were provided. In addition, a video was shared for *observe and respond*. Questions in this section were written to gather feedback about the design of the strategy cards and to identify words that did not sound right or were not understandable. Questions prompted caregivers to rate if it would be easy to use the strategies while talking with their child, their level of comfort using the strategies, and if they thought the strategy would help their child talk. SLPs and researchers provided

ratings based on their experience working with caregivers (e.g., caregivers' use of *observe and respond* will help their child talk). Questions about the video example asked whether the video was accessible via a link sent to participants, if the people and setting shown in the video was relatable (when keeping culture and language use in mind), and if video content supported understandability.

The final content-based section consisted of questions about VALI coaching including communication preferences between coaches and caregivers and translations rankings (including a category for participants to fill in their preferred translation). This section also assessed the feasibility of participating in asynchronous video coaching, level of comfort sharing videos, and if receiving feedback and creating an implementation plan would help caregivers support their child's language development. The survey concluded with a set of demographic questions.

Focus Groups

Four focus groups and four individual interviews were conducted for approximately 1 hr each via Zoom in Spanish and/or English. The second author served as a moderator and either the first or fourth author served as a note-taker in each meeting. Focus groups were video- and audio-recorded with one to four participants in each meeting depending on participant schedules and availability. Research team members provided a brief introduction at the beginning of each meeting to remind participants that the purpose of the meeting was to gather information to improve VALI for use with Spanish-speaking Latino families. Research team members also shared relevant positionality of the research team (e.g., race, ethnicity, linguistic background). A script with predetermined questions was created and used as a general outline for each meeting (see Supplemental Material S2). Participants were prompted to share their honest opinions about the components of VALI, with an emphasis on those that may be negative or critical. In addition, several questions were prefaced with a reminder that caregiver participants could answer based on their own experience or based on what they thought other Latino caregivers might say. Each participant responded to questions about VALI strategies and coaching procedures. Caregivers responded to additional questions about bilingualism and sociolinguistic pride, and SLPs and researchers discussed the VALI coaching manual. Research team members summarized the main points from the focus group with participants during the last few minutes of each meeting. Participants were then asked if they had anything to clarify or add to the summary.

Procedure

Participants received an e-mail with a video overview and link to download the *Háblame Bebé* app; links

and PDF copies of VALI coaching manual (for SLPs and researchers only) and VALI strategies; and a link to join a Flip topic with a sample introduction video from a VALI coach and sample caregiver-submitted video with coaching feedback. Caregivers were given the option of testing Flip by recording and sharing video-recorded interactions with their child. Participants without access to adequate technology were given a Samsung Galaxy Tab A7 Lite connected to mobile data through T-Mobile. The tablet was equipped with a rugged protective case with a kickstand and an adjustable desktop tablet holder to facilitate recording. Device functionality was limited to a user profile with access to *Háblame Bebé*, Flip, Zoom, camera, and photo gallery. Participants received a \$50 electronic gift card after completing the study.

Data Analysis

Descriptive statistics were used to analyze numerical data from the survey, including demographic data, rating scales, rankings, and like/dislike data. Participant ratings of VALI strategies (from *strongly disagree* to *strongly agree*) were tallied for each participant group and divided by the number of participants in that group to calculate a percent. Analyses were completed by combining caregiver, SLP, and researcher responses to identify overall trends as well as reporting by each participant group to identify differences in ratings between groups. Translation rankings were tallied to determine which option received the most votes. Data from participants' selection of *like* or *dislike* clicks on the strategy card examples were summarized using conditional formatting with graded color scales in Excel.

Three research team members used NVivo qualitative data analysis software (QSR International Pty Ltd., 2020) to analyze focus group data. The researchers agreed upon a priori coding about VALI *feasibility* (accessing the components of the intervention, understanding the content, or implementing VALI procedures), *acceptability* (describing how the components of VALI correspond with participants' cultural beliefs, customs, or preferences), and *usefulness* (relating to the perceived need for the intervention by the intended recipients and the meaningfulness of achieving the targeted outcomes—including caregivers' use of Spanish, caregivers' knowledge and use of VALI strategies, and children's expressive communication). Each main code (e.g., feasibility, acceptability, and usefulness) had four or five child-level codes that could be further coded as *positive* or *constructive*. Codes (Table 1) were developed by the research team using a process described by Braun and Clarke (2006) where researchers generated initial codes after becoming familiar with focus group data through transcription, note-taking, or reading. Initial

Table 1. Codes used to analyze participant comments.

Code	Definition	Example
Positive	Describes something that the participant liked or agreed with	“...con las palabras que están allí como en una burbujita, eso se me hace bien claro” <...with the words that are there in the little bubbles, this makes it really clear to me.>
Constructive	Describes something the participant disliked or thought should be changed	“I didn’t really like Flip[Grid] to be honest with you.”
Feasibility		
Routines	Describes the ability or willingness to use VALI strategies in daily routines and activities	“I really love that you’re helping parents see that they can embed communication language strategies in their everyday routines...”
Access	Describes VALI usability in terms of reading ability, technological literacy, and technological resources needed to access the intervention	“...just cutting some words out in certain places to just make it really accessible, given the range of literacy levels that you’re likely to encounter, I think would be helpful.”
Understandability	Describes the ability to understand the intervention and its components	“Toma tu turno es algo súper complicado para los niños, por lo menos para mi hijo. No lo entiende, no sé si por la edad... por falta de madurez... pues no él va primero y ya.” <Taking turns is really complicated for kids, at least for my son. He doesn’t understand it. I don’t know if it’s because of his age... lack of maturity... but no he goes first and that’s it.>
Use of similar resources	Describes use (or nonuse) of similar resources or technology	“Toda la información es muy valiosa. No he encontrado algo así antes entonces es bastante ya con que esté allá afuera.” <All of the information is very valuable. I haven’t found something like this, so it’s a lot that it’s already out there.>
Acceptability		
Appearance	Describes the appeal of the materials (color scheme, pictures, icons, etc.)	“Para mi me pareció bien hasta los colores, todo a mí me gustó.” <For me, it looked good, even the colors, I liked everything.>
Language use	Describes the accuracy or appropriateness of the syntax, semantics, spelling, and punctuation used in the intervention	“[Include] the double exclamation points or double question marks... it feels very authentic rather than ‘Oh, this was translated from English to Spanish.’”
Caregiver–child relationship	Describes the interactions between the caregiver and the child (e.g., caregivers being in the role of teaching their child and caregivers’ comfort in using the VALI strategies with their child)	“...es algo que nosotros mismos tenemos que enseñar a sentirnos cómodos con el esperar. Y que esto es para ayudarlos a ellos a llegar a su respuesta, o a crecer su cerebro.” <...it’s something that we have to teach ourselves to feel comfortable with waiting. And that this is to help them reach their answer or grow their brain.>
Caregiver–coach relationship	Describes the relationship between VALI coaches and caregivers	“Culturally it’s more of the job of the teacher and professionals to help kids learn at school and it’s the parents’ role to be more of the caretaker and the behavior management.”
Usefulness		
Use of heritage language	Describes how VALI encourages the use of the heritage language (typically Spanish) and/or promotes multilingualism	“Le digo es que le tengo que enseñar a las futuras generaciones de mi familia que venimos de hablar español.” <I tell him that I have to teach the future generations of my family that we come from speaking Spanish (we have Spanish-speaking roots).>
Caregiver outcomes	Describes the usefulness of VALI as related to behavioral changes in caregivers using the intervention	“Eso fue lo que me llama la atención, ver cosas nuevas de que como hablarle y cómo seguirle... [enseñarle] más.” <That’s what caught my attention, seeing new things on how to talk to him and how to keep...teach him more.>
Child outcomes	Describes the usefulness of VALI as related to behavioral changes in children	“Y ahorita con todo lo que ha estado leyendo de VALI todo ahora él ya me apunta o me hace señas hacia dónde quiere que vayamos.” <And now with everything I’ve been reading about VALI, now he points at me or makes signs to where he wants us to go.>

Note. VALI = Video- and App-Based Language Instruction.

themes were created based on recurring ideas presented in the data. A codebook with a draft of code definitions and examples was reviewed, and codes were refined after attempting to apply them to a sample transcript that was not included in analysis. Upon finalizing codes and definitions, the first author trained two research assistants (with native-level Spanish proficiency) to greater than 80% agreement on all codes. Research assistants independently coded 20% of the participant sample (one caregiver, one SLP, and one researcher transcript). Coders had 93.87% agreement on child-level codes and 97.55% agreement when coding positive or constructive comments. All data were coded in the language(s) used during the interviews.

Results

All participants ($N = 15$) responded to the online survey and completed a focus group or individual interview. Very few participants skipped or missed survey questions with 97% of questions receiving a response across all participants. Caregivers completed the focus group in Spanish, while other participants used primarily English. In general, more positive than negative comments were shared about the VALI components. On survey ratings, participants

across all groups almost always *somewhat agreed*, *agreed*, or *strongly agreed* that VALI strategies would be easy for caregivers to use in everyday activities, that caregivers would be comfortable using the strategies, and that the strategies would be useful for increasing children's communication (see Figure 2). Analyses of focus group comments suggested that 63% of all comments were positive. The percentage of positive remarks during the focus groups did differ, however, between groups. Caregivers had a larger proportion of positive comments as compared to researchers and SLPs (74%, 54%, and 53%, respectively). The following section describes the remaining results organized by the feasibility, acceptability, and usefulness of the major VALI components.

Feasibility

Across all participants, most focus group comments were related to the feasibility of VALI (see Figure 3). Most of these were related to accessibility and understandability.

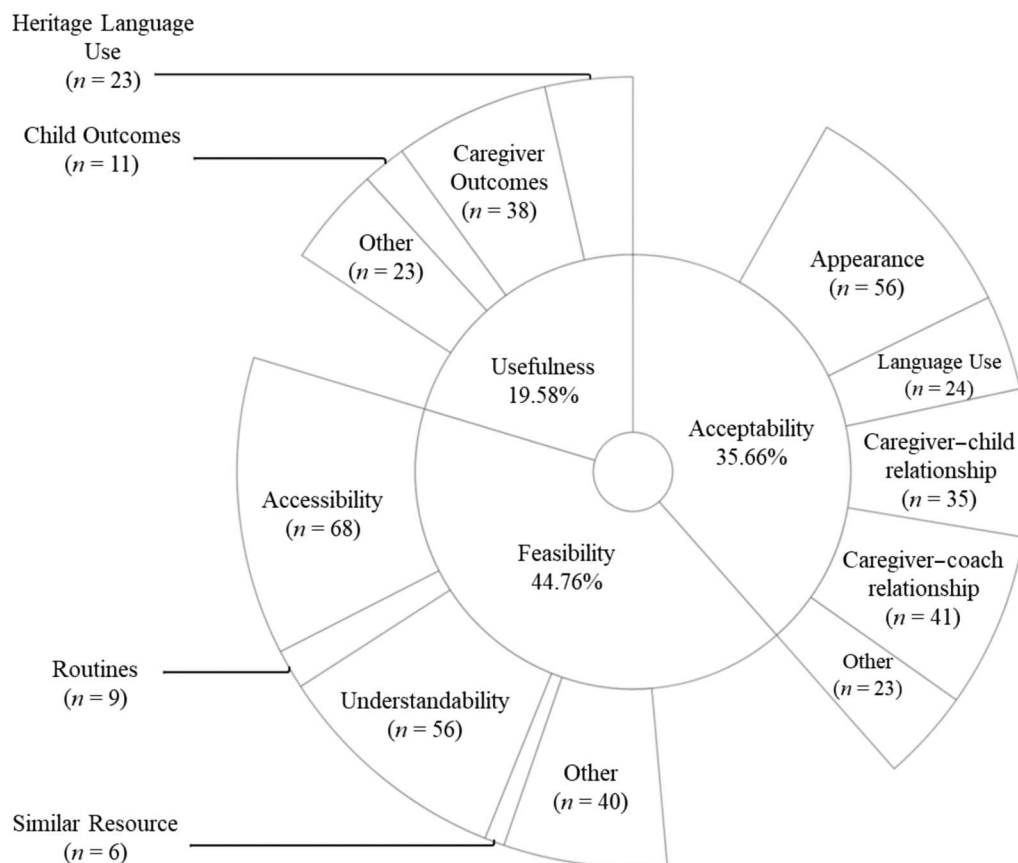
Accessibility

Assessing VALI's technological components was rated or described as feasible by most participants. All caregivers reported having access to technology for recording, and three had Internet available in their home. Regardless

Figure 2. Percentage of agreement ratings on Video- and App-Based Language Instruction (VALI) strategies by caregiver, practitioner (i.e., speech-language pathologist), and researcher participants.



Figure 3. Percentage of codes related to each major theme (feasibility, acceptability, and usefulness) and number of child-level codes under each major theme across all participant groups.



of technology access, caregivers reported a history of using technology when they have a question or concern about their child's talking (e.g., general Internet searches, websites, apps, and YouTube); however, their most frequent and preferred resource was to "talk to someone" (e.g., pediatrician, teacher, or SLP). One caregiver suggested it would be beneficial to have hard copies (rather than digital versions) of the VALI strategies. Results were mixed regarding the feasibility of recording and sending videos as part of VALI. Most caregivers and SLPs *agreed* or *strongly agreed* that it would be easy to record and send videos of interactions with their child. Researchers were more skeptical, and half *somewhat disagreed* that using videos would be feasible (others *somewhat agreed* or *agreed*).

Participant opinions varied when they were asked to identify their preferred communication methods to communicate with a VALI coach. Researchers ($n = 2$) were the only ones to suggest "in person" interactions between caregivers and VALI coaches should be used, though one researcher stated they would base "...the method of communication [that was used] on the caregiver's preference." Most caregivers suggested that phone calls and text

messages should be used to communicate with VALI coaches, but three caregivers also selected sending videos and receiving a video response as preferred communication options. Practically, few participants attempted, or were able, to log into the app-based coaching system (Flip) that was proposed for communication between caregivers and VALI coaches. Only two caregivers shared video recordings in Flip as part of their participation in this study, and several caregivers commented on having challenges with recording their interactions with their children. One mother attempted recording multiple times because her son would run away when she put the camera in front of them. Despite participant challenges recording and using Flip, however, one mother shared her enthusiasm for using video communication as part of VALI. She reflected that during the COVID-19 pandemic, videos served, "...como una forma de estar en contacto por la tecnología [as a way to stay in touch through technology]."

Use of Strategies Within Routines

Despite challenges with recording, most caregivers (and half of the researchers) *strongly agreed* that the VALI strategies would be easy to use with children in everyday

activities (see Figure 4). Fewer SLPs *strongly agreed* with the feasibility of implementing VALI strategies, but none disagreed. When researchers and caregivers *disagreed* with the feasibility of strategies, comments were unrelated to the ease of using the strategy. A researcher's comment was related to the look of the icons and two caregivers commented on child rather than caregiver behaviors. For example, a caregiver stated that, “*‘observa’ es una palabra para lenguaje adulto* [observe is a word used by adults],” and provided an alternative suggestion, “*mira* [look],” to use with children when commenting on the strategy description that was aimed at caregivers. Another caregiver said that “*a los niños no les gusta esperar turnos* [children don’t like to take turns],” when the onus on the turn-taking strategy is meant to be on the caregiver rather than child. These comments highlight the need for further explanation that VALI strategies are directed primarily at changing caregiver behaviors rather than requiring particular child responses.

Understandability

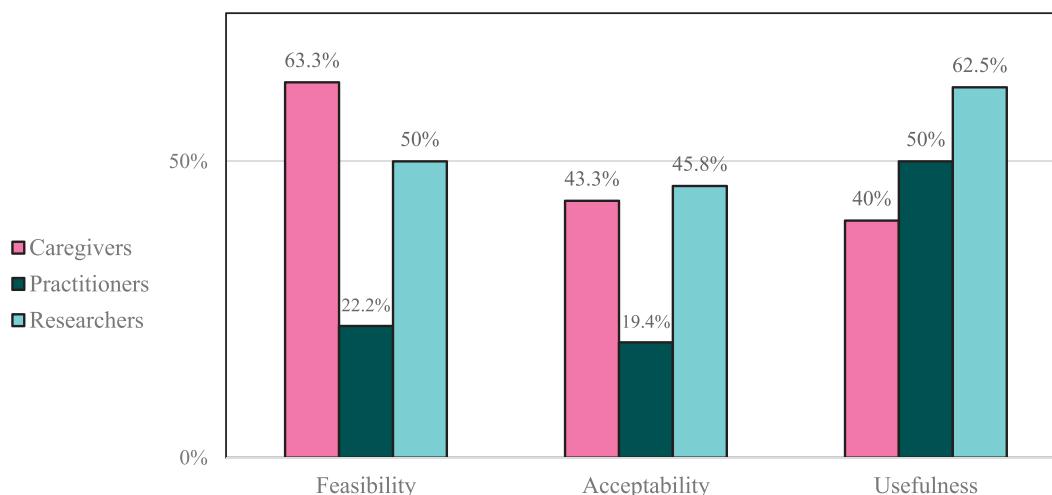
Additional data were gathered on the understandability of VALI components. Several researchers and SLPs expressed confusion over whether VALI supports monolingual Spanish use in addition to bilingualism (our intention is to support all types of language use based on family preferences, emphasizing the use of the heritage language[s]). Important suggestions were also provided to address myths about bilingualism and language delay—ensuring caregivers know that children with language delays can be raised bilingually. One SLP suggested that VALI materials should include more explicit wording about Latino caregivers’ experiences with linguisticism. A final comment related to VALI content was from a

researcher who expressed concern about a proposed text message that suggests caregivers “Try to avoid giving negative instructions such as ‘no’ and ‘stop.’” The researcher suggested that these instructions may interfere with some caregiving styles aligned with, “...parental authority and rearing well-behaved children [as] such a critical cultural value for some Spanish-speaking families.”

Other comments related to understandability were specific to VALI images and videos. Many more participants selected “like” on various sections of the strategy cards as compared to “dislike.” Most “liked” the icons and picture examples, including specific comments about how the word bubble examples helped with understanding. One caregiver, however, misinterpreted the image of a clock as a suggestion to *take turns* during a particular part of the day. She provided a suggestion for replacing this image with a sand timer that may more accurately depict wait time. Among the most “disliked” visuals were the strategy card titles and descriptions (12.2% and 15.6% across all strategies, respectively); however, constructive suggestions were related to language use and grammar (details listed below in the section on acceptability).

Many positive comments were relayed about the video examples and the clarity provided by using, “...animations as well [as] the captioning...” (as stated by a researcher). Another researcher appreciated the structure of the videos, “...you introduce the concept, you see it, and then it’s summarized back to the parents, so they really have multiple opportunities to understand.” Several participants shared enthusiasm for including information about why VALI strategies promote communication and what to do if the strategy use does not go as planned. One researcher stated, “...I’ve done a lot of research in early

Figure 4. Percentage of caregiver, practitioner (i.e., speech-language pathologist), and researcher participants who *strongly agreed* that Video- and App-Based Language Instruction (VALI) strategies were feasible, acceptable, and useful.



intervention and families can like name strategies... but...they really have no idea why [they should use them]...that is so critical that you're telling families why and what to do...like trouble shooting." An SLP suggested adding more picture examples (i.e., running errands) and differentiating materials based on participant location. She shared that a family that lives in New York engaging with their child in, "...the metro, laundromat, *bodega* [grocery store], like trying to make it more contextual...then like here, you know New Mexico, different, you know, climate."

Acceptability

Most comments about the acceptability of VALI were related to the appearance of the materials and participants' thoughts about caregiver-child and caregiver-coach interactions. Several comments were also shared about the semantics and syntax used in VALI materials.

Appearance

Many participants had positive comments about the look of VALI materials, like this researcher who said, "I was really excited to see the graphics and just a visual display of all of the materials is really beautiful and accessible and well organized..." More specific comments were provided about the layout of the strategy cards, and several participants appreciated the consistency in formatting. Other comments were related to the videos, and a researcher noted, "...the video in itself is just really wonderful. It's just that little piece, I know how hard it is to get videos." Two SLPs also commented on the importance of having the caregiver and child shown at the same time so that, "...you still see them in the frame at the same time and watch what's happening (boy points, then dad points), so the angle of that [the] scene is, like you get the whole scene." When asked to comment on whether the pictures and video were representative of Latinos, one SLP suggested use of, "...images that are representative of our community," but did not elaborate. Other participants appreciated the diversity in the pictures. A researcher said, "I love that you have such a diverse range of family compositions here..." and an SLP commented positively on the inclusion of images with Black families. Participants were excited to hear about plans to replace stock images used on the strategy cards with those that may be shared by family participants in future VALI studies—particularly those that may include grandparents and siblings.

Almost all participants commented positively about showing a dad in the video. An SLP said, "...that's big because you don't see that a lot so things like that, those like subtle inclusion, and I think that's what an app...like this needs..." Although participants noticed that the

mother in the video models was not a native Spanish speaker, one caregiver commented, "*cuando vi el video... de la familia de diferentes [origenes]...me gusto ver la mamá que hablaba el español con el niño* [When I watched the video of the family from different backgrounds...I liked seeing that the mom was talking in Spanish with the child]." Several participants also appreciated the child's language level. One SLP said, "...a lot of the families are like, you know, comparing a lot of their kids to other kids who are early talkers...I like that it showed that realistic what a little two-year-old really talks like." SLPs also liked that videos showed the child might not get it "right" at first.

Comfort Participating in VALI Procedures

Participants commented on caregivers' comfort with each aspect of VALI, including using Spanish, using specific strategies within everyday routines, and participating in asynchronous interactions. All SLPs and researchers valued the idea of encouraging caregivers to use Spanish, and many praised the intervention for highlighting sociolinguistic pride. One SLP relayed the importance of this messaging for preschoolers with disabilities, saying that,

"By the time they get to kindergarten, they're only speaking English because they've had two years of very strategic interventions in English only without parent involvement, and it's the saddest thing when your child has a disability and then he can't communicate with you in your home language."

Several caregivers also shared the value of teaching their children to speak Spanish while also recounting experiences with societal pressure to use English. One mother reported being asked about her use of Spanish while at a movie theater. She told the inquirer, "*es que le tengo que enseñar a las futuras generaciones de mi familia que venimos de hablar español* [it's that I have to teach the future generations of my family that we come from speaking Spanish (we have Spanish-speaking roots)]." Despite expressing pride in her family's linguistic history, she still felt that her family didn't belong, "...*en un cine o sea que hay muchísima gente hablando inglés* [in a theater where many people are speaking English]." Another mother admitted to using English with her child so they could learn together, even though professionals tell her it's good to keep using Spanish. She also said that her spouse, "...*sabe hablar bien el inglés, y él dice [que nuestro hijo] no tiene que aprender [inglés]. Primero en español, que el inglés se lo van a enseñar en la escuela* [knows how to speak English well, and says that our son doesn't need to learn [English]. First Spanish, since they'll teach him English at school]."

Caregivers and researchers *strongly agreed* that caregivers would feel comfortable using the strategies at similar levels (see Figure 4), whereas only one SLP *strongly agreed* (none *disagreed*). An SLP summarized this dichotomy by saying,

“These [the strategies] are things that I tell the parents all the time, and it’s definitely like it’s a very white thing and it’s like very different from how we, like Latino parents, raise our kids, um, but I still have seen [Latino] parents doing it [the strategies] as well.”

Specific comments about cultural dynamics came from researchers who recounted what other parents (outside of this study) had shared about individual strategies. They suggested *show it before you give it* may be perceived as, “...dangerous to keep things away from children. [Caregivers] felt that children would attempt to search for the object later without adult supervision...” Another researcher said parents had concerns about *providing choices*, stating, “they would say, ‘but what if they choose something I don’t want them to choose,’ you know, so they definitely want that control of what their child chooses...” One caregiver liked how the visual for *take turns* made her think about waiting, because “...a veces para nosotros, esperar puede ser un poco más difícil [..sometimes for us, waiting can be a little more difficult].” Overall, participants appreciated the focus on embedding interventions within routines beyond play, as this aligned with an interdependent caregiving approach.

Researchers and SLPs were less confident that caregivers would feel comfortable recording videos of themselves due to privacy concerns. All caregivers reported feeling comfortable recording and sending videos of themselves; however, when asked to expand, one caregiver stated, “...puede ser muy incómodo a veces para las familias como decir o voy a estar live o, you know, grabando [it can be really uncomfortable sometimes for families to say they are going live or, you know, are recording]. Still, caregivers saw the benefits of recording, saying, “...creo que el video sería una parte igual[mente útil] el recordarme que él ha ido cambiando [I think the video would be an equal[ly helpful] part to remind me that he has been changing.”

Many comments on acceptability were related to VALI’s coaching component. SLPs and researchers mentioned potential challenges with a primarily asynchronous intervention due to the value of *personalismo*, or relationship building. Participants generally appreciated the idea of empowering families to support their child’s communication development. One researcher, however, emphasized

the need to explain this to families, saying, “...not all Latinos, but culturally it’s more of the job of the teacher and professionals to help kids learn..., and it’s the parents’ role to be more of the caretaker and the behavior...manager.” She stated that, “...transferring that power dynamic from *la maestra* [the teacher] this idea of ‘we respect teachers and professionals as experts,’ to, ‘you’re actually an expert in your child’s life, and you can teach them,’ that’s a big cultural dynamic shift...” When asked about the characteristics of an ideal coach, one caregiver responded that a coach would have a dual role—know how to interact with their child and be able to provide feedback to the caregiver. Most caregivers emphasized that a Spanish-speaking coach was more important than a coach with Latino heritage. One caregiver said, “*que hablen español es todo* [that they speak Spanish is all (that is important)].” Others caregivers agreed by explaining the importance of having a, “...*conexión a su idioma y puede como hacer un vínculo*... [a connection to your language can form a bond].” One caregiver, however, shared their preference to, “...*escuchar de alguien que se pueda mirar latino or tenga alguna conexión con la comunidad, no me importa mucho de que país sea, pero [alguien] que tenga el conocimiento* [listen to someone who appears Latino or has some connection to the community, I don’t really care about what country they are from, but just that they have that connection].” They also shared that, “a veces, sí influye mucho que sea como hispanohablante como natural [sometimes, it does make a difference if they are like a native Spanish-speaker].”

Language Use

The remaining comments about VALI acceptability were related to the language used in intervention materials. Generally, translations were received positively. In all cases, except *take turns* where participants preferred *tome turnos* over *toma de turnos*, participants ranked the suggested translations as being the most appropriate. One researcher suggested expanding the name for *give small portions* so that it applied, “...to activities or other abstract concepts that are not objects where a “portion”...[is] not measurable.” An SLP provided example language (“*poco en poco* [little by little]”) she uses when explaining this strategy with families. When asked to rank the term for the coach used within VALI, most participants selected the word *guía*.

Most other comments about the language used in VALI materials were constructive (78.9%). Participants pointed out syntax errors or semantic preferences, including comments about words that may be unfamiliar or inappropriate. One SLP said, “*artículos* [objects] is very formal,” and another pointed out that, “*Deslizar* [to slide] may be unknown/uncommon in certain Spanish dialects.”

Sometimes, participant suggestions were contradicted. For example, a native Spanish-speaking researcher was unfamiliar with the word *cotidiana* [everyday], and an SLP stated *diario* [daily] was used more frequently. During focus groups, however, a caregiver independently used *cotidiana* when describing the use of VALI strategies in routines. One researcher identified an error with an accent saying, "...so like the little accent on *bús* is this way [and] should be this way. I just, I feel annoying, but it just makes [it] a little bit of a difference." The same researcher pointed out missing double question marks in the icons on Spanish materials. Finally, some SLPs and researchers noted that materials use *usted* and *tú* conjugations interchangeably. An SLP stated, "...that is incorrect and makes the text difficult to read."

Usefulness

Researchers and SLPs agreed that caregivers' use of VALI would help their child's talking. Caregivers concurred but were the least likely to *strongly agree* (see Figure 4). Open-ended comments about VALI usefulness most often discussed caregiver behavior change as a primary outcome. Several participants also made connections to secondary outcomes to improve child communication. Other comments were related to using the heritage language.

Caregiver Outcomes

Several caregivers made specific comments about the utility of individual strategies. One caregiver realized that by using *repeat and add* she could give her daughter "*el empuje que necesita para que siga formando más palabras* [the push she needs to keep forming more words]." Another described how she started paying more attention to her son's communication by observing and responding to his pointing. She also started giving him, "...*opciones y cuando él me señala ya le digo, es una naranja, está dulce*. [options and when he points to something I say, 'it's an orange, it's sweet.]" Another mother noted the connection between changes in caregiver behavior and child outcomes. She thanked the research team by including a smile emoji and writing that VALI, "*Es una herramienta que me ayuda a motivar a mi hijo hablar, gracias* [is a tool that helps me motivate my child to talk, thanks]."

Participants also commented on the usefulness of the coaching aspect of VALI and thought that sharing videos, receiving feedback, and planning would be helpful in increasing caregivers' use of VALI strategies. One caregiver said they don't always realize what they are doing in interactions with their child, "...*a veces cometemos el error y es mejor mirarlo en un video* [sometimes we make mistakes and it's better to see them in video]." Other participants agreed and commented on the potential positive

impact of feedback on caregivers' use of the strategies. One specific SLP suggestion aligned with the proposed VALI coaching. She stated that caregivers may be too critical of themselves, and feedback should, "...start with something positive, even if the strategy is not there...then sort of bring in, 'here's an opportunity where you could have'..., it'll be easier for that caregiver to digest."

Heritage Language Use

All participant groups shared positive comments about encouraging caregivers to use their heritage language(s). One researcher stated, "I think that the promotion of sociolinguistic pride is [a] really, really important component in helping parents to be advocates for...dispell[ing] some of the myths surrounding bilingualism..." Caregivers said things like, "*Me gustan mucho los mensajes de positivismo y la importancia de ser bilingüe* [I like the positive messages and the importance of being bilingual]," and all clearly valued raising their children to speak Spanish. Caregivers shared questions and uncertainty about raising their children to be bilingual, and recognized that, "...*no temenos por qué avergonzarnos* [we don't have anything to be ashamed of]." One caregiver suggested that family values and the way caregivers may feel about leaving their home country can impact what language they use with their children. She shared that people she knew from high school "*lo usan todas las palabras posibles en inglés. 'Ponte la jacket, the boots,...the TV'* [use as many English words as possible. 'Put on your jacket, the boots...the TV]." SLPs shared strategies for coaching around the use of Spanish, suggesting that, "...coaching feedback to just always mean first bilingualism, you know, something like, 'I really liked the way that you spoke to your child in Spanish even though the child said it in English.'"

Discussion

This study expands the research on caregiver coaching NLI for Spanish-speaking Latinos by gathering perspectives on VALI Version A from caregivers, SLPs, and researchers. Results of analyses from survey and focus group data align with previous research on NLIs adapted for Spanish-speaking Latinos (e.g., Cycyk et al., 2021; Peredo et al., 2017) and suggest primarily positive perceptions of VALI with consideration for its intended users. This study contributes to knowledge on participants' accessibility of VALI as a technology-based caregiver coaching intervention with asynchronous procedures and digital materials. It also builds on earlier research by sharing perspectives on caregiver-implemented NLIs from multiple groups. In alignment with cultural adaptation models (e.g., Domenech Rodríguez et al., 2011), results will be used to inform future iterations of VALI for

additional feasibility and efficacy testing with Spanish-speaking Latino populations and ongoing de-centering of language interventions initially designed with white, English speakers in mind.

Support for VALI Content

When developing and gathering feedback on VALI, the research team considered the historical roots of NLIs as designed for White, English-speaking families. VALI incorporates messaging to counter deficit views around Spanish language use by Latinos and encourage caregivers to use Spanish in everyday activities and routines. Participants in this study were supportive of messaging around sociolinguistic pride and multiple comments showed a need for this component of the intervention (e.g., even caregivers who knew speaking Spanish was beneficial and were proud to have Spanish as a heritage language shared experiences that questioned their use of Spanish or prompted them to use nonnative English). Most feedback on VALI NLI strategies was also positive, and some caregivers even reported integrating strategies into their day-to-day interactions after an introduction to VALI materials. Participants acknowledged the importance of caregivers embedding NLIs in routines other than play and appreciated examples including a father (and not only mothers) as well as a child with realistic language abilities. Requests for additional examples in routines outside the home setting, with other caregivers (i.e., grandparents, siblings), and some clarifications around iconic representations of strategies will be added to future iterations of the intervention.

A few results in this study highlighted areas of potential confusion with VALI strategies and coaching. Future versions of VALI will include more detailed explanations of the intervention purpose to focus on changing caregiver behavior without requiring specific child responses. Similarly, clarification may be needed on the role of the SLP as a caregiver coach rather than as a therapist working primarily with the child. Some participants in this study also suggested more explanation may be needed to help families understand the critical role they can play as language teachers for their child. This cultural shift was not necessarily seen as a barrier to implementing VALI, but rather an opportunity to increase caregiver competence and confidence in supporting their child's language learning.

Challenges and Opportunities With a Technology-Based Intervention

VALI procedures include the use of multiple forms of technology to receive messages encouraging caregivers' use of Spanish in everyday activities, view NLI strategy descriptions and examples, and participate in caregiver

coaching. Caregivers were more confident than other participants in their ability to access and use technology required for VALI. They also represented the only participant group to record and submit sample videos as part of this study. SLPs and researchers had more difficulty using Flip, and some shared their dislike of the video-recording app. Although some caregivers preferred to use synchronous communication (e.g., phone calls), view strategies in hard copy format, and included comments about their own discomfort and logistical challenges related to recording, other caregivers specifically mentioned a desire to receive feedback on their use of NLIs and were interested in having videos of their child to document changes in their child's communication abilities. Given some of the caregivers' specific interest in using videos within asynchronous coaching, additional training may be needed to provide support to SLPs who are less comfortable using this technology.

Future feasibility testing will help untangle whether technology gets in the way of VALI intervention implementation, but we hypothesize that the benefits may outweigh any potential challenges for the following reasons. First, using technological platforms connects Spanish-speaking Latino families to bilingual SLPs whom they may otherwise not have access to. Furthermore, EI programs might be able to maximize limited resources by having a centrally based bilingual SLP providing individualized coaching feedback to multiple families—saving time and other resources currently dedicated to travel. Second, an asynchronous intervention provides flexibility in intervention setting, allowing caregivers to choose a convenient time to learn about, practice, and receive feedback on their use of NLIs without considering transportation or childcare that may be needed with in-person interventions outside of the home. Aligning intervention delivery with caregiver scheduling needs may increase involvement in the intervention overall (Cycyk et al., 2020). Last, given that multiple caregivers may be involved in raising young Latino children (Cycyk & Huerta, 2020; Sarkisian et al., 2007), an asynchronous delivery format provides opportunities for each caregiver to access a consistent set of intervention materials and receive feedback on their use of the strategies. That said, if VALI is eventually used as a billable service, providers would need to determine how the asynchronous model aligns with state policies around telepractice.

Considerations Across Participant Groups

Gathering data from multiple participant groups provided interesting and potentially important information to consider for future iterations of VALI and in other work aimed at understanding caregiver perspectives on the feasibility, acceptability, and usefulness of a given intervention. Between-group comparisons on *strongly agree* data

(see Figure 4) show shifts between caregivers being the most likely group to provide high ratings of VALI feasibility and the least likely to *strongly agree* with the usefulness of VALI. Most researchers applied the highest ratings to VALI usefulness. Practitioners' highest level of agreement also shifted from relatively low levels for VALI feasibility and acceptability, but they came closer to researchers in their ratings of VALI usefulness. These data suggest different understanding and experience among participant groups. Researchers may be more likely to understand the inner workings of NLI, which include complex interactions between antecedents and consequences. SLPs have likely seen the benefits of these interventions in their work with multiple families (despite recognizing that the approaches are not always culturally or linguistically responsive). Thus, both groups were more confident that VALI may produce the intended outcomes. Researchers, however, may have more challenges distilling complex interventions and explaining their utility to caregivers, accounting for lower levels of caregiver agreement on VALI usefulness due to a lack of information on how the interventions work. As suggested by Wing et al. (2007), future iterations of VALI will continue to clarify the connection between using NLIs to more immediate child communication outcomes and later pre-academic and academic outcomes as well.

It is also interesting to consider the proportion of positive comments relayed by the various participant groups within this study given the differences between caregivers (who provided the largest proportion of positive comments) and other participant groups. There are several reasons why caregiver comments about VALI may be more positive, including the possibility that caregivers were truly more supportive of VALI's feasibility, acceptability, and usefulness as compared to SLPs and researchers. However, power dynamics between the research team and participating caregivers may have also played a role and potentially prevented some participants from sharing honest opinions (Larson, An, et al., 2020). The traditional Latino value of *simpatía* (Triandis et al., 1984) may have also impacted caregiver participants' use of positive comments or coders' interpretation of comments as being positive, though presumably, these impacts would have similar possible effects on comments from Latino researcher and SLP participants. Continued triangulation of results within and across various groups will be useful for judging the authentic opinions of all participants in future studies.

Limitations

There are several important considerations to keep in mind with the interpretation of these results. Most importantly, the feedback on VALI shared in this report comes from a relatively small number of participants

whose opinions cannot reasonably be assumed to be shared by the diverse population of Spanish-speaking Latinos in the United States. We therefore emphasize that generalization should not be assumed and, instead, recommend that the processes for intervention adaptation and continuous development (e.g., Domenech Rodríguez & Wieling, 2004) should continue to be used to gather and interpret perspectives of future iterations of VALI, other similar interventions, and in practice using coach-supported NLIs with specific communities and individual families. The possibilities for bias in this sample and within results interpretation should also be considered. First, it is important to remember that caregiver participants in this study were already considering or receiving Part C services due to concerns with their child's communication development. This group would likely have different opinions about VALI as compared to caregivers who may choose not to seek services for communication in the early years (Méndez Pérez, 2000) or choose not to participate in caregiver-coaching interventions due to differing views on the role of parents as teachers of early language skills (Cycyk & Hammer, 2020). Participants' willingness to participate in a study using technology may have also impacted their thoughts on a technology-based intervention. Although participants were provided with the necessary technology for accessing VALI (when needed) as part of this study, any other caregivers, SLPs, or researchers who were not interested in, or were opposed to, using app- or video-based interventions are not likely to have sought participation in this study. Their opinions, therefore, are unrepresented. Finally, the purpose of this study was to gather perspectives on the feasibility, acceptability, and usefulness of VALI, and no experimental data are available to judge the effectiveness of the intervention.

Implications for Research and Practice

The iterative process described to develop VALI Version A considers Spanish-speaking Latino caregivers and the SLPs who might serve them. Next steps in the development of VALI include evaluating the feasibility of the intervention in a field study and following Domenech Rodríguez and Wieling's (2004) suggestions to make changes for the next iteration of the intervention (Version B) through triangulation of the results presented here and future data gathered on caregivers' implementation of VALI. Additional controlled experimental studies will help to determine the effects of VALI on caregivers' use of NLIs along with any measurable change in child language skills. In each of these studies, additional measures will be used at multiple timepoints to allow for further feedback of VALI procedures and content. This information will lead to subsequent adaptations and development of the intervention and provide additional information to the field on the feasibility, acceptability, and usefulness

of coach-supported NLIs for Spanish-speaking Latino families.

Gathering diverse perspectives benefits research by increasing understanding of the function of interventions under particular circumstances and has the potential to improve the delivery of culturally relevant services by SLPs (Horton & Munoz, 2021). This and other recent studies (e.g., Cycyk et al., 2020; Peredo et al., 2017, 2022) provide some insight on the use of NLIs with Spanish-speaking Latino caregivers, but these coach-supported, caregiver-implemented interventions have not been evaluated by other cultural and linguistic groups who are receiving services for communication delays prior to a child's third birthday. The procedures outlined in this study should be considered in future research with other populations and may be modified for application in practice with families from a variety of cultural and linguistic backgrounds. When interventions are socially valid, they may be more likely to be used (Wolf, 1978). Research and practice around the use of coach-supported and caregiver-implemented NLIs should continue working to improve intervention acceptability, particularly for children and families who speak heritage languages. With more appropriate and acceptable interventions, caregivers' use of NLIs should increase, and in turn, child language skills (including bilingualism) for children with or at-risk for language delays will be supported.

Data Availability Statement

All data obtained and/or analyzed are available from the authors upon reasonable request.

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