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Enhancing Early Relational Health and Child Development through Shared Reading in Brazil with Evidence-Based Video-Feedback

Fortalecendo a Saúde Relacional na Primeira Infância e o Desenvolvimento Infantil no Brasil por Meio da Leitura Compartilhada com Vídeo-Feedback Baseado em Evidências

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“Everything in the world began with a yes. One molecule said yes to another molecule and life was born. But before prehistory there was the prehistory of prehistory and there was the never and there was the yes.
There has always been.”

“Tudo no mundo começou com um sim. Uma molécula disse sim a outra molécula e nasceu a vida. Mas antes da pré-história havia a pré-história da pré-história e havia o nunca e havia o sim. Sempre houve.”
— Clarice Lispector

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Content

General Abstract

Decades of research have documented how poverty is associated with disparities in early childhood development that translate to long-term inequities in educational outcomes, physical growth, emotional well-being, and overall thriving across the lifespan. A large body of research has shown that interventions supporting early relational health—defined as nurturing, responsive, and emotionally supportive caregiver-child relationships—provide a strong foundation for supporting optimal development across cognitive, social, and emotional domains and can effectively reduce these early disparities. Video-feedback, including guided shared reading and play interactions, has been identified as a particularly effective strategy for supporting early relational health. Despite established evidence of both short- and long-term positive outcomes, critical gaps remain. These gaps relate to (1) delivery of these strategies through remote systems; (2) utilization of these approaches outside the United States, particularly in Brazil; and (3) comprehensive implementation across key environments for early childhood experiences, including both family homes and educational settings. Therefore, the overarching aim of this research is to adapt evidence-based video-feedback strategies with demonstrated efficacy abroad in the Brazilian context, addressing both home and school environments, while assessing the efficacy and feasibility of remote interventions to promote early relational health through play and dialogic reading in vulnerable populations. This dissertation adheres to a journal-ready format and consists of a collection of scientific articles comprising four manuscripts, each contributing to the overarching objective. Manuscript 1, titled “Effects of Remote Parental Interventions on Shared Reading Practices: A Systematic Review,” provides an analysis of studies employing remote parental training to encourage shared family reading, and examines its impact on child development and family interactions. Manuscript 2, “Remote Brazilian Educational Child Care

Based Adaptation of PlayReadVIP to Support Early Relational Health" introduces the PlayReadVIP model, documents its adaptation to the Brazilian context, presents preliminary findings on feasibility, including acceptability and participant engagement. Subsequent manuscripts expand on these foundational studies. Manuscript 3, "Enhancing Parent-Child Interactions and Child Development in Brazilian Educational Settings: Pre-Post Impact of Adapted PlayReadVIP," explores the program's effects on parenting measures and child outcomes, contributing to the evidence for its efficacy. Manuscript 4, "From Primary Care to Classrooms: A Pilot Study of PlayReadVIP with Brazilian Preschool Teachers," details the adaptation process for teachers and evaluates the program's impact on educational practices and teacher outcomes. Collectively, these manuscripts provide a detailed account of the intervention content, curriculum adaptations, and measured effects on both parenting and teaching contexts. This dissertation concludes with reflections on the implications of these findings for parenting programs, responsive parenting and teaching practices, dialogic reading interventions, public policies, and child development in low- and middle-income countries (LMIC). In particular, we discuss the potential for remote delivery to support universal access to evidence-based strategies, thereby promoting early relational health and child development.

Keywords: Early Relational Health; Child Development; Shared Reading; Video-Feedback; Brazil.

Resumo Geral

Décadas de investigação têm documentado como a pobreza está associada a disparidades no desenvolvimento na primeira infância que se traduzem em desigualdades a longo prazo no desempenho educacional, crescimento físico, bem-estar emocional e prosperidade geral ao longo da vida. Diversas investigações têm revelado que as intervenções que apoiam a saúde relacional na primeira infância—definida como relações entre cuidador e criança que são afetuosas, responsivas e emocionalmente apoiadoras, formando a fundação para propiciar desenvolvimento ideal nas áreas cognitiva, social e emocional—podem reduzir eficazmente estas disparidades precoces. O vídeo-feedback, incluindo aquele feito a partir de leitura compartilhada e interações em brincadeiras, foi identificado como uma estratégia particularmente eficaz para apoiar a saúde relacional na primeira infância. Apesar das evidências estabelecidas por resultados positivos a curto e a longo prazo, subsistem lacunas importantes. Essas lacunas estão relacionadas com (1) a entrega dessas estratégias através de sistemas remotos; (2) a utilização dessas abordagens fora dos Estados Unidos, particularmente no Brasil; e (3) a implementação ampla em ambientes-chave para experiências na primeira infância, incluindo tanto casas de família como ambientes educacionais. O objetivo geral desta pesquisa é adaptar estratégias baseadas em evidências com eficácia demonstrada no exterior para o contexto brasileiro, abordando tanto o ambiente doméstico quanto o escolar, enquanto se avalia a eficácia e a viabilidade de intervenções remotas para promover a saúde relacional na primeira infância através do brincar e da leitura dialógica em populações vulneráveis. Esta tese segue um formato pronto para publicação e consiste em uma coleção de artigos científicos composta por quatro manuscritos, cada um contribuindo para o objetivo geral. O artigo 1, intitulado “Efeitos das intervenções parentais remotas nas práticas de leitura compartilhada: Uma Revisão Sistemática”, fornece a análise de estudos que empregam

treinamento parental remoto para incentivar a leitura compartilhada em família e examina seus impactos no desenvolvimento infantil e nas interações familiares. O manuscrito 2, “Adaptação do PlayReadVIP em Entrega Remota para Educação Infantil e Creches Brasileiras para Apoiar a Saúde Relacional na Primeira Infância” introduz o modelo PlayReadVIP, documenta a sua adaptação ao contexto brasileiro e apresenta resultados preliminares sobre a viabilidade, incluindo a aceitabilidade e o envolvimento dos participantes. Os manuscritos subsequentes expandem esses estudos fundamentais. O manuscrito 3, “Aprimorando as Interações entre Pais e Filhos e o Desenvolvimento Infantil em Ambientes Educacionais Brasileiros: Impacto Pré-Pós da Adaptação do PlayReadVIP,” explora os efeitos do programa sobre as medidas parentais e os resultados das crianças, contribuindo para a evidência de sua eficácia. Manuscrito 4, “Dos Cuidados Primários às Salas de Aula: Um Estudo Piloto do PlayReadVIP com Professoras de Pré-Escolas Brasileiras”, detalha o processo de adaptação para professores e avalia o impacto do programa nas práticas educacionais e nos resultados das professoras. Coletivamente, esses manuscritos fornecem uma descrição detalhada do conteúdo da intervenção, das adaptações curriculares e dos efeitos medidos nos pais e nos contextos educacionais. Esta tese conclui com reflexões sobre as implicações destas descobertas para os programas parentais, práticas parentais e de ensino responsivas, intervenções com leitura dialógica, políticas públicas e para o desenvolvimento infantil em países de baixa e média renda (LMIC), como o Brasil. Estas reflexões destacam o potencial de estratégias escaláveis e acessíveis para abordar as disparidades relacionadas à pobreza e promover a saúde relacional precoce através de abordagens baseadas em evidências.

Palavras-chave: Saúde Relacional Precoce; Desenvolvimento Infantil; Leitura Compartilhada; Vídeo-feedback; Brasil.

Presentation

Early childhood experiences shape the foundation for lifelong development, influencing cognitive, socio-emotional, and health outcomes (Frosch et al., 2021). In Brazil, where socioeconomic disparities impact access to quality early childhood education (United Nations Children's Fund [UNICEF], 2023), the role of early relational health (ERH) and parental interventions becomes even more critical. Evidence-based programs demonstrate that structured interventions can enhance parent-child interactions, mitigating the effects of adversity and fostering resilience (Alarcão et al., 2021; Mendelsohn et al., 2020; Weisleder et al., 2018). However, challenges persist in ensuring equitable access to these programs, particularly in low-income communities, where barriers, such as limited resources and systemic inequalities, hinder implementation.

In this introduction, I provide an overview of my trajectory to contextualize the social and scientific relevance of this research. By outlining the key experiences that have shaped my understanding of early childhood development and intervention strategies, I aim to demonstrate how this dissertation has emerged as a natural progression of my work and responds to critical gaps in the promotion of responsive relationships and ERH in Brazilian families.

My academic and professional journey in early childhood development began immediately after completing my BSc in Psychology, followed by my master's degree in Learning and Developmental Psychology. In the year I began my master's degree, Brazilian education was undergoing a promising and challenging transformation: the inclusion of 6-year-old children in basic education, the so-called 9-year Elementary Education Law (Brasil, 2006). There were legitimate concerns in the country about the transition from early childhood education to elementary education, to guarantee the integration and continuity of learning processes. Through ethnographic studies and observational research, diving into the daily life of an early childhood

education classroom, I developed a strong foundation for analyzing interactions as a tool for understanding and promoting child development. These early academic experiences shaped my career as a developmental psychologist, where I studied the complex dynamics among children, parents, and educators in institutional settings. Concurrently, as a lecturer in educational psychology, I gained insights into the challenges faced by teachers and childcare professionals in their daily practice.

In 2009, I assumed a position at the Alfa e Beto Institute, a leading evidence-based educational non-governmental organization in Brazil, and the following year, I completed my master's degree. Over the subsequent decade, serving as a manager, researcher, and consultant, I developed, tested, and implemented innovative approaches to early and primary education. Notable achievements include the translation and large-scale implementation of The Classroom Assessment Scoring System (CLASS) and The Individualized Classroom Assessment Scoring System (inCLASS), establishing standardized methods for assessing children's interactions with teachers, peers, and tasks (Downer et al., 2010; Pianta et al., 2008).

During this period, a significant project was the evaluation of SESI's preschool program, a national network of 28 non-profit institutions. The Ages & Stages Questionnaires (ASQ-3) and international benchmarks, such as the Infant/Toddler Environment Rating Scale (ITERS-R) and the Early Childhood Environment Rating Scale (ECERS-R) were used (Harms et al., 2005; 2006). This study spanned three Brazilian states, Amazonas, Mato Grosso, and Santa Catarina, involving 78 classrooms and 3,678 children.

Another crucial intervention was the adaptation of PlayReadVIP (Cates et. al., 2016; Mendelsohn et al., 2018) and Reach Out and Read (Guevara et al., 2020) methodologies implemented in Boa Vista, one of Brazil's poorest capitals. We conducted a large-scale cluster

randomized trial involving over 500 parent-child dyads demonstrated the transformative power of family reading, particularly in vulnerable contexts, the intervention, called "Universidade do Bebê" resulted in significant improvements in cognitive stimulation, reading interactions, and reductions in physical punishment, benefiting both indigenous and economically disadvantaged families in Brazilian child care centers (Weisleder et al., 2018). The results were positive, regardless of the literacy levels of the families (Mendelsohn et al., 2020).

My international work expanded through collaboration with UNICEF and the Aga Khan Foundation in 2013, training communities in Pemba, Mozambique, using the Care for Child Development (CCD) methodology (World Health Organization [WHO] and UNICEF, 2022). This experience informed my subsequent contribution to developing a national protocol for Brazil's Criança Feliz Program in 2016, which has since conducted over 16 million home visits, supporting 1.5 million children, 382,912 pregnant women, and 1,262,135 families across 3,020 municipalities (Brasil, 2016; 2018; 2022).

A transformative period in both my personal and professional life began in 2016, when my husband and I adopted two siblings—a nine-year-old girl and a two-year-old boy—followed shortly by the birth of our daughter. Within ten months, I became the mother of three children from different backgrounds and developmental stages. Like many women, I initially feared that this would derail my professional aspirations. The loss of my job following maternity leave—a common experience for mothers—led to a period of freelance work without stability. However, this experience, while interrupting my professional trajectory, provided deep meaning for my previous interventions and shaped my future career direction.

From this period, I maintained my professional engagement by consulting organizations such as the Pan American Health Organization (PAHO), developing training materials for early

childhood interventions, writing children's books, and establishing a private practice as a clinical psychologist, primarily serving mothers. This work with mothers allowed me to witness firsthand how my personal experiences could inform and enhance my professional practice, creating a unique bridge between academic knowledge and lived experience.

At the onset of the COVID-19 pandemic, I was invited to participate in large-scale programs to support vulnerable families in Brazil. This period reaffirmed my commitment to pursuing my PhD and exploring innovative and scalable strategies for early childhood interventions. Between 2020 and 2021, I was involved in the development of Alfa e Beto na TV, an educational television program designed to mitigate learning losses caused by school closures. I recorded 400 episodes of “Brincando com as Palavras” (Playing with Words), focusing on dialogic reading techniques for preschool children. The program has been broadcast nationally on open television since 2021 and remains available online (Alfa e Beto, 2021).

In 2021, I implemented the “Love, Care, and Learning” program in southern Brazil, providing remote teacher training and family support materials to approximately 25,000 families and 1,200 teachers, promoting socioemotional development and responsive interactions. Also, I enrolled in the PhD program at the University of Brasília’s Institute of Psychology under the supervision of Professor Dr. Eileen Pfeiffer-Flores. Initially, I struggled to reconcile academia with motherhood. However, with support both at home and in my research group, I gradually came to recognize how my personal experiences enriched my understanding of parent-child interactions and reinforced my commitment to accessible, evidence-based interventions.

In 2022 and 2023, I collaborated with the Edube Institute, a Brazilian think tank bridging scientific research, educational policies, and pedagogical practices. As a consultant, I developed and coordinated the authorship team for “Bases Educação Infantil: Pré-Escola II,” (Foundations

of Early Childhood Education: Pre-K II) an early childhood education program. I also contributed as an author to language and mathematics curricula (Bases Linguagem [Literacy Foundations] and Bases Matemática [Mathematics Foundations]) for first and second grades, designed within an evidence-based framework aligned with Brazil's National Common Curricular Base (BNCC). These educational materials, implemented through the Pacto pela Alfabetização (Commitment to Literacy) initiative, are currently adopted across four Brazilian states, encompassing eight municipalities and 342 schools, impacting approximately 37,000 children. The program incorporates spiral curriculum design and integrated learning methodologies, offering response to intervention (RTI) and differentiated instruction for diverse learning needs in early literacy and numeracy development.

From November 2023 to August 2024, under a CAPES scholarship and Dr. Alan Mendelsohn's mentorship at NYU's Grossman School of Medicine, I contributed to adapting and evaluating the feasibility of remotely delivering PlayReadVIP in Brazil in preschool settings. The research team in São Paulo was supported by the Edube Institute. The potential impact of this study led to an invitation to help adapt the program for and Family Child Care Centers in the Bronx. This work as an Assistant Research Scientist at NYU, alongside the completion of my PhD in Behavioral Sciences at the University of Brasília, represents the convergence of my academic, professional, and personal experiences.

My path over the last 20 years has been deeply intertwined with these confluences, shaping my research trajectory and culminating in this dissertation. From my early studies in developmental psychology to my involvement in large-scale interventions linked to current public policies, I sought to understand how scalable, inclusive, and cost-effective approaches can support early relational health and promote optimal development in vulnerable populations. The

manuscripts that follow build upon this commitment and reflect this integrated perspective by examining theoretical frameworks, intervention methodologies, and empirical findings. This dissertation embodies my commitment to ensuring that all children and families, regardless of their circumstances, must have the opportunity to thrive, a commitment deeply informed by both my professional expertise and my personal journey as a mother.

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General Introduction

This dissertation follows a journal-ready format, presenting a collection of manuscripts structured as scientific articles that collectively explore the implementation and effectiveness of remote interventions promoting early relational health through responsive interactions and shared reading practices. The work specifically focuses on vulnerable populations in low- and middle-income countries, with Brazil as the primary context of study.

The dissertation comprises four distinct manuscripts, each contributing to our understanding of how remote interventions can foster child development and strengthen parenting and caregiving abilities in resource-limited settings. Manuscript 1, "Effects of Remote Parental Interventions on Shared Reading Practices: A Systematic Review," synthesizes existing literature on remote parental training for shared reading, analyzing the documented impacts on child development and family interactions. This review establishes the theoretical and empirical foundation for the subsequent studies.

Manuscript 2, "Remote Brazilian Educational Child Care Based Adaptation of PlayReadVIP to Support Early Relational Health," introduces the PlayReadVIP model and documents its cultural adaptation to the Brazilian context, named BrincarLerVIP em Sala. This manuscript presents preliminary feasibility data, including measures of acceptability and participant engagement, providing crucial insights into the program's viability in a new cultural setting.

Building upon these foundational studies, Manuscript 3, "Enhancing Parent-Child Interactions and Child Development in Brazilian Educational Settings: Pre-Post Impact of Adapted PlayReadVIP," examines the program's effectiveness through a detailed analysis of its impact on parenting measures and child outcomes. Manuscript 4, "From Primary Care to Classrooms: A Pilot Study of PlayReadVIP with Brazilian Preschool Teachers," extends the investigation into

educational settings, documenting both the adaptation process for teachers and the program's impact on educational practices and teacher outcomes.

The dissertation concludes with reflections on the implications of these findings for parenting programs, teaching trainings, responsive caregiving practices, dialogic reading interventions, and child development in low- and middle-income countries. These reflections emphasize the potential for scalable, accessible, and cost-effective strategies to address poverty-related disparities and promote early relational health through evidence-based approaches.

This work contributes to the growing body of research on remote interventions in early childhood development, while specifically addressing the unique challenges and opportunities present in resource-limited settings. Through systematic investigation and rigorous evaluation, this dissertation aims to advance our understanding of how to effectively implement and scale early relational health interventions in contexts where they are most needed.

Manuscript 1 – Effects of Remote Parental Interventions on Shared Reading Practices: A Systematic Review[1]

[1]This manuscript was published in the peer-reviewed Journal of Research in Childhood Education. Citation: Mazzuchelli, D. S. R., Pfeiffer-Flores, E., Ribeiro, H. F., Minussi, L. F. S., Martins, M. P. D., & Mendelsohn, A. L. (2025). Effects of Remote Parental Interventions on Shared Reading Practices: A Systematic Review. Journal of Research in Childhood Education, 1–17. https://doi.org/10.1080/02568543.2025.2503157

Parent-child shared reading interventions have emerged as a critical strategy for enhancing child development and early relational health (ERH) (Weisleder et al., 2018). These interventions focus on promoting reading aloud as a core contributor to positive parent-child interactions and developmental outcomes. Evidence-based programs have demonstrated significant impacts across multiple developmental domains, including language, cognition, and social-emotional skills (Weisleder et al., 2018; Sénéchal & Young, 2008).

Early relational health is defined as the foundational quality of relationships between infants and their caregivers (Willis & Eddy, 2022). This concept is fundamental to improving child development, nurturing early learning opportunities, and reducing poverty-related inequities (Cates et al., 2016a; Roby et al., 2024a; WHO & UNICEF, 2022). Supportive relationships in early childhood are vital, as early experiences significantly influence gene expression and brain development (Shonkoff, 2010). Poverty emerges as a major contributor to social disparities with long-lasting effects (Cates et al., 2016a; Engle & Black, 2008; Sells & Mendelsohn, 2021), underscoring the need for preventive interventions that strengthen parental capacities and foster resilience (Roby et al., 2024b; Gross et al., 2021; Shaw et al., 2021)

Shared reading interventions have been developed across various settings, including pediatric primary care (Cates et al., 2016a; Roby et al., 2024b; Mendelsohn et al., 2001), childcare centers (Weisleder et al., 2018; Dowdall et al., 2019) and home visits (Shaw et al., 2021). Programs like Reach Out and Read (ROR) and PlayReadVIP have demonstrated promise in promoting early literacy, enhancing parenting practices, and supporting child development(Garbe et al., 2023; Jimenez et al., 2024; Mendelsohn et al., 2001; Mendelsohn et al., 2013; Mendelsohn et al., 2020; Piccolo et al., 2022; Shaw et al., 2021;). These interventions not only improve reading duration but also enhance parent-child interactions and provide cognitive stimulation (Dowdall et al., 2019;

Cates et al., 2016b). However, a notable and global health event of this generation with diverse and long-lasting effects on child development and parental relationships was the coronavirus disease (COVID-19). The COVID-19 pandemic, officially declared on March 11, 2020, and closed on May 3, 2023, by the World Health Organization (Sarker et al., 2023), has exacerbated existing disparities, created barriers to accessing traditional in-person support services, increased stress, reduced engagement in supportive parenting practices, and emphasized the need for remote interventions and crisis-related parental training (Araújo et al., 2021; Kimura et al., 2021; Lucassen et al., 2021). Amid evolving circumstances, remote strategies such as video training, text messages, and WhatsApp-based programs present potentially scalable solutions for maintaining effective parental training and caregiving practices as families move forward beyond the pandemic (Smith et al., 2023).

Given the social transformations driven by the COVID-19 pandemic and the context that has exacerbated existing stressors in family dynamics (Solís-Cordero et al., 2022) it has become increasingly necessary for parental interventions to consider diverse delivery methods, not solely in person. Therefore, it is important, even in the post-pandemic world, to recognize that parental interventions could be improved if conducted through remote strategies, or by utilizing them for specific components to enhance parental training. One previous systematic review of ERH interventions examined reading-aloud interventions but did not include remote delivery (Dowdall et al., 2019). Conversely, another review examined remotely delivered parenting interventions but did not specifically address shared reading practices (Solís-Cordero et al., 2022).

To our knowledge, no systematic reviews have explored how parental training for shared reading practices can be delivered remotely and its impact on relational health and child development. The significance of this review is multifaceted. First, the COVID-19 pandemic has

underscored the critical need for adaptable intervention strategies that can reach families despite physical barriers (Araújo et al., 2021; Kimura et al., 2021; Lucassen et al., 2021). Remote delivery methods offer potential solutions for maintaining essential parental support during disruptions to traditional service delivery (Smith et al., 2023).

Moreover, systematic reviews play a crucial role in synthesizing existing research to identify effective interventions, knowledge gaps, and future research directions. By comprehensively examining remotely delivered shared reading interventions, this review can provide insights into: the efficacy of different remote training approaches; potential scalability of interventions across diverse contexts; mechanisms by which remote interventions can support parent-child interactions; comparative effectiveness of various delivery methods.

Shared reading remains a compelling focus due to its demonstrated support for child development across language, cognitive, and social-emotional domains (Dowdall et al., 2019; Cates et al., 2018; Weisleder et al., 2018). This review aims to assess how remotely delivered parental training focused on shared reading practices influences parent-child interaction and child development, offering a timely and important contribution to understanding innovative approaches to early childhood intervention.

Method

The study protocol was registered at International Prospective Register of Systematic Reviews, PROSPERO, on October 2, 2023, registration number CRD42023377187, and followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis, PRISMA guidelines (Moher et al., 2009).

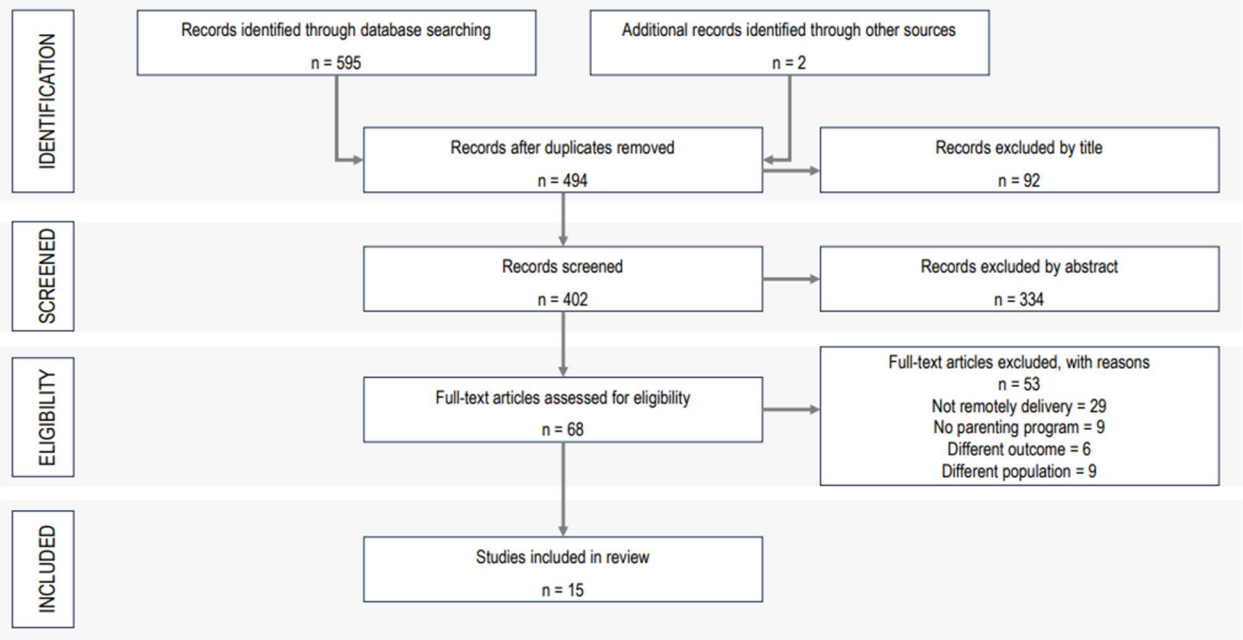
Search Strategy and Study Selection

The search for peer-reviewed articles published in academic journals until February 2024 involved a preliminary search in December 2023 on the Web of Science and Scopus to identify relevant keywords. The refined strategy included databases, such as PubMed, Embase, PsycINFO, and MEDLINE. A comprehensive search strategy related to parental intervention and remote aspects was developed to capture a broad range of literature. Additional terms from known articles were included to ensure identification of relevant articles regardless of specific terminology (see Supplementary Material).

BibTeX files were imported into RStudio, and duplicates were removed using the Bibliometrix package (Aria & Cuccurullo, 2017). Two independent reviewers screened studies by title and abstract based on the inclusion criteria. In cases of disagreement, a third reviewer was consulted. Full-text studies meeting the inclusion criteria were retrieved and evaluated. A PRISMA flow diagram was used to document reasons for excluding full-text studies (see Figure 1).

Figure 1

Prisma Flow Diagram



Eligibility Criteria

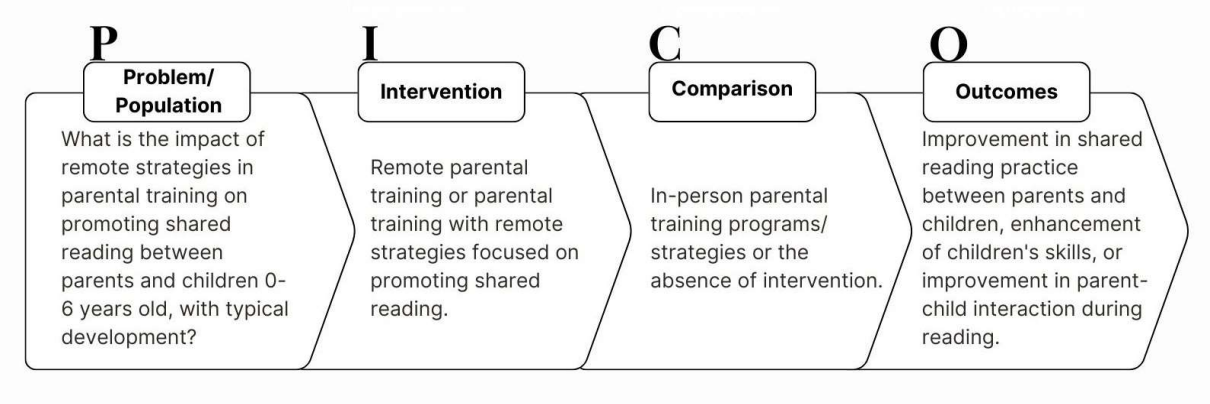
The inclusion criteria were: (i) published in English or Portuguese[2]; (ii) peer-reviewed; (iii) original empirical report; (iv) involving parental intervention; (v) delivered remotely or incorporating remote strategies to promote shared reading; and (vi) involving participants from birth to six years with typical development. We included studies regardless of participants'

[2] The inclusion of Portuguese studies reflects the authors´ expertise in researching shared reading practices in Portuguese-speaking countries, particularly as part of ongoing efforts to contribute to empirical research on remotely delivered interventions in Brazil.

socioeconomic levels for a better understanding of the remote interventions utilized. The inclusion criteria were intentionally broad to encompass various experimental designs and ensure a thorough review of parental interventions. We organized information about the studies using the PICO model, which helps structure research questions by focusing on Population, Intervention, Comparison, and Outcome (McKenzie et al., 2024) as shown by Figure 2.

Figure 2

Pico Strategy



Quality Assessment and Data Extraction

Two independent reviewers conducted data extraction and assessed the risk of bias, with disagreements resolved by a third reviewer. The version two of Cochrane Risk of Bias Tool (Higgins et al., 2023), known as RoB2, was used to evaluate potential sources of bias, categorizing risks as "high," "some concerns," or "low". Five domains were assessed, including bias arising from the randomization process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome; and bias in selection of the reported result. Key study details and intervention information were extracted and are presented in the supplementary material.

Analytic Plan

The findings were confined to descriptions of the statistics and measures used in the included studies. No pooled analyses were conducted because of the inconsistency and variability in the outcome measures that were reported.

Results

Study Selection and Characteristics

As depicted in Fig. 1, the initial database search yielded 595 records. Two additional records were obtained through other sources. After removing 103 duplicate records, 494 titles were screened with 92 being excluded based on the title. The abstract was assessed in 402 articles for eligibility. Of these, 334 were excluded, 68 full-text articles were further evaluated, and 53 were ultimately excluded. The reasons for exclusion were: 25 articles were not remotely delivered; 10 articles did not have a parenting program component; 10 articles had a different outcome focus (not parent-child interactions or child development); 8 articles had a different population (older children or specific diseases, for example). Ultimately, this review included 15 randomized controlled trials (RCTs) with 3,386 parent-child dyads from diverse backgrounds. The locations and socioeconomic characteristics of participants varied across the studies. The majority of studies (nine) focused on low-income families (Abimpaye et al., 2019; Blom-Hoffman et al., 2007; Feil et al., 2020; Guevara et al., 2020; Guevara et al., 2023; Huebner & Meltzoff, 2005; Hutton et al., 2021; Jimenez et al., 2021) with seven conducted in the United States (Blom-Hoffman et al., 2007; Feil et al., 2020; Guevara et al., 2020; Guevara et al., 2023; Huebner & Meltzoff, 2005; Hutton et al., 2021), one in Rwanda (Abimpaye et al., 2019), and another in Zambia and Tanzania (Skeen et al., 2023). These studies primarily involved families from ethnic and racial minorities living at or below the federal poverty line. Six studies examined children from middle-to-upper

socioeconomic status families, including participants from the United States (Adinarayanan et al., 2022; Arnold et al., 1994; Riordan et al., 2021), India (Adinarayanan et al., 2022), China (Chow et al., 2008), and New Zealand (Schaughency et al., 2023). The database includes articles published between 1994 and 2023. Of the 15 articles analyzed systematically, 11 were published in or after 2020. These studies encompassed children with age ranges spanning from zero to six years. The youngest age represented was newborns (Guevara et al., 2020), whereas the oldest was 71 months (Adinarayanan et al., 2022). The mean age across these studies is approximately 30.4 months, with a standard deviation of 20.3 months. Despite comprehensive searches for publications in Portuguese, no studies were found in this language, with all selected studies being published exclusively in English.

Assessments and Measures

Of the 15 reviewed studies, 13 included child development outcomes (Abimpaye et al., 2019; Adinarayanan et al., 2022; Arnold et al., 1994; Blom-Hoffman et al., 2007; Chow et al., 2008; Feil et al., 2020; Guevara et al., 2020; Guevara et al., 2023; Huebner & Meltzoff, 2005; Hutton et al., 2021; Jimenez et al., 2021; Riordan et al., 2021; Schaughency et al., 2023; Skeen et al., 2023; Stuckelman et al., 2022) with only two not including these measures (Blom-Hoffman et al., 2007; Jimenez et al., 2021). Twelve studies examined parent-child interactions (Abimpaye et al., 2019; Adinarayanan et al., 2022; Arnold et al., 1994; Blom-Hoffman et al., 2007; Chow et al., 2008; Feil et al., 2020; Guevara et al., 2020; Guevara et al., 2023; Huebner & Meltzoff, 2005; Hutton et al., 2021; Jimenez et al., 2021) , while three did not (Riordan et al., 2021; Schaughency et al., 2023; Stuckelman et al., 2022). Assessment instruments were diverse. Cognitive stimulation was evaluated using the $StimQ_2$ in three studies (Guevara et al., 2020; Hutton et al., 2021; Jimenez et al., 2021), while receptive vocabulary was assessed through the Peabody Picture Vocabulary

Test in two studies (Arnold et al., 1994; Chow et al., 2008). Six studies employed recorded videos of shared reading sessions to analyze parent-child relationships, focusing on various interaction dimensions such as: verbal prompts (Adinarayanan et al., 2022; Blom-Hoffman et al., 2007); parent-child verbal exchanges (Huebner & Meltzoff, 2005; Riordan et al., 2021); quality of interactions (Chow et al., 2008; Jimenez et al., 2021).

Seven author-developed assessments were used to evaluate child development and/or parent-child interaction (Blom-Hoffman et al., 2007; Chow et al., 2008; Huebner & Meltzoff, 2005; Jimenez et al., 2021; Riordan et al., 2021; Schaughency et al., 2023; Stuckelman et al., 2022). For child development, researchers created specific assessments such as a narrative skills assessment using the Edmonton Narrative Norms Instrument (ENNI) (Adinarayanan et al., 2022), a reading interest and storybook identification tool (Chow et al., 2008), and assessments for coding oral language skills and verbal exchanges (Huebner & Meltzoff, 2005; Riordan et al., 2021). Parent-child interaction assessments were equally innovative, with studies developing detailed coding systems. These included an assessment of verbal prompts across Dialogic Reading strategies (Blom-Hoffman et al., 2007), interaction quality measurements focusing on verbal responsiveness and engagement (Jimenez et al., 2021), an adaptation of the Parent-Child Interaction System (Stuckelman et al., 2022), and assessments coding parent behaviors during reading interactions (Huebner & Meltzoff, 2005). These customized tools reflect the complexity of measuring nuanced aspects of shared reading experiences and child-parent interactions.

Quality Assessment and Risk of Bias

Utilizing the RoB2 tool, none of the studies presented a high risk of bias in any of the five categories. However, the biases due to deviations from the intended intervention presented “some concerns” in almost all studies, with low risk in only two studies (Huebner & Meltzoff, 2005;

Stuckelman et al., 2022). These scores are understandable in the context of educational programs and applied research. Regarding bias in the measurement of the outcome, it is worth noting that in nine studies (Abimpaye et al., 2019; Adinarayanan et al., 2022; Arnold et al., 1994; Blom-Hoffman et al., 2007; Chow et al., 2008; Feil et al., 2020; Guevara et al., 2023; Hutton et al., 2021; Skeen et al., 2023) the outcome assessors were not blinded to the group assignments, which could introduce bias in how outcomes were measured. Another important issue is that one study (Adinarayanan et al., 2022) showed some concerns in four of five risk of bias categories, followed by six other studies (Abimpaye et al., 2019; Arnold et al., 1994; Blom-Hoffman et al., 2007; Chow et al., 2008; Feil et al., 2020; Hutton et al., 2021) that exposed some concerns in three of the five categories. For more details, see the supplemental material.

Table 1

Studies Overview: Sample Characteristics and Assessment Measures

Study Country	*Sample size*	*Families' characteristics*	*Assessments and Relevant Measures*	
			Child development	*Parent-child interaction*
[35] Abimpaye et al. (2019) Rwanda	*1450*	*Children aged 6–24 months, low-income*	*Child development: Ages & Stages Questionnaires (ASQ)*	*Children's physical development and parenting practices: Home Observation Measurement of the Environment Short Forms (HOME-SF)*
[43] Adinarayanan et al. (2022) India	*210*	*Children aged 4–6 years, middle-class parents*	*Narrative skills: Assessment developed by the authors. Edmonton Narrative Norms Instrument (ENNI).*	*The assessment developed by the authors used as criteria the parent's descriptions of pictures, their ability to prompt inferences about the story, and discussions about letters, words, or overall book concepts*
[40] Arnold et al. (1994) United States	*64*	*Children aged 24–34 months, middle-to-upper SES*	*Expressive Vocabulary: Expressive Language Scale of Reynell Developmental Language Scales (EOWPVT); Illinois Test of Psycholinguistic (ITPVA-VE, ITPVA-GC). Receptive Vocabulary: Peabody Picture Vocabulary Tests-Revised (PPVT-R)*	*Not directly assessed*
[38] Blom-Hoffman et al. (2007) United States	*18*	*Children, average age of 41 months*	*Verbalizing behaviors: Records were transcribed and coded. Assessment developed by the authors.*	*The assessment developed by the authors coded eight types of verbal prompts, encompassing seven DR strategies: open-ended prompts, attention-directing statements, evaluations, expansions, repetitions, completions, recall prompts, and prompts connecting the story to the child's experiences.*
[44] Chow et al. (2008) China	*148*	*Children aged 57–71 months*	*Receptive Vocabulary: Cantonese receptive vocabulary test and PPVT-III (Peabody Picture Vocabulary Tests) Morphological Awareness: Two Tasks. Nonverbal IQ: The Raven's Colored Progressive Matrices Reading Interest and Storybook Identification: Assessment developed by the authors.*	*Not directly assessed*
[32] Feil et al. (2020) United States	*159*	*Children aged 3,5-7,5 months, low-income*	*Not directly assessed*	*Mother-infant observed behavior: The Landry Parent–Child Interaction Scales;Maternal Knowledge: PALS Knowledge Questionnaire.*

[31] Guevara et al. (2020) United States	*120*	*Newborns, African American, low-income*	*Expressive and Auditory Language: Preschool Language Scale, Fifth Edition (PLS-5)*	*Cognitive Stimulation at home: StimQ₂* Read Subscale.*
[39] Guevara et al. (2023) United States	*10*	*Children aged 6-24 months old*	*Language Comprehension: MacArthur Communicative Development Inventory (CDI);Socio-emotional Problems: Devereux Early Childhood Assessment (DECA)*	*Home Reading Environment: StimQ₂* Parenting Stress: Parenting Stress Index Form (PSI-SH):*
[37] Huebner and Meltzoff (2005) United States	*125*	*Children aged 2-3 years*	*Children's Vocabulary MacArthur Communicative Development Inventory (CDI)*	*The assessment developed by the authors coded behaviors of parents include verbal expansions, open-ended questions, interactive reading techniques, and actions reducing interaction, such as reading without child inclusion and employing yes/no questions.*
[33] Hutton et al. (2021) United States	*217*	*Children aged 6 or 18 months, low-income*	*Child Behavior: LENA Snapshot*	*Parental Attitudes toward shared reading, family history of reading difficulties: Published Research; Home Reading Environment:StimQ₂*; Shared Reading Quality: SharePR; Screen time: ScreenQ-I/Y Child*
[34] Jimenez et al. (2021) United States	*160*	*Children aged 6-15 months, low-income*	*Risk for developmental delay: Survey of Wellbeing of Children*	*The assessment developed by the authors measured interaction quality, verbal responsiveness, and engagement. Observers emphasized the frequency of prompts, encouragement, and the emotional connection; Home Reading Environment: StimQ₂**
[42] Riordan et al. (2021) United States	*69*	*Children aged 3.5-4.5 years, moderate to high SES*	*Oral Language Skills: Records were transcribed and coded Oral Language skills: Recording Unfamiliar Story Letter Knowledge: Letter Naming Fluency (LNF) Phonological Awareness: First Sound Fluency (FSF)*	*Assessment developed by the authors included the frequency and type of verbal exchanges, the level of engagement demonstrated by both parents and children, and the use of prompts and elaborations during the reading.*
[45] Schaughency et al. (2023) New Zealand	*69*	*Children aged 3.5-4.5 years*	*Literacy Skills (Letter Knowledge,Phonological Awareness,Alphabet knowledge): Dynamic Indicators of Basic Early Literacy Skills; Word Reading: WordIdentification Fluency*	*Not directly assessed*
[36] Skeen et al. (2023) Zambia and Tanzania	*494*	*Children aged 9-32 months, low-income*	*Child language: Caregiver Reported Early Development Instrument; Social and emotional development: Strengths and Difficulties Questionnaire; Aggression Behavior: CBCL aggression subscale.*	*Patient Health; Questionnaire-9(PHQ-9) and Generalized Anxiety Disorder-727 (GAD-7). Parental Stress Scale (PSS)**; Responsive caregiving: Parent-Child Conflict Tactics Scale and Learning Subscales of the Family Care Indicators*

[41] Stuckelman et al. (2022) United States	*73*	*Children aged 3-4 years, high SES*	*Not directly assessed*	*The assessment developed by the authors was an adaptation of the Parent–Child Interaction System (PARCHISY) assesses parent-child behaviors, focusing on positive and negative behaviors, mutuality, and on-task engagement during interactions.*

Studies Overview: Sample Characteristics and Assessment Measures **StimQ₂ - Cognitive Stimulation at home Questionnaire; **Related to parental mental health outcomes.*

Intervention Details

Table 2 provides an overview of the interventions and various remote-delivered strategies that were employed. Although there were a total of 15 studies, there were only 13 unique interventions, given that the intervention Reach Out and Read was studied twice Guevara et al., 2020; Guevara et al., 2023), and the intervention Tender Shoots was used in two other studies (Riordan et al., 2021; Schaughency et al., 2023). The shortest intervention lasted for 15 minutes (Blom-Hoffman et al., 2007), while the longest ones spanned six months (Abimpaye et al., 2019; Jimenez et al., 2021). The mean duration of these interventions was approximately 11.27 weeks, with a standard deviation of 6.97 weeks indicating moderate variability. Among the remote components, text messaging was the most used, featured in six studies (Guevara et al., 2020; Guevara et al., 2023; Hutton et al., 2021; Jimenez et al., 2021; Skeen et al., 2023; Riordan et al., 2021), followed closely by recorded videos, which were used in five studies (Arnold et al., 1994; Blom-Hoffman et al., 2007; Feil et al., 2020; Huebner & Meltzoff, 2005; Jimenez et al., 2021).

Table 2

Parenting Intervention Overview

Study	*Intervention*	*Remote Strategy*	*Duration*	*Intensity*	*Brief Description*
[35] Abimpaye et al., 2019	*First Steps Parenting Education*	*Participatory radio programming*	*17 weeks*	*1.5-hour long once a week*	*The intervention comprised a light touch arm featuring weekly radio sessions, and a full intervention arm enhanced with extra resources, training, and home visits. It emphasized socio-emotional, cognitive, language, and physical development, fostering responsive caregiving and emergent literacy via engaging activities and community participation.*
[43] Adinarayanan et al., 2022	*Shared book reading (SBR) training*	*Online meetings*	*5 weeks*	*45 minutes to 1-hour weekly session*	*Parents received training in SBR online in small groups to enhance interactive storytelling with their children.*
[40] Arnold et al., 1994	*Dialogic Reading*	*Videotaped training*	*4 weeks*	*20 to 30-minutes, weekly session*	*Parental training encouraged mothers to read at least four times weekly. Parents were taught using three methods: explaining shared reading techniques, model demonstration videos, and direct feedback.*
[38] Blom-Hoffman et al., 2007	*Read Together, Talk Together (RTTT)*	*Videotaped training*	*15 minutes*	*15-minute video, one session*	*Parents viewed a 15-minute RTTT dialogic reading training video in CHC waiting rooms, supplemented with a handout summarizing key strategies.*
[44] Chow et al., 2008	*Dialogic Reading (DR) with Morphology Training (MT)*	*Phone calls*	*12 weeks*	*Bi-weekly, resulting in 6 brief calls*	*The remote strategy involved bi-weekly phone calls to parents in the DR and Typical Reading (TR) groups. These calls served to remind parents to read with their children, encourage adherence to the reading schedule, and address any issues or challenges. Parents read twice weekly for 20 minutes, trained to engage interactively.*
[32] Feil et al., 2020	*Play and Learning Strategies program (ePALS)*	*Video and phone calls by internet*	*4 - 6 months*	*Coach call to co-view weekly videos*	*Bilingual (English-Spanish) internet program focused on teaching parenting strategies through video-based learning, practice activities, and coaching calls.*
[31] Guevara et al., 2020	*Reach Out and Read*	*Text messages*	*4 months*	*Weekly*	*Provision of board books and reading promotion at well-child visits for newborns, plus weekly text messages.*
[39] Guevara et al., 2023	*Reach Out and Read*	*Text messages*	*8 weeks*	*Daily*	*Parents were randomized into three groups: daily reminders with tips (Texting), reminders followed by reading queries (Regret), and reminders with daily lottery entries and cash prizes (Lottery).*

[37] Huebner and Meltzoff, 2005	*Parent–child reading intervention*	*Video and with phone calls*	*8 weeks*	*45 minutes to 1 hour two sessions*	*Dialogic reading training for parents to enhance child participation during reading sessions.*
[33] Hutton et al., 2021	*Rx for Success/ ROR*	*Mobile app and push messages*	*6 months*	*Does not detailed*	*RxS is a free mobile app reinforcing constructive parenting practices through two videos "word matter" for age 0-2(talking, singing, reading; time 2:12) and "Dialogic Reading" for age 2-4 (time 1:35) involving question prompts and ways to respond to a child to encourage verbal interaction. Parents receive "push" messages encouraging these at a desired frequency.*
[34] Jimenez et al., 2021	*ROR*	*Video and text messages*	*6 months*	*One 3-minutes and nine text messages per month for six months*	*The intervention consisted of 1) A 3-minute video demonstrating DR, shown during clinic visit; and 2) 9 text messages/month for 6 months, including reminders, motivational messages, and strategies to overcome barriers to reading, with 1 message/month requiring a response.*
[42] Riordan et al., 2021	*Tender Shoots*	*Text messages and phone calls*	*6 weeks*	*Weekly text messages, calls after three weeks*	*Included two components: RRR (Read, Reflect, and Respond), which focused on enhancing vocabulary and story comprehension through interactive discussions about the storyline, and SSS (Shared Storytelling Sessions), which emphasized phonological awareness through sound-related activities.*
[36] Skeen et al., 2023	*Sharing Stories*	*Text message with Whatsapp*	*6 weeks*	*Weekly 1–2-hour group chat sessions*	*A digital program for shared reading and caregiver mental health support, promoting responsive caregiving and child development.*
[41] Stuckelman et al., 2022	*Dialogic reading intervention with Ramone*	*eBooks*	*2 weeks*	*Families were asked to read the eBook 10 times*	*Dialogic reading using eBooks with Ramone, a virtual character used to model questioning to enhance parent-child interactions.*
[45] Schaughency et al., 2023	*Tender Shoots*	*Phone calls*	*6 weeks*	*Does not detailed*	*Tender Shoots is a 6-week parent-mediated program focusing on phonological awareness and shared reading, involving parent education sessions and personalized materials.* *Weekly resources were delivered to children's early childhood centers, and there was also phone contact to support the implementation.*

**EC = Experimental Group; CG = Control Group; DR = Dialogic Reading*

Main Outcomes

Across studies, common outcome trends emerged, particularly in language and cognitive development. Notable improvements were consistently observed in: language skills (Adinarayanan et al., 2022; Arnold et al., 1994; Huebner & Meltzoff, 2005); narrative abilities (Adinarayanan et al., 2022); vocabulary development (Chow et al., 2008); parent engagement during reading (Huebner & Meltzoff, 2005). Parental mental health was directly measured in just one study (Blom-Hoffman et al., 2007). Using a variety of remotely delivered strategies, such as video training and text messages, studies have shown that parental training in reading aloud affects child development and parenting. These findings, although incipient and insufficient to support generalizations, are similar to those already established in the literature on in-person delivery. The studies focused on different dependent variables, showing outcomes in many aspects of child development, such as improvement in children's narrative skills (Huebner & Meltzoff, 2005), higher cognitive stimulation at home though increased shared reading sessions (Hutton et al., 2021), phonological awareness-related skills (Riordan et al., 2021), among other key developmental benchmarks (Adinarayanan et al., 2022).

Concerning parent-child relationships, families receiving remote interventions significantly increased their use of DR strategies, observed at 6 weeks, and sustained at 12 weeks (Blom-Hoffman et al., 2007). In another study, mothers in the experimental group demonstrated significant improvements in parenting knowledge and strategies, leading to enhanced infant language development compared to the control group (Feil et al., 2020). Moreover, compared to the standard ROR program, the enhanced ROR showed slight improvements in the home-literacy environment and parents' reading attitudes (Jimenez et al., 2021).

Interestingly, dialogic eBooks enhanced mutuality, positivity, and appropriate behavior

between parents and children during reading sessions, with significant improvements in interaction quality (Stuckelman et al., 2022). An additional investigation showed that the experimental group also exhibited increased engagement during reading sessions, characterized by longer utterances and more verbose responses (Huebner & Meltzoff, 2005). Notably, regarding caregiver mental health, there was a higher likelihood of engaging in responsive caregiving practices and marked reductions in depression and anxiety symptoms in the experimental group (Skeen et al., 2023). A summary of these findings is presented in Table 3.

Table 3

Main Results

Study	*Main Results*
[35] Abimpaye et al. (2019)	*Children in both EGs significantly outperformed the control group in developmental benchmarks from ASQ. The light touch intervention showed strong positive outcomes, indicating effective scaling potential. Average attendance was 12 out of 17 sessions, and improvements in parenting practices were noted across all groups.*
[43] Adinarayanan et al. (2022)	*SBR training improved children's narrative skills (ENNI scores) significantly in the experimental group ($P < .001$) compared to the control group.*
[40] Arnold et al. (1994)	*Children whose mothers watched training videos had better language skills than those in the control group. Video training proved more effective than traditional methods.*
[38] Blom-Hoffman et al. (2007)	*Parents in the experimental group significantly increased their use of DR strategies, with a large effect size noted at 6-week follow-up (ES = 2.26) and maintained high levels at 12 weeks (ES = 1.36).*
[44] Chow et al. (2008)	*DR improved vocabulary; DR+MT enhanced character recognition and morphological awareness; both increased reading interest.*
[32] Feil et al. (2020)	*Mothers in the ePALS group showed significant gains in parenting knowledge and strategies, leading to improved infant language development compared to the control group.*
[31] Guevara et al. (2020)	*Early literacy promotion led to higher StimQ Read Subscale scores at 6 months but no differences in language development at 24 months.*
[39] Guevara et al. (2023)	*Parents read an average of 4 days per week, with no change in frequency over time. While StimQ scores increased, there were no significant differences in StimQ, PSI-SF, CDI, and DECA scores between groups. Parents in all groups were satisfied with the intervention (3.8/5.0). Observations showed that the technology encouraged more frequent and meaningful interactions during reading.*
[37] Huebner and Meltzoff (2005)	*Significant improvements in children's language and parent engagement during reading sessions. The EG demonstrated a mean verbosity of 29.46 utterances, compared to 17.61 in the CG. The length of the children's longest five utterances increased, with the EG averaging 3.81 words, while the CG averaged 2.79 words. The parent-child interaction improved to a mean of 1.91 in the EG, compared to just 0.23 in the CG.*
[33] Hutton et al. (2021)	*The EC showed significant improvements compared to the CG in terms of shared reading being a favorite activity, more frequent shared reading at 12 months, and higher language scores at 24 months. Screen time was high and equivalent between the two groups, exceeding the recommended guidelines from the*

	AAP.
[34] Jimenez et al. (2021)	*The enhanced ROR led to higher StimQ Reading subscale scores (0.32 SD, p=0.034) and marginally better overall reading attitudes (PRBI, p=0.074). Positive affect (PRBI, p=0.017) and knowledge and resources subscales also improved. There were no significant differences in shared reading frequency, verbal responsivity, or developmental delays. Qualitative interviews revealed parents appreciated the additional support but still faced barriers.*
[42] Riordan et al. (2021)	*RRR increased meaning-focused talk. SSS improved sound- and print-focused talk. Significant benefits for older children's letter recognition and phonological awareness.*
[36] Skeen et al. (2023)	*Caregivers in the EG reported a higher likelihood of engaging in responsive caregiving practices, with an odds ratio of 2.55 (p = 0.02). There were notable reductions in symptoms of depression (β = -0.64, p = 0.05) and anxiety (β = -0.65, p = 0.02) among caregivers. While the intervention led to significant improvements in mental health for caregivers in Zambia, no significant changes were observed in parenting outcomes for this group, whereas caregivers in Tanzania showed significant enhancements in responsive caregiving behaviors.*
[41] Stuckelman et al. (2022)	*Increased parent-child mutuality, positivity, and on-task behaviors during reading; significant improvements in positive interactions after using the dialogic eBook.*
[45] Schaughency et al. (2023)	*SSS participants showed significant improvements in letter sounds (d = .74), pseudoword reading (d = .85), word reading (d = .66), and teacher-judged reading (d = .60) compared to controls*

**EC = Experimental Group; CG = Control Group; DR = Dialogic Reading; AAP = American Academy of Pediatrics.*

Discussion

This systematic review of 15 randomized controlled trials evaluated the effectiveness of various remote components of interventions designed to enhance early childhood development and parenting skills through shared reading. These interventions demonstrated positive impacts on early literacy, parenting practices, and overall child development. The findings align with research on remote parenting interventions in other outcomes, such as socioemotional competence (Reese et al., 2023) and other populations, such as children with developmental disabilities (Pierson et al., 2021), which have shown similar success in improving parent-child interactions and child outcomes through digital platforms and distance learning approaches. Moreover, our results mirror the effectiveness of traditional in-person shared reading interventions (Cates et al., 2016b, Jimenez et al., 2021, Mendelsohn et al., 2018), suggesting that remote components can achieve comparable benefits while potentially reaching broader populations.

The effectiveness of remote shared reading interventions observed in our review parallels findings from broader parenting intervention research, where remote delivery methods have

successfully enhanced parental competencies and child development outcomes. This aligns with technology-mediated interventions being a promise to support sensitive parenting practices when properly designed and implemented. The following discussion expands into three key findings that emerged from our analysis: the feasibility of remote components, their cost-effectiveness, and their complementary role alongside in-person strategies. These findings both complement and extend existing literature on remote parenting interventions, while offering new insights specific to shared reading practices.

Feasibility of remote components

One of the key findings of this review is the feasibility of incorporating remote components into parental interventions mentioned by the studies included. Research has demonstrated that remote components can effectively engage parents and children aged 0 to 6 years. A 15-minute video on dialogic reading significantly increased parents' use of DR strategies and enhanced child verbalizations when viewed in community health centers (Chow et al., 2008). Despite challenges such as videotaping reactivity, small sample sizes, and language barriers, remote interventions have proved viable. WhatsApp-based support groups in Zambia have demonstrated beneficial outcomes for both responsive caregiving practices and caregivers' psychological health, even in the context of low digital literacy (Skeen et al., 2023). Similarly, weekly radio sessions and community discussions in the First Steps program enhanced parenting practices and child development outcomes (Abimpaye et al., 2019). By delivering parenting education via radio and facilitating home participation, the program led to significant improvements in nurturing activities and reductions in harsh discipline. Challenges were mitigated by training local facilitators to tailor discussions to the specific needs of the community. Collectively, these studies highlight the efficacy and adaptability of remote components in parental

interventions aimed at promoting shared reading and early childhood development in diverse settings.

Cost-effectiveness of Remote Components

Notably, these strategies are cost-effective, supporting their potential for scalability, particularly in resource-limited settings. For example, the First Steps “Intera za Mbere” program, uses radio to significantly improve child development and parenting practices with minimal resources (Jimenez et al., 2021). Similarly, weekly text messages could effectively enhance shared reading practices at home without the need for extensive resources (Guevara et al., 2020). The low cost of text messaging and its integration into existing pediatric care further supports the scalability of this approach. It was also found that daily text message reminders could improve home-reading environments, despite challenges such as time constraints (Guevara et al., 2023). Moreover, biweekly phone calls consistently support reading practices, leading to significant improvements in children's vocabulary (Chow et al., 2008). Additionally, structured online training sessions significantly enhance children's narrative skills, indicating the potential for scalable and low-cost remote training (Adinarayanan et al., 2022). These studies underscore the effectiveness and economic feasibility of remote interventions for promoting early literacy and parental engagement.

Complementary Role of Remote Components

The incorporation of multimedia messages, including video and text, slightly improved the home literacy environment while enhancing the standard ROR approach (Jimenez et al., 2021). Dialogic eBooks accessed at home significantly increased positive parent-child interactions through structured engagement (Stuckelman et al., 2022). Using a mobile app alongside traditional ROR guidance enhanced children's reading attitudes and language skills (Hutton et al., 2021). Self-instruction via video, supplemented by telephone follow-ups, significantly boosted children's

verbosity and parent-child interaction by offering flexible learning opportunities (Huebner & Meltzoff, 2005). In addition, an Internet-based parenting intervention supported by weekly coaching calls significantly improved maternal knowledge and parenting behaviors (Feil et al., 2020). These examples underscore how remote interventions can effectively complement in-person methods, making literacy training more adaptable and accessible, while reaching a broader audience. Moreover, these data reinforce our understanding of remote training or strategies as a method of service delivery instead of an intervention in itself that would replace in-person delivery.

Consequences in the Post-Pandemic World

The findings of this review are particularly relevant to the context of the post-pandemic world. The pandemic has fundamentally altered the landscape of parental interventions, leading to increased reliance on remote strategies. A systematic review (Araújo et al., 2021) showed that epidemics such as COVID-19, influenza A (H1N1), immunodeficiency syndrome (AIDS), and Ebola elevated stress levels among parents and children, resulting in various psychological and emotional consequences for families. In particular, the COVID-19 pandemic has highlighted the impact of social restrictions on mental health exacerbating parenting stress and contributing to increased child problem behaviors (Aviles et al., 2024). These findings highlight the need for resilient education systems that can deliver interventions through multiple channels. The pandemic forced parents to demonstrate high resilience to protect their children's health and emphasized the importance of human interaction in overcoming adversities. This emphasizes the need for flexible and resilient intervention strategies that include remote components. Rapid adaptation of remote technologies during the pandemic has opened new avenues for research and intervention. As we move forward, it is crucial to analyze what has worked during the pandemic and incorporate successful elements into future strategies. Given the ongoing social and technological

transformations, parental interventions must consider diverse delivery methods, including remote and hybrid approaches. Recognizing the potential of handheld devices and screen-based information can enhance parental training and make interventions more effective and inclusive in the contemporary world.

Implications for Research and Practice

This review highlights the significant impact of remote elements in enhancing the viability and engagement of shared reading parental interventions. Remote strategies improve accessibility and foster engagement, both of which are crucial for early childhood development. For instance, text messaging was the most prevalent remote component, utilized in six studies (Guevara et al., 2020; Guevara et al., 2023; Hutton et al., 2021; Jimenez et al., 2021; Riordan et al., 2021; Skeen et al., 2023), and recorded videos were employed in five studies (Arnold et al., 1994; Blom-Hoffman et al., 2007; Feil et al., 2020; Huebner & Meltzoff, 2005; Jimenez et al., 2021). Specifically, remote interventions using WhatsApp showed effectiveness across multiple studies, suggesting this platform as a promising channel for intervention delivery. These findings emphasize the importance of feasibility studies to understand how remote components can be integrated into existing frameworks and to identify potential challenges. Small-scale studies and pilot trials are crucial for testing new strategies and refining intervention methods before broader implementation. Although pilot studies provide initial insights, randomized controlled trials are essential for validating the effectiveness of remote interventions. These trials should use rigorous methodologies to ensure reliable results and generalizability. Investing in both preliminary and rigorous research will build a robust evidence base for remote components and guide the development of effective, scalable interventions that are adaptable to various contexts and needs.

Limitations

One of the challenges encountered was the substantial variation in outcome measures across the 15 articles examined. This disparity hampers the ability to perform meta-analyses and conduct quantitative comparisons. The different indicators and metrics used in these studies make it difficult to aggregate the results and draw more comprehensive conclusions. Albeit the review sheds light on the effectiveness of remote interventions published in English and Portuguese, the lack of standardized measures for certain instruments developed by the authors restricts the capacity to quantify the overall impact and compare findings across studies. Future research should prioritize standardized instruments to measure outcomes, enabling more robust analyses and comparisons. Another potential limitation of this review is that most studies were conducted in the United States. This warrants consideration as certain training strategies may require minor or significant adaptations when implemented in diverse cultural contexts and environments. Furthermore, we highlight the importance of future reviews that could benefit the field and facilitate a more knowledgeable comparison of different interventions.

Conclusion and Future Directions

Collectively, these studies suggest the potential impact of remote parent-mediated interventions and training programs on enhancing children's language and parenting skills through shared book-reading. These interventions demonstrated positive outcomes by improving narrative skills and dialogic reading behaviors to foster richer home-literacy environments and interactive reading sessions. Remote parent training focused on shared reading, whether delivered via videotapes, mobile apps, or in-person sessions, boosted parents' use of effective reading strategies and subsequently enhanced their children's verbalizations and engagement. Remote digital approaches, including video training, text messages, and WhatsApp-based programs, were found

to be effective, particularly in promoting responsive caregiving and mental health support. These findings align with well-established literature on the effectiveness of in-person training in fostering shared reading. Even minimal enhancements, such as remote video demonstrations and text message reminders, yielded modest, yet meaningful improvements in parental attitudes and children's literacy skills. These findings, although currently supported by limited empirical evidence, highlight the critical importance of accessible and scalable interventions. Overall, this review supports the integration of remote evidence-based strategies into shared reading programs to foster early relational health. Such approaches not only support children's literacy skills but also strengthen the parent-child relationship, providing a foundation for lifelong learning and well-being.

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Declaration of Interest statement

The authors have no conflicts of interest to disclose.

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Smith, J. A; Chang, S. M.; Brentani, A.; Fink, G.; Lopez-Boo, F.; Torino, B. M.; Codina, M. R.; Walker, S. P. (2023). A Remote Parenting Program and Parent and Staff Perspectives: A Randomized Trial. *Pediatrics 151*(2), 1-17; http://doi.org/10.1542/peds.2023-060221F

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Weisleder, A., Mazzuchelli, D. S. R., Lopez, A. S., Neto, W. D., Cates, C. B., Gonçalves, H. A., Fonseca, R. P., Oliveira, J., & Mendelsohn, A. L. (2018). Reading Aloud and Child Development: A Cluster-Randomized Trial in Brazil. *Pediatrics*, *141*(1), e20170723. https://doi.org/10.1542/peds.2017-0723

Willis, D. W., & Eddy, J. M. (2022). Early relational health: Innovations in child health for promotion, screening, and research. *Infant Mental Health Journal, 43*, 361–372. https://doi.org/10.1002/imhj.21937

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Supplementary Materials

Table 1

Search strategy on February, 2024

Database	*Search strategy*	*Results*
NYU Health Sciences Library	*Subject = (("Online parent training programs" OR "Parental online courses" OR "digital" OR "mobile" OR "text messages" OR "telepractice" OR "multicomponent parent intervention" OR "app" OR "nudging" OR "nudging parents" OR "mensagens de texto" OR "intervenção parental multicomponentes" OR "Videotape Training" OR "videotape training package" OR "videotaped program" OR "video training" OR "self-instructional video" OR "Parent-child interaction" OR "Parenting skills" OR "Parental abilities" OR "Positive parenting skills" OR "Parental involvement" OR "Parent-child relationship" OR "treinamento parental" OR "interação pai-filho" OR "habilidades parentais positivas" OR "habilidades parentais" OR "parental coaching" OR "coaching parental")* *AND* *("shared reading" OR "dialogic reading" OR "reading aloud" OR "leitura dialógica" OR "leitura compartilhada" OR "leitura em voz alta"))*	*25*
Scopus	*Abstract = (("Online parent training programs" OR "Parental online courses" OR "digital" OR "mobile" OR "text messages" OR "telepractice" OR "multicomponent parent intervention" OR "app" OR "nudging" OR "nudging parents" OR "mensagens de texto" OR "intervenção parental multicomponentes" OR "Videotape Training" OR "videotape training package" OR "videotaped program" OR "video training" OR "self-instructional video" OR "Parent-child interaction" OR "Parenting skills" OR "Parental abilities" OR "Positive parenting skills" OR "Parental involvement" OR "Parent-child relationship" OR "treinamento parental" OR "interação pai-filho" OR "habilidades parentais positivas" OR "habilidades parentais" OR "parental coaching" OR "coaching parental")* *AND* *("shared reading" OR "dialogic reading" OR "reading aloud" OR "leitura dialógica" OR "leitura compartilhada" OR "leitura em*	*483*

	voz alta”))	
Web of Science	*Abstract = (("Online parent training programs" OR "Parental online courses" OR “digital” OR “mobile” OR “text messages” OR “telepractice” OR “multicomponent parent intervention” OR “app” OR “nudging” OR “nudging parents” OR “mensagens de texto” OR “intervenção parental multicomponentes” OR "Videotape Training" OR "videotape training package" OR "videotaped program" OR "video training" OR "self-instructional video" OR "Parent-child interaction" OR "Parenting skills" OR "Parental abilities" OR "Positive parenting skills" OR "Parental involvement" OR "Parent-child relationship" OR “treinamento parental” OR “interação pai-filho” OR “habilidades parentais positivas” OR “habilidades parentais” OR “parental coaching” OR “coaching parental”)* *AND* *("shared reading" OR "dialogic reading" OR “reading aloud” OR “leitura dialógica” OR “leitura compartilhada” OR “leitura em voz alta”))*	*87*

Note.

1. Terms Related to the Intervention: "Parent-child interaction," "Parenting skills," "Parental abilities," "Positive parenting skills," "Parental involvement," "Parent-child relationship," "treinamento parental," "interação pai-filho," "habilidades parentais positivas," "habilidades parentais," "parental coaching," "coaching parental."

2. Terms Related to the Remote Aspect: "Online parent training programs," "Parental online courses," "digital," "mobile," "text messages," "telepractice," "multicomponent parent intervention," "app," "nudging," "nudging parents," "mensagens de texto," "intervenção parental multicomponentes," "Videotape Training," "videotape training package," "videotaped program," "video training," "self-instructional video."

3. Terms Related to Reading: "shared reading," "dialogic reading," "reading aloud," "leitura compartilhada," "leitura dialógica," "leitura em voz alta."

Table 2

Article excluded with reasons (53)

Study	*Exclusion criteria*
1. Akemoglu Y, Hinton V, Laroue D, Jefferson V. A parent-implemented shared reading intervention via telepractice. *J Early Interv*. 2022;44(2):190-210. doi:10.1177/10538151211032211.	Different population: children with disabilities
2. Al-Hassan S, Lansford J. Evaluation of the Better Parenting Programme in Jordan. *Early Child Dev Care*. 2011;181:587-598. doi:10.1080/03004431003654925.	No remotely delivered intervention
3. Aram D, Fine Y, Ziv M. Enhancing parent–child shared book reading interactions: Promoting references to the book's plot and socio-cognitive themes. *Early Child Res Q*. 2013;28(1):111-122. doi:10.1016/j.ecresq.2012.03.005.	No remotely delivered intervention
4. Bergström E, Bratt AS, Svensson I. An interactive shared reading intervention designed for preverbal infants: A feasibility study exploring early language and cognitive development. *Child Lang Teach Ther*. 2024. doi:10.1177/02656590241250234.	No remotely delivered intervention
5. Blom-Hoffman J, O'Neil-Pirozzi TM, Cutting J. Reading Together, Talk Together: The acceptability of teaching parents to use dialogic reading strategies via videotaped instruction. *Psychol Sch*. 2006;43(1):71-78. doi:10.1002/pits.20130.	Different outcome: Acceptability ratings
6. Brannon D, Dauksas L. Studying the effect dialogic reading has on family members' verbal interactions during shared reading. *Srate J*. 2012;21(2):9-20.	No remotely delivered intervention
7. Canfield CF, Miller EB, Shaw DS, Morris P, Alonso A, Mendelsohn AL. Beyond language: Impacts of shared reading on parenting stress and early parent-child relational health. *Dev Psychol*. 2020;56(7):1305-1315. doi:10.1037/dev0000940.	No remotely delivered intervention
8. Cates CB, Weisleder A, Berkule Johnson S, Seery AM, Canfield CF, Huberman H, Dreyer BP, Mendelsohn AL. Enhancing parent talk, reading, and play in primary care: Sustained impacts of the Video Interaction Project. *J Pediatr*. 2018;199:49-56.e1. doi:10.1016/j.jpeds.2018.03.002.	No remotely delivered intervention

9. Cates CB, Weisleder A, Dreyer BP, Johnson SB, Vlahovicova K, Ledesma J, Mendelsohn AL. Leveraging healthcare to promote responsive parenting: Impacts of the Video Interaction Project on parenting stress. *J Child Fam Stud*. 2016;25(3):827-835. doi:10.1007/s10826-015-0267-7.	No remotely delivered intervention
10. Chang CJ, Luo YH. A longitudinal study of maternal interaction strategies during joint book-reading in Taiwan. *J Child Lang*. 2020;47(2):401-417. doi:10.1017/S0305000919000746.	No parenting program
11. Clemens LF, Kegel CAT. Unique contribution of shared book reading on adult-child language interaction. *J Child Lang*. 2021;48(2):373-386. doi:10.1017/S0305000920000331.	No parenting program
12. Colmar SH. A parent-based book-reading intervention for disadvantaged children with language difficulties. *Child Lang Teach Ther*. 2014;30(1):79-90. doi:10.1177/0265659013507296.	Different population: Children with delayed language skills
13. Davidson C, Danby S, Ekberg S, Thorpe K. The interactional achievement of reading aloud by young children and parents during digital technology use. *J Early Child Lit*. 2021;21(4):475-498. doi:10.1177/1468798419896040.	No parenting program
14. Dicataldo R, Rowe ML, Roch M. "Let's read together": A parent-focused intervention on dialogic book reading to improve early language and literacy skills in preschool children. *Children*. 2022;9(8):1149. doi:10.3390/children9081149.	No remotely delivered intervention
15. Dowdall N, Murray L, Skeen S, Marlow M, De Pascalis L, Gardner F, Tomlinson M, Cooper PJ. Book-sharing for parenting and child development in South Africa: A randomized controlled trial. *Child Dev*. 2021;92(6):2252-2267. doi:10.1111/cdev.13619.	No remotely delivered intervention
16. Dulay KM, Cheung SK, Reyes P, McBride C. Effects of parent coaching on Filipino children's numeracy, language, and literacy skills. *J Educ Psychol*. 2019;111(4):641-662. doi:10.1037/edu0000315.	Different outcome: home numeracy
17. Elias G, Hay I, Homel R, Freiberg K. Enhancing parent–child book reading in a disadvantaged community. *Aust J Early Child*. 2006;31:1-7. doi:10.1177/183693910603100104.	No remotely delivered intervention
18. Faria VAL, Flores EP. Conversas ao redor do livro: Treino parental para a leitura dialógica [Talking about storybooks: Parental training for dialogic reading]. *Acta Comport*. 2018;26(4):467-48.	Different population: Age criterion not met.

19. France MG, Hager JM. Recruit, respect, respond: A model for working with low-income families and their preschoolers. *Read Teach*. 1993;46(7):568-572. Available from: http://www.jstor.org/stable/20201134.	No remotely delivered intervention
20. Friedberg JB, Segel E. Read-aloud parent clubs: Equipping parents to support emergent literacy. *Child Lit Educ*. 1997;28:127-136. doi:10.1023/A:1022484902203.	No remotely delivered intervention
21. Fung PC, Chow BW, McBride-Chang C. The impact of a dialogic reading program on deaf and hard-of-hearing kindergarten and early primary school-aged students in Hong Kong. *J Deaf Stud Deaf Educ*. 2005;10(1):82-95. doi:10.1093/deafed/eni005.	Different population: Deaf and hard-of-hearing children
22. Ganotice F, Downing K, Mak T, Chan B, Lee W. Enhancing parent-child relationship through dialogic reading. *Educ Stud*. 2016;43:1-16. doi:10.1080/03055698.2016.1238340.	No remotely delivered intervention
23. Genisio MH. Breaking barriers with books: A fathers' book-sharing program from prison. *J Adolesc Adult Lit*. 1996;40(2):92-100. Available from: http://www.jstor.org/stable/40016743.	No remotely delivered intervention
24. Gregory LP, Morrison TG. Lap reading for young at-risk children: Introducing families to books. *Early Child Educ J*. 1998;26(1):67-77. doi:10.1023/A:1022995027819.	No remotely delivered intervention
25. Hirsh H, Richmond M, Pampel F, Jones S, Molieri A, Jones J. Results from a randomized controlled trial of the Motheread/Fatheread early literacy intervention: Evidence of impact in a rural community. *Early Educ Dev*. 2018;30:1-22. doi:10.1080/10409289.2018.1544813.	No remotely delivered intervention
26. Hoel T, Tønnessen ES. Organizing shared digital reading in groups: Optimizing the affordances of text and medium. *AERA Open*. 2019;5(4). doi:10.1177/2332858419883822.	No parenting program
27. Hojnoski RL, Columba HL, Polignano J. Embedding mathematical dialogue in parent–child shared book reading: A preliminary investigation. *Early Educ Dev*. 2014;25(4):469-492. doi:10.1080/10409289.2013.810481.	Different outcome: mathematical concepts and vocabulary
28. Jiménez TC, Filippini AL, Gerber MM. Shared reading within Latino families: An analysis of reading interactions and language use. *Biling Res J*. 2006;30(2):431-452. doi:10.1080/15235882.2006.10162884.	Different population: Age criterion not met.

29. Kim Y, Riley D. Accelerating early language and literacy skills through a preschool-home partnership using dialogic reading: A randomized trial. *Child Youth Care Forum*. 2021;50:901-924. doi:10.1007/s10566-021-09598-1.	No remotely delivered intervention
30. Knight-McKenna M, Hollingsworth HL, Esposito J. Infant language stimulation: A mixed-methods study of low-income families' preference for and use of ten strategies. *Early Child Dev Care*. 2020;192(3):384-399. doi:10.1080/03004430.2020.1763330.	No parenting program
31. Lam S-F, Chow-Yeung K, Wong BPH, Lau KK, Tse SI. Involving parents in paired reading with preschoolers: Results from a randomized controlled trial. *Contemp Educ Psychol*. 2013;38(2):126-135. doi:10.1016/j.cedpsych.2012.12.003.	No remotely delivered intervention
32. Leung C, Hui ANN, Wong RS, Rao N, Karnilowicz W, Chung K, Chan J, Ip P. Effectiveness of a multicomponent parenting intervention for promoting social-emotional school readiness among children from low-income families in Hong Kong: A cluster randomized clinical trial. *JAMA Pediatr*. 2022;176(4):357-364. doi:10.1001/jamapediatrics.2021.6308.	Different outcome: child behavioral problems
33. Lever R, Sénéchal M. Discussing stories: On how a dialogic reading intervention improves kindergartners' oral narrative construction. *J Exp Child Psychol*. 2011;108(1):1-24. doi:10.1016/j.jecp.2010.07.002.	No remotely delivered intervention
34. Lin GC, Schoenfeld I, Thompson MM, Xia Y, Bilgin CU, Leech KA. "What color are the fish's scales?" Exploring parents' and children's natural interactions with a child-friendly virtual agent during storybook reading. *Proceedings of the 21st Annual ACM Interaction Design and Children Conference*. 2022. doi:10.1145/3501712.3529749	No parenting program
35. Lingwood J, Billington J, Rowland C. Evaluating the effectiveness of a 'real-world' shared reading intervention for preschool children and their families: A randomised controlled trial. *J Res Read*. 2020;43(4):1-16. doi:10.1111/1467-9817.12301.	No remotely delivered intervention
36. McNeill JH, Fowler SA. Let's talk: Encouraging mother-child conversations during story reading. *J Early Interv*. 1999;22(1):51-69. doi:10.1177/105381519902200106.	Different population: Children with developmental delays
37. Mendelsohn AL, Piccolo LdaR, Oliveira JBA, Mazzuchelli DSR, Lopez AS, Cates CB, Weisleder A. RCT of a reading aloud intervention in Brazil:	No remotely delivered intervention

Do impacts differ depending on parent literacy? *Early Child Res Q*. 2020;53:601-611. doi:10.1016/j.ecresq.2020.07.004.	
38. Pierson LM, Thompson JL, Ganz JB, Wattanawongwan S, Haas AN, Yllades V. Coaching parents of children with developmental disabilities to implement a modified dialogic reading intervention using low technology via telepractice. *Am J Speech Lang Pathol*. 2021;30(1):119-136. doi:10.1044/2020_AJSLP-20-00037.	Different population: children with developmental disabilities
39. Reese E, Barrett-Young A, Gilkison L, Carroll J, Das S, Riordan J, Schaughency E. Tender Shoots: A parent book-reading and reminiscing program to enhance children's oral narrative skills. *Read Writ*. 2023;36(3):541-564. doi:10.1007/s11145-022-10282-66.	No remotely delivered intervention
40. Roia A, Paviotti E, Ferluga V, Montico M, Monasta L, Ronfani L, Tamburlini G. Promoting effective child development practices in the first year of life: Does timing make a difference? *BMC Pediatr*. 2014;14:222. doi:10.1186/1471-2431-14-222.	Different outcome: timing of parental training
41. Salley B, Daniels D, Walker C, Fleming K. Shared book reading intervention for parents of infants and toddlers. *J Early Child Res*. 2022;20(3):322-340. doi:10.1177/1476718x221091462.	No remotely delivered intervention
42. Salley B, Neal C, McGovern J, et al. An exploration of Ready, Set, Share A Book! intervention for enhancing parent book sharing with infants and toddlers. *Early Child Educ J*. 2024;52:127-138. doi:10.1007/s10643-022-01412-4.	No remotely delivered intervention
43. Schapira R, Aram D. Shared book reading at home and preschoolers' socio-emotional competence. *Early Educ Dev*. 2019;31(6):819-837. doi:10.1080/10409289.2019.1692624.	Different outcome: Socio-emotional Competence
44. Schaughency E, Riordan J, Reese E, Derby M, Gillon G. Developing a community-based oral language preventive intervention: Exploring feasibility and social validity for families affected by the Canterbury earthquakes. *Infants Young Child*. 2020;33:195-218. doi:10.1097/IYC.0000000000000171.	No remotely delivered intervention
45. Scott A, McNeill B, van Bysterveldt A. Teenage mothers' language use during shared reading: An examination of quantity and quality. *Child Lang Teach Ther*. 2020;36(1):59-74. doi:10.1177/0265659020903769.	No remotely delivered intervention

46. Swain JM, Cara O. Changing the home literacy environment through participation in family literacy programmes. *J Early Child Lit*. 2019;19(4):431-458. doi:10.1177/1468798417745118.	Different population: Age criterion not met.
47. Timperley S, Schaughency E, Riordan J, et al. Tender Shoots: Effects of a preschool shared book reading preventive intervention on parent–child reading and parents' involvement in the first year of school. *Sch Ment Health*. 2022;14:238-253. doi:10.1007/s12310-022-09505-6.	No remotely delivered intervention
48. Tipton L, Blacher J, Eisenhower A. Young children with ASD: Parent strategies for interaction during adapted book reading activity. *Remedial Spec Educ*. 2017;38(3):171-180. doi:10.1177/0741932516677831.	Different population: Children with ASD
49. Tura F, Wood C, Thompson R, Lushey C. Evaluating the impact of book gifting on the reading behaviours of parents and young children. *Early Years*. 2021;43(1):75-90. doi:10.1080/09575146.2021.1908234.	No parenting program
50. Wessels S. Supporting English and Spanish literacy through a family literacy program. *Sch Community J*. 2014;24(2):25-42. Available from: http://www.schoolcommunitynetwork.org/SCJ.aspx.	No remotely delivered intervention
51. Wing-Yin Chow B, McBride-Chang C. Promoting language and literacy development through parent–child reading in Hong Kong preschoolers. *Early Educ Dev*. 2003;14(2):233-248. doi:10.1207/s15566935eed1402_6.	No remotely delivered intervention
52. Zhao J, Luo H, Zhou Y, Zhong L, Lai J. Immediate effect of dialogic reading on interactive quality of book sharing among Chinese preschool mother–child dyads. *J Chin Writ Syst*. 2021;5(3):173-184. doi:10.1177/25138502211029042.	No parenting program
53. Zibulsky J, Casbar C, Blanchard T, Morgan C. Parent question use during shared reading time: How does training affect question type and frequency? *Psychol Sch*. 2018;56. doi:10.1002/pits.22219.	No parenting program

Figure 1

Summary of Cochrane Risk-of-Bias Assessment for RCTs

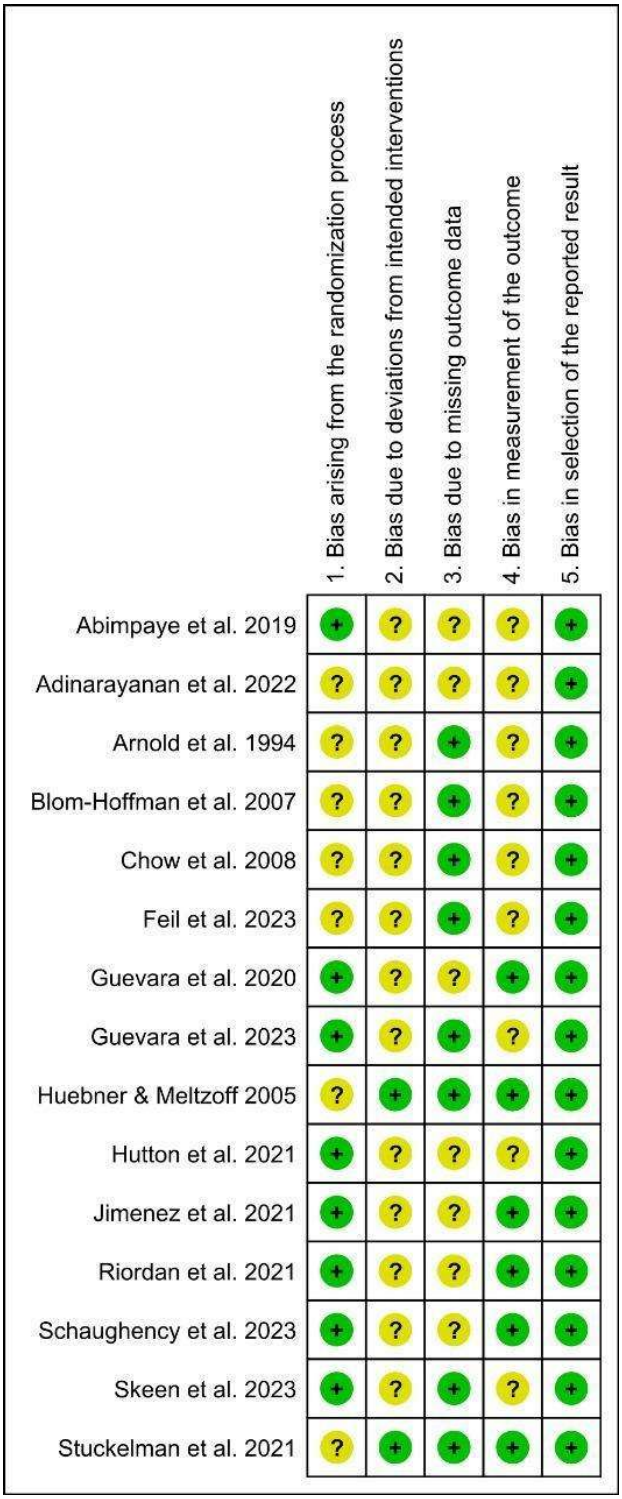
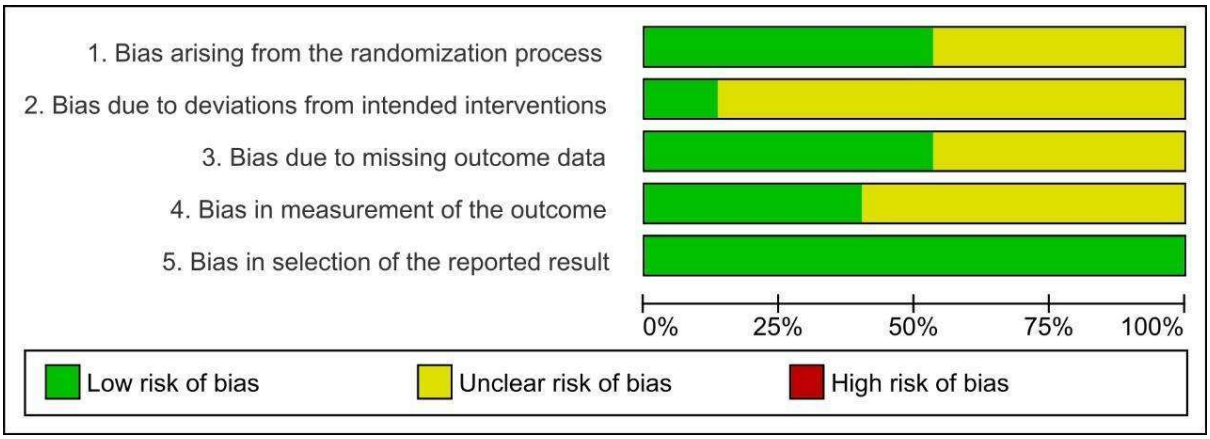


Figure 2

Risk of Bias Judgements by Domain Across 15 Included Articles



Manuscript 2 – Adapting and Evaluating the Feasibility of BrincarLerVIP: A Remote Intervention for Early Relational Health in Brazil[3]

[3] This manuscript was submitted in the peer-reviewed Journal of Child and Family Studies. Citation: Mazzuchelli, D. S. R., Pfeiffer-Flores, E., Seery, A. M., Arechiga, X., Matalon, M., Minussi, L. F. S., Sargiani, R. A., Piccolo, L. R., Roby, E., Canfield, C., & Mendelsohn, A. L. (in preparation). Remote Brazilian Educational Child Care Based Adaptation of PlayReadVIP to Support Early Relational Health. Journal of Child and Family Studies.

Parental involvement is pivotal in shaping early childhood development. The PlayReadVIP program, a relationship-based and individualized parent-child intervention, is designed to mitigate poverty-related disparities and enhance school readiness in young children from historically marginalized communities. The core component of the program is creating brief video recordings of parental interactions. These recordings, immediately followed by strengths-based and positive feedback, are intended to enhance Early Relational Health (ERH), which is crucial for a child's overall development (Roby et al., 2024a; Roby et al., 2024b). This article examines the adaptation process, feasibility, acceptability, and engagement of the PlayReadVIP, including its transition from pediatric primary care to child care settings, its shift from in-person to remote delivery, and its adaptation for Brazilian families, renamed as BrincarLerVIP em Sala.

The Role of Responsive Parenting in Promoting Early Relational Health

Parent-child interactions play a critical role during the first years of life, profoundly influencing social-emotional development, educational achievement, and overall well-being (Shaw et al., 2021; Willis & Eddy, 2022). Recent trends in child health emphasize universal health promotion and early intervention, which have become especially relevant due to the children's mental health crisis intensified by the COVID-19 pandemic (Bhushan et al., 2020; Doom et al., 2021; Whitney & Peterson, 2019). Within this context, ERH has gained prominence in recent years. It integrates insights from infant mental health, neurodevelopment, and related fields to emphasize the foundational role of positive, responsive caregiver-child interactions in shaping children's health and development from birth (Frosch et al., 2019; Klass & Navsaria, 2021). Recognizing the social, economic, and cultural embeddedness of parent-child interactions, ERH highlights that many culturally diverse interaction styles can effectively promote children's confidence, competence, and emotional well-being (FrameWorks Institute, 2020).

While ERH provides a framework for understanding the foundational role of positive caregiver-child interactions, responsive parenting focuses on the specific behaviors that foster these connections. Responsive parenting is a caregiving approach that promotes optimal child development through reciprocal parent-child interactions (Black & Aboud, 2011). Responsive parenting is one of the five interconnected and inseparable components of nurturing care for a child's health and development, alongside good health, adequate nutrition, safety and security, and opportunities for early learning (World Health Organization [WHO] & Fundo das Nações Unidas para a Infância [UNICEF], 2022). It is instrumental in nurturing care because responsive caregivers or parents are better prepared to provide the other four components (Frosch et al., 2019; Klass & Navsaria, 2021). This is also a well-established link between parental responsiveness and cognitive development, observable as early as the first year and continuing throughout childhood (Bornstein, 1989; Bornstein & Bornstein, 2007; Bradley et al., 2001; Evans et al., 2010; Landry et al., 2001; Tamis-LeMonda et al., 2001). Responsive behaviors, including attuned interactions, warmth, and contingent responses, are critical for fostering healthy development, and can buffer the negative consequences of risk factors such as poverty on children's development (Cates et al., 2016; Korom & Dozier, 2021; Landry, 2012; Piccolo et al., 2024).

The PlayReadVIP Model

PlayReadVIP (formerly known as the Video Interaction Project) is a relationship-focused, individualized intervention for parent-child interactions delivered within the pediatric primary care setting, during routine pediatric well visits. Each session includes 25-30 minutes of personalized guidance from a trained coach, oriented by a protocol, including guides and checklists. The curriculum is designed to enhance child development and school readiness through promoting activities centered on pretend play, shared reading, and daily routines. The program offers two

age-specific versions: 0-3, comprising fourteen sessions aimed at infants and toddlers, and 3-5, consisting of nine sessions designed for preschoolers. However, families are not required to attend all the sessions.

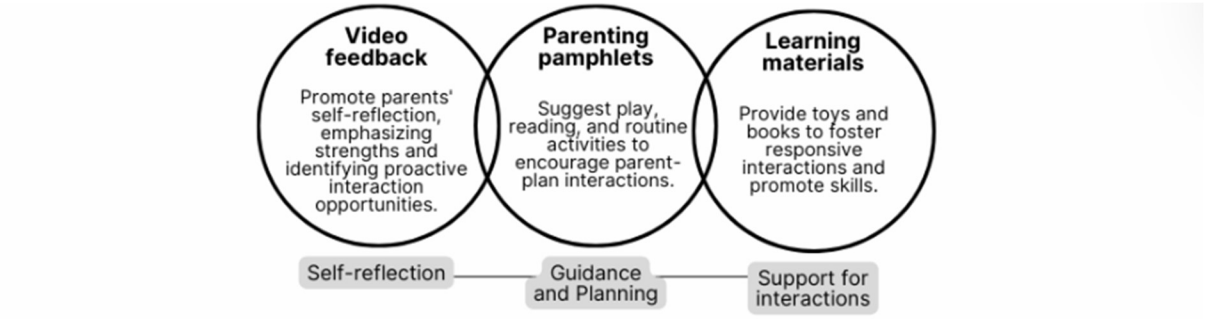
This structured approach aims to equip parents with the skills and resources necessary to effectively support their children's early development. Each session involves three key components, as summarized in Figure 1. A crucial part is recording a 2–3-minute video of the parent and child engaging in play or reading. At the start of each session the coach and parent discuss developmental goals and appropriate activities. Next, the parent is given a toy or book suitable for their child's age and developmental stage. These materials are specifically selected to encourage parent-child interaction and to support developmental progress. The coach then immediately reviews the video with the parent in real time, offering positive feedback and suggestions for improvement. Parents receive a copy of the video to support ongoing engagement at home. Lastly, the coach and parent complete a pamphlet together, reinforcing the session's key messages, and including specific suggestions for interacting with the child through play, shared reading, and daily routines.

In alignment with robust empirical findings showing how positive childhood experiences support healthy child development, the PlayReadVIP program has demonstrated its effectiveness in promoting ERH through parental relationships in pediatric primary care (Cates et. al., 2016; Mendelsohn et al., 2018; Roby et al., 2024a). Research indicates that even a single PlayReadVIP session correlates with enhanced responsive parenting practices (Piccolo et al., 2024). In addition, the program demonstrates long-lasting improvements in cognitive stimulation within the home environment, persisting 1.5 years after program completion (Cates et al., 2018).

Furthermore, PlayReadVIP has been proven effective across various settings and populations, including three different studies conducted in Brazil (Cates et al., 2016; Ciochetta et al., in press; Mendelsohn et al., 2018; Piccolo et al., 2022; Piccolo et al., in preparation; Weisleder et al., 2016). A pilot study demonstrated initial impacts of the program among Brazilian families who already consistently engaged in shared reading (Piccolo et al., in preparation). In that study, the PlayReadVIP protocol was adapted to be delivered to children falling into 3 separate age ranges (i.e., mixed-age groups). However, the program has not yet been fully adapted (including written materials for all 9 sessions of the 3 to 5 program) in low- and middle-income countries (LMICs) such as Brazil.

Figure 1

PlayReadVIP Key Components



Effectiveness of Remote Interventions

Implementing remote parenting programs tailored for specific populations within early childhood education settings can enhance the relevance, acceptability and accessibility of parental interventions for early child development (Mazzuchelli et al., in preparation). Studies have demonstrated their effectiveness across diverse demographics and settings, with variations in terms of duration of these interventions, intensity, and among the remote components utilized (Arnold et al., 1994; Blom-Hoffman et al., 2007; Feil et al., 2020; Guevara et al., 2020; Guevara et al.,

2023; Huebner & Meltzoff, 2005; Hutton et al., 2021; Jimenez et al., 2021; Riordan et al., 2021; Schaughency et al., 2023; Skeen et al., 2023). For example, video-based training programs, such as Dialogic Reading Intervention (Arnold et al., 1994), and Read Together, Talk Together (Blom-Hoffman et al. 2006, Blom-Hoffman et al. 2007) were well-received by parents and effective in teaching dialogic reading strategies, leading to improved parent-child interactions and children's verbalizations. Similarly, an Internet-adapted parenting program called Play and Learning Strategies (ePALS) significantly enhanced parenting knowledge and supportive behaviors (Feil et al., 2020). Further, Dialogic reading intervention with the Ramone program has also increased outcomes related to parent-child interaction, specifically mutuality (e.g., responsivity, reciprocity, and cooperation) after participation in a video modeling intervention (Stuckelman et al., 2022). Parental programs delivered by remote tools have also been correlated with positive changes in children's expressive vocabulary (Whitehurst et al., 1994). These findings suggest that remote programs and digital tools, such as video interventions from PlayReadVIP (Roia et al., 2014), video modeling and text messages (Jimenez et al., 2021), and mobile apps (Hutton et al., 2021) from Reach Out and Read (ROR), can effectively enhance both child development and parent-child interactions.

The Current Study

Recognizing the critical role of parental involvement in early development and the importance of supporting responsive parenting through shared reading, this study explored the acceptability, appropriateness, and potential impact of an intervention on children’s development and the quality of parent-child interactions. The emphasis of this feasibility study was to obtain information regarding the process, implementation, and preliminary findings. Feasibility studies, as Orsmond and Cohn (2015) explain, concentrate on the process and are intended to address the

question, “Can it work?”. Their primary purpose is to serve as the initial stage in the creation of an intervention with the goal of determining its potential effectiveness. Feasibility studies often explore the potential for the intervention to be adapted for different demographic subgroups or settings, assessing whether it retains its efficacy across diverse populations (Bowen et al., 2009).

The present study focused on the feasibility, acceptability, and appropriateness of remotely delivering the PlayReadVIP intervention in child care centers in Brazil (BrincarLerVIP em Sala). We utilized protocols that were previously adapted for 0–3-year-olds (Piccolo et al., in preparation) and developed additional protocols specifically adapted for 3–5-year-olds. The aims of this study were to:

1. Translate and culturally adapt PlayReadVIP for 2–5-year-olds into Brazilian Portuguese based on prior pilot studies.
2. Evaluate the feasibility, acceptability, and appropriateness of remotely delivering the BrincarLerVIP em Sala intervention.

Method

Study Design

A descriptive study was conducted in [redacted for blind review] Brazil. Data were collected using: a social validity questionnaire to assess participants’ perceptions regarding the intervention; participation frequency as a measure of engagement; and collects sociodemographic data to characterize the sample. This study was approved by the [redacted for blind review] (process number redacted).

Setting

This study took place in two childcare centers serving low-income families in [redacted for blind review], where a significant portion of the population is under 18, and 20% of children are

under five, highlighting the necessity for early childhood education. The region reflects broader urban economic trends, with a 16% unemployment rate surpassing the national average of 11.6% (Instituto Brasileiro de Geografia e Estatística [IBGE], 2022). Informal labor makes up about 40% of the workforce, leading to economic instability (Fundação Sistema Estadual de Análise de Dados [SEADE, 2021]). Public daycare centers have long waitlists, and healthcare services are limited, with one center per 10,000 residents versus the city average of one per 7,000 (reference redacted). The selected centers were conveniently contacted as they were known to serve vulnerable families based on sociodemographic data.

A significant factor influencing the study, and causing delays, was the dengue epidemic that substantially impacted Brazil; specifically, the region in which the study was conducted from March to July 2024. As of October 2024, Brazil had 6.5 million probable dengue cases, with an incidence rate of 3,221.7 per 100,000, far exceeding the WHO's epidemic threshold of 300 per 100,000. There were 5,536 confirmed deaths and 1,591 additional deaths, a 400% increase from the same period in 2023, which had 1.3 million probable cases and 1,179 deaths. São Paulo state comprised 32.3% of national cases, with 2.1 million infections and 1,786 deaths, while the city of [redacted] reported 639,066 confirmed cases and 365 deaths (Ministério da Saúde, 2024).

Enrollment Process

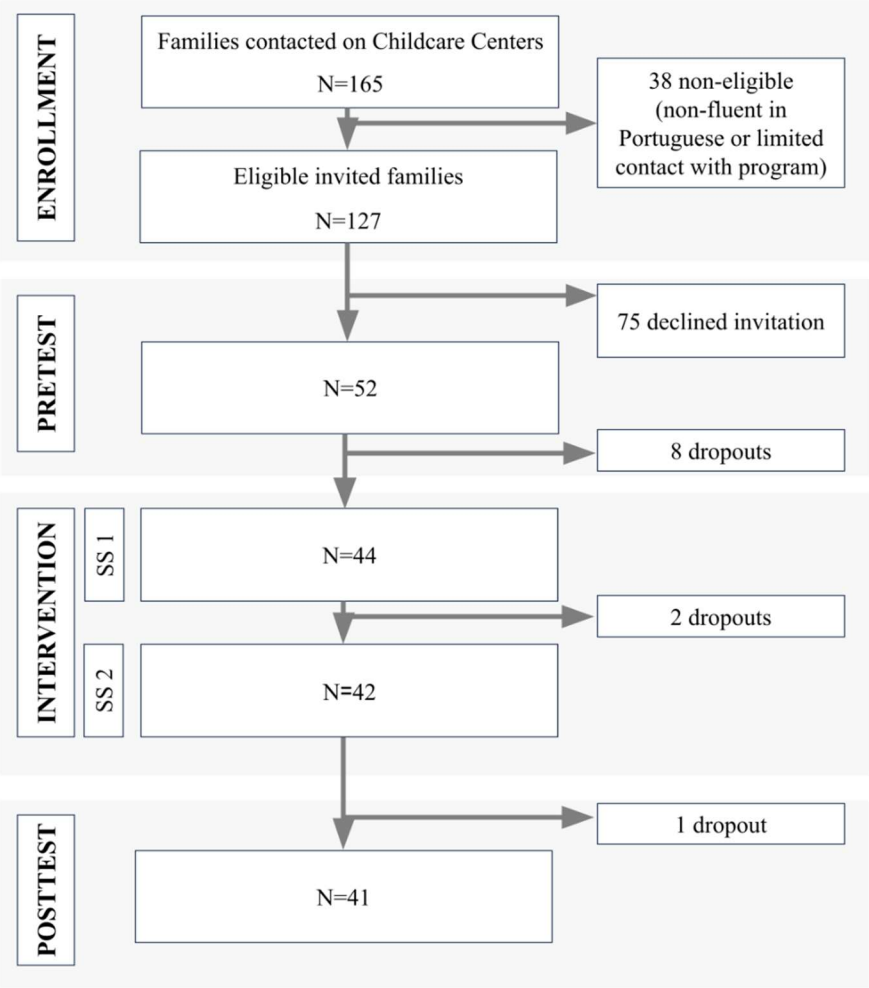
Study enrollment took place at two childcare centers from January to February 2024, and all eligible families with children between 2 and 5 years of age were invited. The exclusion criteria were based on the children and families not being fluent in Portuguese, due to the significant presence of Bolivian and Venezuelan immigrant families. Additionally, families identified by the program as having limited contact or missing documentation were also excluded.

Participants

The school database identified families with children within the specified age range. Subsequently, non-eligible families were excluded. Brief printed information was disseminated through a parent-teacher communication book, used by the school for regular communications, inviting 127 eligible families to participate. Parents who were interested in participating in a 12-week remote program were required to provide informed consent. WhatsApp messages were utilized to contact families, resulting in 52 enrollments for the pre-test. Following dropouts in the post-test phase, the study included 41 families. See Figure 2.

Figure 2

Flow Participants Enrolment



Intervention: BrincarLerVIP em Sala

BrincarLerVIP em Sala is a modified version of PlayReadVIP, translated and adapted to Brazilian Portuguese and designed for educational institutions involving remote delivery. This version was designed to address the unique obstacles encountered by working families in low- and middle-income countries (LMICs) considering previous experiences in Brazil (Mendelsohn et al., 2020; Piccolo et al., 2022; Weisleder et al., 2018). These challenges include limited time and

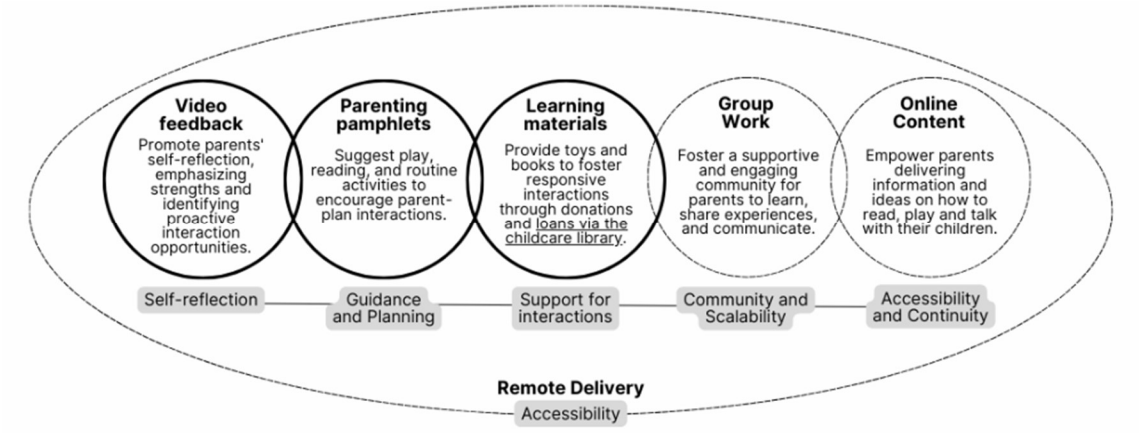
restricted access to high-quality educational materials, among other socioeconomic disadvantages and contextual factors that influence parental engagement and imply greater risks of inadequate child development and challenges in promoting responsive interactions (Hackworth et al. 2018).

The intervention spanned 12 weeks and primarily utilized remote methods supplemented by occasional in-person activities. This intervention included toys and books distribution; engaging parents in group workshops, two online and two in-person; and two online PlayReadVIP sessions with each participant's family. The group workshops model, named Universidade do Bebê (UBB), was previously tested in a parent education program implemented in Brazilian child care centers (Weisleder et al., 2018), and was an adaptation of elements from ROR and PlayReadVIP. The timing of the group meetings and individual sessions was adjusted to suit the families' schedules, maximizing participation and involvement.

The BrincarLerVIP em Sala approach maintains the core components of the original program while also incorporating a book-lending program as an extra source of learning materials, group work, and utilizing online content and remote delivery strategies, as outlined in Figure 3. Group work encompasses both online and in-person parent training to educate families on responsive parenting, reading, playing, and effective communication with their children. Dedicated WhatsApp groups for each day care center involved all participating families, fostering continuity, belonging, and engagement. These groups shared tips, information, short texts, pamphlets, newsletters, and brief videos of responsive parenting, child development, and dialogic reading. Videos featuring positive parent-child interactions from consenting families included explanations of the benefits. Online content posted at least twice a week showcased interactions from participating families, providing parents with knowledge to enhance their children's literacy and development through guided reading.

Figure 3

BrincarLerVIP em Sala Components



Measures

We assessed feasibility using three primary measures: two assessments (baseline interview and social validity questionnaire), and one indicator (attendance). We collected sociodemographic information and attendance records. We registered attendance following two PlayReadVIP sessions. See Figure 4 for information on the research and intervention activities. Additionally, we evaluated social validity by using a questionnaire specifically designed by the authors to assess acceptability and engagement. In the pre- and post-test phases, we also measured the children's and parenting outcomes. Nevertheless, the present investigation concentrates on the aforementioned measures. The baseline interview and validity social questionnaire, which assessed sociodemographic characteristics and acceptance, respectively, are described below.

Baseline interview

A battery of questions developed by the research team and used in previous studies with similar populations (Mendelsohn et al., 2020; Piccolo et al., 2022; Weisleder et al., 2018) was utilized before the intervention. The questionnaire gathered comprehensive data on children's

sociodemographics, health, family context, and parenting practices. Key domains included sociodemographics and family context; health and food security; parenting and family dynamics; parenting practices and child activities; caregivers' mental health and well-being; and experiences of violence or trauma.

Social Validity Questionnaire

The Social Validity Questionnaire was administered at the end of the intervention to assess participants' perceptions of the program's impact, acceptability, and effectiveness. It employed two 4-point Likert scales. One scale assessed the program's impact, feasibility, and components from "strongly agree" to "strongly disagree." The other evaluated satisfaction with program components, with responses ranging from "excellent, contributed significantly, and exceeded my expectations" to "terrible, did not contribute at all, and did not meet my needs," plus an option for non-participation. It was adapted from previous scales used in acceptability research (Piccolo et al., in prep.) and applied behavior analysis (Guinness et al., 2024), which included a close-ended and one open-ended question.

The questionnaire was organized into three sessions: program impact, program components, and feasibility. The program's impact included the following domains: learning and knowledge, acceptability of activities, and improvement in child development. Program components encompass weekly book borrowing or traveling books, individual online PlayReadVIP sessions with specialists, WhatsApp groups, online content, group meetings, and learning materials. Feasibility involved engagement, relevance, and format. It captured participants' perspectives on learning gains and the ease of integrating activities into routines and child development improvements. It also assessed satisfaction with program elements, exploring engagement, alignment with values and culture, and preferences for strategies and formats (see

Supplementary Material). The primary goal was to evaluate the relevance and value of the program for participants' daily lives and perceived benefits to child development.

Procedures

The assessments were conducted online or at childcare centers and were performed by research assistants, who were either psychologists or undergraduate psychology students who had been trained and supervised by the research team. The assessments comprised three components: parent interviews, observations of parent-child interactions, and direct assessments of child outcomes.

Aim 1: Translation and Cultural Adaptation

Translation and material adaptation. To address aim 1, two native Portuguese-speaking psychologists independently translated the guides, checklists, and protocols into Brazilian Portuguese. The parent guides used translated and adapted versions of the standard guides (for 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, and 60 months old). A third psychologist synthesized these translations, followed by back translation and comparison with the original, resulting in the final Portuguese version. The final version was defined by content, cultural relevance, and language appropriateness, following PlayReadVIP protocols to ensure fidelity to core components and better fit Brazilian families. These adaptations aligned with ecological and literature-based models (Bernal et al., 1995) for content, procedures, and remote delivery, focusing on linguistic suitability, effective delivery methods, and cultural context. It is worth emphasizing that BrincarLerVIP em Sala was delivered online and adapted for a new child care setting.

The learning materials were adapted for the cultural context using the standard PlayReadVIP list of books and toys used in the United States. Based on age appropriateness, cultural relevance, linguistic suitability, and availability, a collection of books and one toy was

selected. To ensure viable toy distribution and avoid errors if sessions were rescheduled, two types of toys were chosen for two age ranges: 27 months or less and 28 months or more. The first toy corresponded to the standard 27-month session toy, a puzzle, and the second one corresponded to the standard 36-month session toy, a grocery basket. Books provided were from a Brazilian collection for children aged two to four. Following the PlayReadVIP adaptation protocol, we used the FRAME Framework for tracking adaptations and modifications (Stirman et al., 2019).

Adaptation of the intervention to childcare settings. The initial step involved examining the childcare center's context to understand its routines and challenges in implementing the intervention. Meetings were held with the directors and coordinators of the childcare centers to assess these stakeholders' perceptions. This analysis allowed us to tailor the PlayReadVIP curriculum for preschool-aged children in those settings. Based on this information, we adjusted the strategies to align with the center's educational goals. Additionally, we conducted training sessions to equip staff with the necessary knowledge for effective implementation of the adapted intervention.

Adaptation for remote delivery. To ensure successful remote intervention delivery, a comprehensive technology assessment evaluated childcare centers' infrastructure and families' access. Meetings with childcare directors and supervisors before the pre-test provided insights into their communication methods with families, the effectiveness of online meetings, and parents' access to mobile phones, the Internet, and related resources. The most suitable digital platform was then selected for its user friendliness and accessibility. Digital resources, such as instructional videos, interactive content, and communication tools, were developed to facilitate intervention and engage both staff and families effectively.

Aim 2: Evaluation of Feasibility, Acceptability, and Appropriateness

Implementation. The intervention included continuous support and monitoring by the research team for smooth implementation. After the pre-test, participants joined a WhatsApp group to receive and share text messages, videos, newsletters, and motivational cards. Parents were contacted twice, in the first and third months, to schedule remote sessions with a specialist. Weekly virtual check-ins with childcare staff and families addressed challenges, provided support, and ensured ongoing engagement.

Evaluation. The evaluation phase assessed the remote intervention's feasibility, acceptability, and appropriateness by examining participation and completion rates as well as social validity. Two assessments were conducted, one pre- and one post-intervention. Parents who consented were interviewed and tested, choosing to complete the test either at the start or end of the school day, with part of the interview conducted remotely.

Data Analysis

Quantitative Analysis

We performed descriptive analyses to evaluate the sample's characteristics, to represent categorical variables and examination of social validity, which encompassed both the total by domain and individual scores by indicators.

Qualitative Analyses

At the end of the social validity questionnaire, parents were asked to comment on their main impressions of PlayReadVIP and/or suggest improvements. Qualitative responses were analyzed to identify common themes and patterns, using the thematic analysis method (Braun & Clarke, 2006). This method involves familiarizing with the data, generating initial codes, searching for themes, reviewing and defining these themes, and producing a report synthesizing the findings.

Thematic analysis is useful for capturing the complexity of participants' perspectives, revealing insights into underlying meanings and social contexts. Its flexibility makes it suitable for various theoretical and epistemological applications.

The initial step involved repeatedly reading the transcripts of the validity social questionnaire to identify patterns and open codes. The analysis then progressed to finding themes within these codes, sorting them into potential themes, and collating relevant extracts. Codes were systematically compared and refined to maintain consistency and reliability (Braun & Clarke, 2006). Naming emergent categories involved reflecting on the themes and using descriptive language to encapsulate their core message.

Results

Sociodemographics

Sociodemographic information collected at pretest can be seen in Table 1. Most participants were mothers, with over half identifying as multiracial or black. The majority were married or cohabited. Monthly incomes varied between BRL 750 and 15,000 (mean BRL 3,719.70, SD BRL 6,503.65), with 27% receiving Bolsa Família, a conditional cash transfer program aimed at reducing poverty and inequality through financial aid based on school attendance and health checkups (Lindert et al., 2007). In February 2024, the exchange rate was about 1 BRL to 0.2 USD, and the minimum wage was R$1,320.00 per month, equivalent to approximately $264.00 USD. Food insecurity affected 32% of the families. Educational level varied, with 51% having a low education level (high school graduate or less). Technological access was widespread.

Table 1

Sample Characteristic N = 41

Characteristics	*Participants, No. (%))*
Children	
Age, mean (SD)	*39.63 (601)*
Female, %	*51% (21)*
Has siblings, %	*63% (26)*
Race, black and more than one race, %	*66% (27)*
Parents	
Maternal respondents, %	*98% (40)*
Age, mean (SD)	*32.23 (6,29)*
Married or Cohabiting, %	*83% (34)*
Education Level	
Less than middle school, %	*7% (3)*
Less than high school, %	*7% (3)*
Graduated high school, %	*27% (11)*
Incomplete College, %	*22% (9)*
Completed College, %	*32% (13)*
Graduate School, %	*5% (2)*
Technological access	
WhatsApp usage, %	*100% (41)*
Wi-Fi at home, %	*73% (30)*
Income	
Month Income, mean (SD), R$	*3919.26 (3422.30)*
Food Insecurity, %	*32%**
*Bolsa Família**, %*	*27% (11)*

*This value combines two questions about the lack of consistent access to adequate, safe, and nutritious food.
**Note. Bolsa Família is. Brazil's conditional cash transfer program for low-income families.

Aim1: Translation and Cultural Adaptation

Initial translations and adaptations required only minor adjustments, including term modifications, pamphlet creation, and visual design improvements. Previous research translations

adapted guides for three age ranges (0–18 months, 19–35 months, and 36–60 months) aligning with the study's objectives (Piccolo et al., in prep.). We translated each parent guide for the 3-5 age range, consistent with standard PlayReadVIP delivery. Feedback from prior pilot studies confirmed the clarity and cultural relevance of the language, terms, and examples used (Ciochetta et al., in prep.).

Aim 2: Adaptation and Evaluation of Feasibility, Acceptability, and Appropriateness

Quantitative Analysis

Despite challenges such as the dengue epidemic affecting many teachers, parents, and children, which caused delays in the first intervention sessions, feasibility was proven through high engagement and completion rates. Forty-three families (83%) participated in the initial session, including 15 who were unable to attend initially due to a dengue epidemic but subsequently did so. A total of 42 families (81%) participated in the second session. The program's remote delivery format allowed flexibility, enabling sessions to be rescheduled and completed later than initially planned.

Table 2 summarizes results from the closed-ended questions, organized into three primary domains (program impact, components, and feasibility) and by indicators merging question results. Participants evaluated the program's overall effectiveness, specific components, and feasibility on a scale from 1 (strongly disagree) to 4 (strongly agree). Mean ratings were high, exceeding 3 in all domains and indicators, indicating strong agreement and positive evaluations. The program components domain was particularly well-received, with an average score of 3.5. The highest-rated indicators within this domain were Online PlayReadVIP Session, Group Meetings and Learning Materials, each scoring an average of 3.7. However, the Learning and Knowledge indicator, and the Weekly Book Borrowing component had the lowest mean score of 3.1.

Table 2

Program Impact, Components, and Feasibility Results

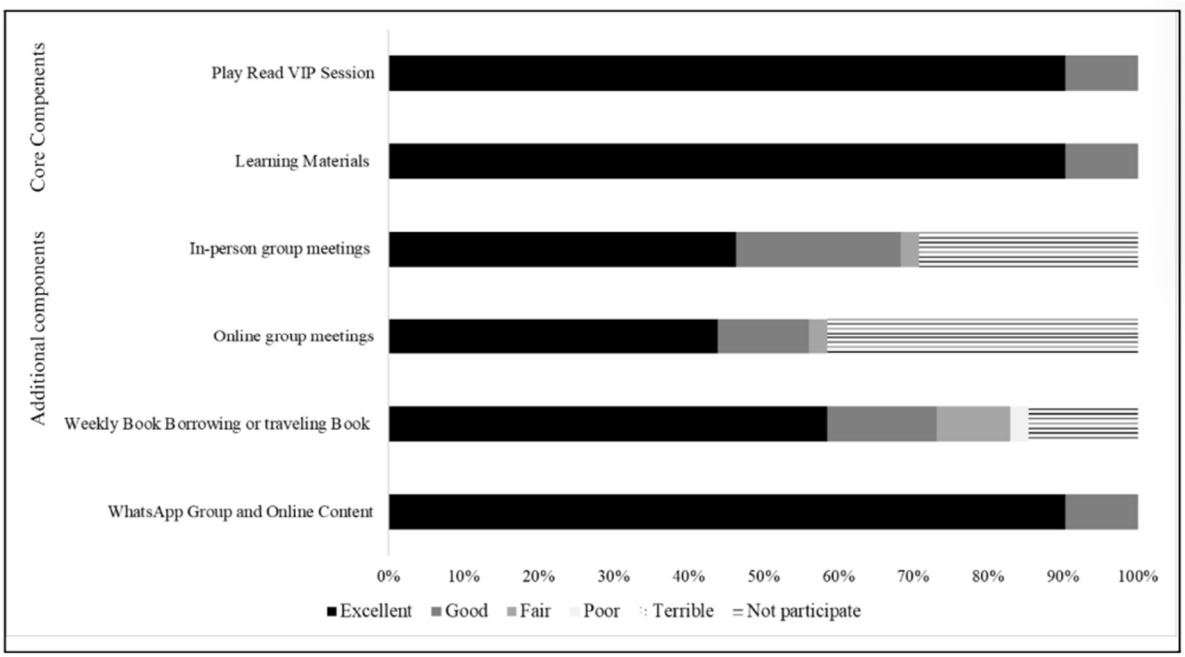
Domain/ Indicator	*Mean*	*Range*
Program Impact	*3,3*	*2-4*
Acceptability of Activities	*3,4*	*2-4*
Learning and Knowledge	*3,1*	*2-4*
Improvement in Child Development	*3,5*	*2-4*
Program Component	*3,5*	*1-4*
Weekly Book Borrowing or traveling Book	*3,1*	*1-4*
Online PlayReadVIP Session	*3,7*	*2-4*
WhatsApp Group and Online Content	*3,4*	*2-4*
Group Meetings	*3,7*	*3-4*
Learning Materials	*3,7*	*3-4*
Feasibility	*3,6*	*2-4*
Engagement	*3,6*	*2-4*
Relevance	*3,7*	*2-4*
Format	*3,5*	*2-4*

Note. 1 (strongly disagree) to 4 (strongly agree); higher scores reflect more positive attitude regarding program

When asked about their preferred strategies in the program, the most frequent answers were Online PlayReadVIP sessions and Learning Materials. These components also received the highest approval ratings, which were marked as excellent or good. Notably, online and in-person group meetings had the highest non-participation rates, with 41% absent online and 29% absent in-person (see Figure 4).

Figure 4

Approval by intervention component



Qualitative Analysis

The interpretative stage of the qualitative analysis began with analyzing responses to the last questionnaire question. Recurring themes from this analysis are presented in the Supplementary material. We then identified four thematic categories: 1) Overall positive experience, 2) Child development gains, 3) Parenting and family dynamics, and 4) Challenges and suggestions for improvement.

1. Overall Positive Experience

Participants reported a generally positive experience with the program, noting its benefits for children and families. They expressed satisfaction and gratitude for participating, highlighting the benefits and session quality. One participant stated, *"I really liked it; it was very valuable, especially because this is a public school."* Another remarked, "*It was interesting how it was done,*

because I have another daughter, and I had never experienced anything like it." Emphasizing personalized attention, a participant mentioned, *"I found it very important, especially the individual session."*

One participant expressed a sense of gratitude and novelty, stating, *"it was an incredible experience, I can only be grateful. It was the first time I participated in a program like this."* Another expressed appreciation for the individual sessions: *"I am especially grateful for what I learned in the individual sessions."* Participants valued the support of the program, *"It seemed like I needed this! In particular, to feel welcome, it is rare for someone to ask if we are okay. As a mother, it is good to talk about our feelings."*

Participants valued the program despite busy schedules, with one stating, *"If there were more opportunities, I would do it because even in the rush of everyday life, there is a little time to spare."* The overall appreciation and desire for broader access were summed up by another participant: *"It's a shame it ended, it was too short. It would be very good if other children and other daycare centers could have this experience. Those who did not participate regretted this. People from other daycare centers were asking why this was not available to them. It was very worthwhile."*

2. Child Development Gains

Participants noted improvements in their children's cognitive and behavioral development, especially in reading interest and communication skills. Parents reported enhanced perception and understanding of their children's progress. One observed, *"I saw her pointing and showing initiative during reading."* Another noted, *"It helped my daughter develop much more."* The program's impact on communication was highlighted by a parent who said, *"After this program, my daughter is more communicative."* A reduction in shyness was another positive outcome, as

one shared, *"We were satisfied, it reduced my daughter's timidity."* Parents appreciated the program's insights, with one stating, *"I could observe things in my son that I would never have seen without guidance."* Another parent expressed surprise at their child's progress, saying, *"I would never have imagined that he would already be able to learn the letters."* The program's tangible learning materials were also valued, as one remarked, *"It was nice to receive books and the toy because it helps my child learn and realize he was part of something special."*

3. Parenting and Family Dynamics

This category emerged as a major theme and consisted of the following interrelated sub-themes where participants noted the program's impact on their parenting and interactions with their children. It encouraged family participation in reading and cognitive development activities, enhancing family bonds and creating a positive reading dynamic. One participant stated, *"The program encouraged my mother to read with my daughter."* The inclusion of other caregivers was appreciated, as another participant mentioned, *"I liked that the program allowed other caregivers to participate; my mother loved reading with her and the whole family became more engaged in having reading moments."*

The "traveling book" and group meetings were also valued, with a participant sharing, *"I really liked the traveling book and the group meeting because I also learned from children of other families, which are sometimes different from ours."* Participants also noted the broader family benefits, *"It was very important for me and my family. We learned a lot about stimulating reading."* The program supported personal growth, as a participant shared, *"It helped me to become a better mother."* Others reflected on their own experiences and aspirations for their children: *"I never had the experience of my mother sitting and reading with me, and I always wanted my child to have that relationship with books."* The program provided direction and

support, as another participant stated, *"The program gave me a 'north' [guidance] and greatly helped my interaction with my daughter."*

The intervention was considered important for parent-child relationships, with one parent emphasizing, *"It was very important for the relationship between parents and children, who normally don't have this interaction."* The program was also seen as enhancing connections and awareness, as reflected in the comment, *"It was important for my connection with my daughter and learning things that often go unnoticed because we don't know how to contribute to our child's development."*

A change in storytelling was also noted, *"I used to tell the story and say 'don't interrupt me', 'let mommy finish,' but now I don't, now I let her talk and usually comment along with her daily activities."* Additionally, parents found the program valuable for providing respite and focus, with one first-time mother noting *"As a first-time mother, it gave me support to take a break from the daily rush and pay attention to my son and his needs."*

4. Challenges and Improvement Suggestions

Participants reported challenges such as time constraints, frustrations, and logistical issues, and suggested improvements. One participant expressed frustration: *"I am very hard on myself, and not being able to do it every day was frustrating for me."* Another noted a logistical challenge: *"Our difficulty was that no one in the family picks him up or drops him off, so we depend on the teacher to send the books."* A participant proposed holding in-person meetings on Saturdays to increase parental participation. Time constraints were frequently mentioned; one parent noted, *"If the program lasted longer, I could develop more,"* while another said, *"The traveling book or book loan did not reach me every week, unfortunately. My family couldn't get books every week."* Work-related challenges were also noted, *"The negative point was on my part because my work routine*

is very heavy; I couldn't participate much because I didn't have enough time." Additionally, digital communication engagement was noted as an area for improvement, with a participant observing, *"People didn't participate much in the WhatsApp group."*

Discussion

This study aimed to adapt and assess the feasibility, acceptability, and appropriateness of remotely delivering BrincarLerVIP em Sala, an adaptation of PlayReadVIP, to preschool-aged children and families in Brazil. While the original PlayReadVIP is conducted in healthcare settings, this study used childcare centers, marking a novel application in Brazil. The translation and cultural adaptation processes were largely successful, requiring only minor adjustments, which confirmed the cultural relevance and clarity of terms, as supported by feedback from a prior pilot study (Piccolo et al., in preparation). These findings provide evidence that the BrincarLerVIP em Sala can be effectively adapted for different cultural contexts with minimal modifications.

The collected data were analyzed to identify the strengths, areas for improvement, and overall effectiveness of the adapted intervention. Despite significant external challenges such as the dengue epidemic impacting teachers, parents, and children, the feasibility of the program was demonstrated through high engagement and completion rates. The remote delivery format seemed appropriate, allowing sessions to be rescheduled and completed regardless of the initial delays. The successful adaptation and implementation of this program underscores its potential for broader application.

The most well-rated components were the PlayReadVIP sessions and learning materials. These results highlight the acceptability of the core program components. It is noteworthy that although parents had presented a high non-participation rates for online and in-person group workshops, those who attended reported a positive perception of these activities, reinforcing their

importance for participant engagement and intervention success. On the other hand, the components that relied directly on teachers' engagement, as weekly book borrowing or traveling book, appeared to be less well evaluated by parents, which could pose a challenge for scalability, as the most highly rated elements were delivered by individuals with specialized training.

Qualitative analysis indicated a generally positive program experience, benefiting both children and families, consistent with a Brazilian pilot study (Piccolo et al., in preparation). The pilot study collected feedback on cultural relevance and acceptability from interviews with 15 families attending three PlayReadVIP sessions and from PlayReadVIP coaches. The program impacted parenting practices and family dynamics by promoting reading activities and strengthening family bonds. Nonetheless, participants reported challenges, such as time constraints, logistical issues, and areas for potential improvement.

Conducting a feasibility study is a developmental learning process that enables the adaptation of study procedures and intervention to achieve the most promising outcomes (Orsmond & Cohn, 2015). The current results highlight the potential of remote, relationship-based program delivery through childcare settings to increase the reach and impact of responsive parenting interventions, especially among underserved families in Brazil and other low- to middle-income countries.

Families voluntarily participating in the program may have naturally included those more interested, explaining the high engagement rate. Hackworth et al. (2018) showed that successful parenting programs must address multiple factors to engage target populations. They identified individual, programmatic, and contextual risk factors for poor engagement at each service stage. Vulnerable parents are more likely to engage in prevention-focused interventions when offered through universally accessible platforms. Notably, PlayReadVIP has effectively reached hard-to-

engage mothers in the US (Miller et al., 2020) by leveraging healthcare as a universally accessible platform, while similar success has been observed in educational settings. However, economic hardship, single young parenthood, low parental education, minority status, and mental health challenges are linked to lower chances of enrolling in, engaging with, or completing prevention programs (Hackworth et al., 2018). Therefore, strategies are needed to reach families who do not spontaneously participate, as they are often the ones in greatest need of support.

Though not the main goal, the intervention offered therapeutic value and support to participating families. Feedback during post-test sessions highlighted the benefits of conversations with professionals, indicating social validity. Notably, while original PlayReadVIP sessions last 25-30 minutes, the current study's sessions averaged 35-40 minutes, likely due to the online format, which requires time adjustments for connection issues and home-based interruptions. This duration might also reflect Brazilian cultural and social traits. Led by clinical psychologists, the sessions fostered strong bonds, enabling more open family engagement. Brazilians are typically informal and communicative, and value being heard and appreciated, which enhances connection in various contexts (Torres et al., 2020). Many participants, mostly working mothers, appreciated the opportunity to speak freely, as they are often involved in practical work, and are subject to multiple demands. The intervention seemed to have provided an opportunity for them to be heard as individuals.

Implications for Research and Practice

This study demonstrated the feasibility of using child care settings as a platform for parental intervention. It also highlighted the viability of the complex integration of classroom activities, teacher support, and family in parenting programs. Future research should further investigate child

developmental gains through child assessments beyond parental reports to demonstrate the impact of this adaptation.

Limitations

Several limitations must be acknowledged. The study faced external challenges, notably a dengue epidemic, which affected participation rates and caused delays in intervention sessions. The PlayReadVIP sessions were delivered by psychologists with clinical experience, and this might be a limitation to replicability, needing to be studied by a bachelor's level specialist. Additionally, reliance on self-reported data may introduce bias as participants may provide socially desirable responses. Finally, this study's focus on a specific cultural context may limit the generalizability of the findings to other settings.

Conclusion

The Brazilian adaptation of PlayReadVIP, BrincarLerVIP em Sala, has shown promise as a feasible, acceptable, and appropriate program for educational child care centers in Brazil. The successful adaptation and implementation for remote delivery highlight its potential for broader application in similar contexts. Future research should continue to refine and expand the remote delivery of interventions in parental programs through educational settings to enhance accessibility, efficiency, and overall impact.

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Supplementary material

Table 1

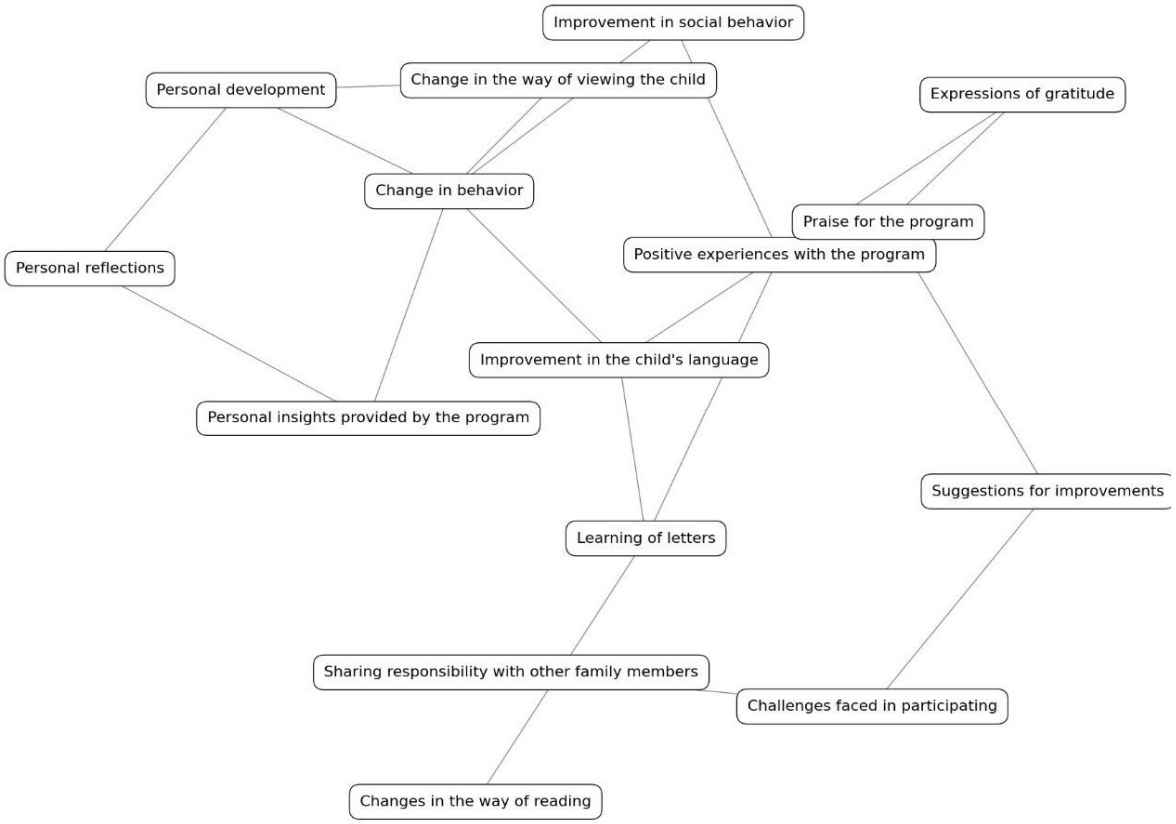
Social Validity Questionnaire Overview

Domain	*Indicator*	*Questions*
Program Impact	*Learning and Knowledge*	● *I learned new things about play and family reading.* ● *My knowledge about play and family reading remained the same.* ● *I would be able to talk about play and family reading with friends.* ● *The program left me more confused about play and family reading.*
	Acceptability of Activities	● *The program's activities are easy to do and fit into my daily routine.* ● *I found it tough to use the tips in my daily schedule or didn't have time to do it.*
	Improvement in Child Development	● *My child seems to enjoy the moments we had during the program.* ● *The program has helped my child learn better ways to talk and play.* ● *I see my child doing better at home, daycare, with family, and other places we go.*
Program Components	*Weekly Book Borrowing or traveling Book*	● *The Book borrowing allowed my child and I to read different books at home.* ● *I did not receive or get books every week.* ● *I found it hard to include the reading routine in my home.* ● *It was really fun to play and read at home and it became a new habit in our family.*
	Online Individual Sessions with Specialist	● *I felt comfortable speaking during the online individual sessions.* ● *I felt the individual sessions with a specialist were helpful to me as a parent.* ● *I felt that the sessions with the program specialist were uninteresting or unhelpful.*
	WhatsApp Group and Online Content	● *The WhatsApp group was an opportunity to share experiences with other parents.* ● *The WhatsApp content didn't add much to what I had already learned before.*
	Group Meetings	● *The group meetings were an environment where people could talk and feel heard.* ● *The group meetings were essential to learn important things about play and reading in the family.*

	Learning Materials (Toys and Books)	● *The learning materials were aligned with my child's needs and my family's values.* ● *The toys and books were not necessary or not good enough.*
	Satisfaction with each component	● *Indicate how satisfied you were with each component of the intervention, including* ● *Weekly book borrowing or Traveling book, Online individual sessions with specialist, WhatsApp group and shared online content, In-person group meetings, Online group meetings, Donation of toys and books.*
	Favorites strategies	● *Select two that were your favorites strategies: Weekly book borrowing or Traveling book, Online individual sessions with specialists, WhatsApp group and shared online content, In-person group meetings, Online group meetings, Donation of toys and books.*
Feasibility	*Engagement*	● *I felt welcomed in the activities.* ● *I would participate in the program again if given the opportunity.* ● *I found it hard to engage with the program.*
	Relevance	● *I believe that the program is important for my child's development now and in the future.* ● *The program respected my values, culture and how we live.* ● *I feel that the program was not important for me as a parent.*
	Format	● *I wish the program had lasted for more than 12 weeks.* ● *I felt the program was too long and tiring.* ● *I liked having online components because they helped me participate.* ● *I didn't like the online format; I wish everything was in person.*
Open-ended question		● *Thinking about everything we asked, would you like to add anything that we have not asked you? Or highlight something? - such as your main impression and/or suggestions.*

Figure 1

Thematic Map



Manuscript 3 – Enhancing Parent-Child Interactions and Child Development in Brazilian Educational Settings: Pre-Post Impact of Adapted PlayReadVIP[4]

[4] This manuscript is prepared for submission to the peer-reviewed Early Childhood Education Journal and is the third of four manuscripts prepared for a journal-ready doctoral dissertation.

Abstract

Early childhood development is a critical global priority, with responsive parent-child interactions serving as a foundation for lifelong learning outcomes. In Brazil, significant disparities persist in early childhood development, particularly among the 23 million children living in poverty with limited access to quality learning experiences. This study examined BrincarLerVIP em Sala, a culturally adapted version of the PlayReadVIP program, implemented in Brazilian educational childcare settings. Using a one group pre-post design with 41 parent-child dyads with children 26 to 48 months old from low-income communities in São Paulo, we investigated the program's impact on parent-child interactions and child development outcomes. The 3-month intervention included remote delivery of 2 BrincarLerVIP em Sala sessions, and additional components, including WhatsApp meetings, parent group workshops, and a book-lending system. Results demonstrated large improvements in cognitive stimulation practices ($p<0.001$), alongside modest enhancements in interactive reading behaviors ($p<0.05$), parental self-efficacy ($p<0.05$). Children showed substantial gains in receptive vocabulary ($p<0.001$), phonological short-term memory ($p<0.001$), and improvements in expressive language development ($p<0.001$). The program's success across socioeconomically diverse families suggests its potential scalability in resource-constrained settings. However, methodological limitations including the absence of a control group, small sample size, and reliance on parental self-report measures constrain causal inferences. These findings contribute to the limited research on evidence-based parenting interventions in low- and middle-income countries, highlighting the feasibility of implementing relationship-focused programs through educational institutions to enhance early childhood development and promote school readiness in vulnerable populations.

Keywords: Early childhood intervention; Parent-child interaction; Responsive parenting; Brazilian educational settings; PlayReadVIP adaptation

Early childhood development is a critical global priority, with recent reports from the United Nations and World Health Organization emphasizing the urgency of supporting children's earliest years through responsive relationships and positive learning experiences (WHO & UNICEF, 2022; UN, 2015). These early experiences, particularly responsive interactions between caregivers and children, are fundamental in shaping children's developmental trajectories and future outcomes (Kendrick et al., 2000; Lobo et al., 2024; Shonkoff, 2010). In this context, responsive parenting interventions have gained increasing attention for their effectiveness in promoting school readiness and reducing developmental inequities (Willis & Eddy, 2022).

In Brazil, this global priority intersects with unique challenges and opportunities. While the country has achieved remarkable progress in early education access, with 92.9% of children aged 4-5 years and 39% of children under three attending educational centers (IBGE, 2023), significant disparities in early childhood development persist. Approximately 23 million Brazilian children live in poverty (UNICEF, 2023), as subsisting on approximately $2.15 per day, as per the international poverty line (WHO, 2022). These children face restricted access to quality early learning experiences and developmental support (Campos et al, 2010; Cipriano et al., 2021; Santos, 2022). These challenges are particularly pronounced in low-income communities, where children often experience fewer opportunities for enriched early learning experiences (Piccolo et al., 2016).

Parenting interventions focused on sensitive responsiveness and early relational health more broadly significantly improve caregiving practices in low-income families, where parents often face additional stressors that can negatively impact their interactions with children (Garner et al., 2021; Healy et al., 2024; Willis et al., 2022). Enhancing parental responsiveness through targeted programs serves as a protective factor against the adverse effects of socioeconomic deprivation, highlighting the crucial role of parent-child relationships in

supporting development in the context of poverty. Strengthening parental relationships and support systems in low-income environments could substantially improve children's educational readiness. Such interventions that enhance parental involvement are essential for breaking cycles of poverty and fostering better educational trajectories for children (Wolf & McCoy, 2019).

Significant progress has been made in understanding and promoting early relational health, particularly in the United States, where programs such as PlayReadVIP have demonstrated promising results. PlayReadVIP, previously called the Video Interaction Project, is a tailored intervention aimed at enhancing parent-child interactions, conducted within pediatric primary care during standard check-ups (Mendelsohn et al. 2011). Each session consists of 25-30 minutes of customized guidance and planning facilitated by a non-clinical trained coach, following a specific protocol with guides and checklists. Evidence from prior studies in the U.S. show that the program's focus on responsive interactions between caregivers and children, results in enhanced, social-emotional and language development, and promoting school readiness (Cates et. al., 2016; Cates et. al., 2018; Mendelsohn et al., 2018; Miller et al., 2024; Roby et al., 2024). Previous research has shown that adapting such programs for the Brazilian context can yield substantial impacts. For instance, a group-based model incorporating elements of PlayReadVIP and Reach Out and Read demonstrated positive outcomes in two Brazilian communities (Weisleder et al, 2018, Piccolo et al., 2022a).

However, significant gaps remain in adapting and implementing evidence-based early relational health interventions in Brazil's unique context. To date, there has been no study of PlayReadVIP delivered one-on-one with low-income families in Brazil during the preschool period, including in the context of early childhood education This gap is particularly noteworthy given Brazil's extensive early childhood education network, where educational child care centers serve not only as educational spaces but as potential platforms for

implementing comprehensive interventions that can support both child development and parental engagement (Marturano & Elias, 2016).

Brazil's educational child care centers present a compelling opportunity for intervention implementation. These centers, particularly in vulnerable communities, represent a crucial point of contact with families, offering a structured environment where evidence-based programs can reach both children and families (Campos et al., 2010). Furthermore, the high attendance rates in these centers provide a unique opportunity for universal access and engagement with families during critical developmental periods.

Recognizing this potential, we first developed and adapted the PlayReadVIP program for families in Brazil, with preliminary work focusing on feasibility and cultural adaptation processes (Mazzuchelli et al., in preparation). Building on this foundation, the current study examines the impacts of this adapted intervention, BrincarLerVIP em Sala, employing a pre-post design. The original program has demonstrated significant positive effects on parent-child interactions and child development outcomes across various contexts (Cates et al., 2016; Ciochetta et al., in press; Mendelsohn et al., 2018; Piccolo et al., 2022; Piccolo et al., in preparation; Weisleder et al., 2016). The Brazilian adaptation preserves the program's core elements while incorporating culturally appropriate modifications and a predominantly remote delivery format to enhance accessibility and sustainability. A previous feasibility study confirmed that BrincarLerVIP em Sala is acceptable, appropriate, and feasible for implementation in Brazilian educational child care centers (Mazzuchelli et al., in preparation), providing the groundwork for assessing its effectiveness.

The present study aims to evaluate the impact of BrincarLerVIP em Sala on parent-child interactions and child developmental outcomes in Brazilian educational child care settings. While evidence-based parenting programs have shown effectiveness in high-income countries, there is limited research examining their impact when adapted and implemented in

low- and middle-income countries (LMICs), particularly within educational settings (Altafim & Linhares, 2016; Pedersen et al., 2019). The present study addresses this gap by examining whether BrincarLerVIP em Sala enhances parent-child interactions, particularly in the context of reading aloud, and promotes child language, cognitive, and social-emotional development. This investigation is particularly significant as it represents one of the few studies examining the impact of an adapted evidence-based parenting program implemented through educational child care centers in Brazil. Furthermore, by evaluating a program that combines remote delivery with institutional support, this study contributes to understanding innovative approaches for scaling up parenting interventions in resource-constrained settings while maintaining program quality and effectiveness (Arriagada et al., 2018; Weisleder et al., 2018).

Theoretical Framework

The theoretical framework for this study integrates Ecological Systems Theory (Bronfenbrenner, 1979) with Sociocultural Theory (Vygotsky, 1978) to explore how the BrincarLerVIP em Sala program promotes responsive parenting, improves parental skills, and strengthens parent-child relationships. This strengths-based, family-centered, and relationship-focused approach is consistent with the frameworks of cultural responsivity and trauma-informed care, making it particularly effective in contexts marked by adversity (Black et al., 2017; Bowlby et al., 1969; Bransford et al., 2000). This approach is crucial because a child's development is often impeded by various risk factors, with poverty being one of the most devastating. Among protective factors, parental responsiveness is the key element with the greatest potential to mitigate these harmful effects. Bronfenbrenner's theory situates these interactions within a broader ecological context by considering the various layers of influence on a child's development (Bronfenbrenner, 1979).

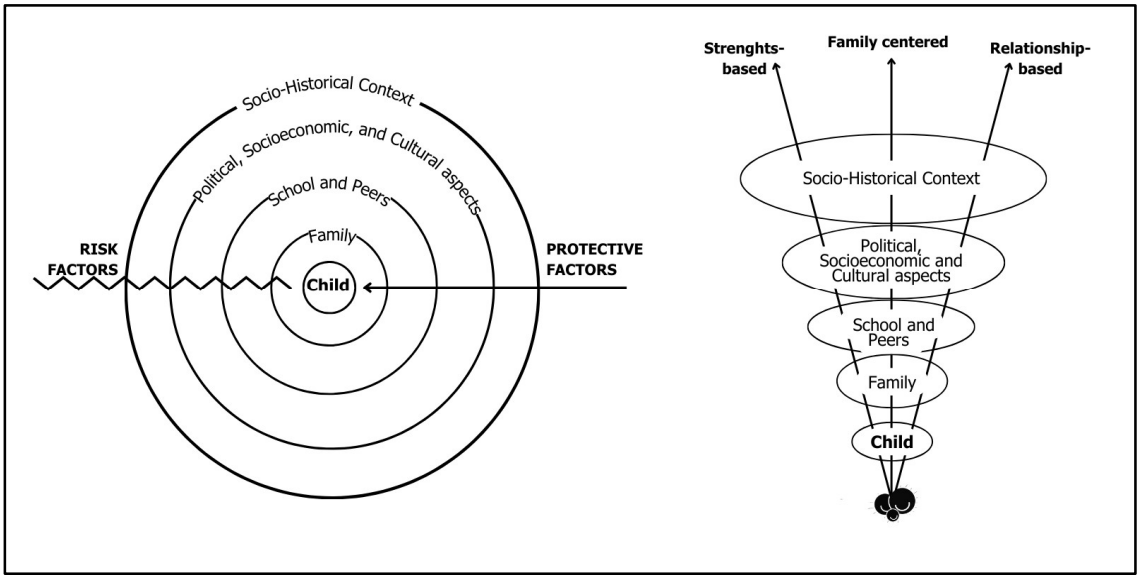
As illustrated in Figure 1, the BrincarLerVIP program fosters responsive relationships and highlights the importance of various environments in which a child is immersed, such as

family and school. Additionally, it is important to consider the significant disparities in language exposure that occur during early childhood among youngsters from different socioeconomic backgrounds and its long-lasting impact on children's development and future academic achievements (Hart & Risley, 1995). BrincarLerVIP recognizes this critical period as an opportunity to address these disparities, emphasizing the urgent need for early childhood programs to bridge this gap.

Moreover, the remote delivery of the program provides an external layer of support that indirectly benefits children by empowering parents and teachers. The program's adaptation to the LMICs cultural and socioeconomic realities ensures its relevance and effectiveness, while its impact over time considers the lasting effects on Early Relational Health and overall child development. Vygotsky's Sociocultural Theory complements this by focusing on the role of social interaction and language in cognitive growth. The BrincarLerVIP program's emphasis on dialogic reading and structured play aligns with Vygotsky's ideas on how learning is facilitated through guided interaction. Parents and teachers play a critical role in supporting children's development by scaffolding them through tasks they cannot accomplish alone. The program's use of cultural tools, such as books and interactive activities, strengthens the parent-child relationship and promotes responsive parenting. By integrating these theoretical perspectives, this study underscores the potential of BrincarLerVIP to counteract the adverse impacts of poverty and promote Early Relational Health through enhanced parental skills and relationships.

Figure 1

Theoretical Framework and PlayReadVIP Approaches



The Current Study

Based on this combined theoretical framework, the current study aims to examine the implementation and impact of BrincarLerVIP em Sala, a program designed to enhance responsive parenting, improve parental skills, and strengthen parent-child relationships. This study will specifically focus on the remote delivery of BrincarLerVIP em Sala through educational child care settings, adapting the PlayReadVIP model to the Brazilian context. Our hypothesis posited that following the intervention, participants would exhibit (1) enhanced parent-child interactions, particularly during shared reading activities, and (2) improved development in children's linguistic, cognitive, and socio-emotional capacities.

By achieving these objectives, the study seeks to provide evidence on the impact and effectiveness of responsive parenting and educational interventions in diverse cultural and socio-economic contexts that can support scalability. The findings will contribute to the understanding of how remote, relationship-based programs like BrincarLerVIP em Sala can be

effectively adapted and implemented in different settings to promote early childhood development and school readiness.

Method

Study Design

A quantitative within-group design with pre- and post-test assessments was employed (Creswell, 2014; Robson & McCartan, 2016). This quantitative method involved administering tests before and after the previously adapted BrincarLerVIP em Sala intervention. The intervention conducted with the families served as the independent variable, while the parental outcomes, including parent-child interaction, together with child development, constituted the dependent variables. The study received approval from the Research Ethics Committee in Human and Social Sciences at the University of Brasília (CEP/CHS/UnB) with the following Certificate for Ethical Appraisal Presentation (CAAE) number 74426223.8.0000.5540.

Participants

The area in São Paulo from which families were enrolled mirrors broader urban economic patterns in Brazil, with unemployment at 16% (Instituto Brasileiro de Geografia e Estatística [IBGE], 2022). About 40% of workers are engaged in informal employment, leading to economic uncertainty (Fundação Sistema Estadual de Análise de Dados [SEADE], 2021). According to the São Paulo Social Vulnerability Index (IPVS), 25.6% of the inhabitants of São Miguel are in a situation of high social vulnerability, particularly in the Jardim Helena District, where 36.5% of the population experiences this condition (Prefeitura de São Paulo, 2022). The centers were selected based on their service provision to vulnerable populations within that region. Initially, 165 families were contacted, with 38 excluded due to non-eligibility criteria (non-fluency in Portuguese or limited program contact), resulting in 127 eligible invited families. Of these, 75 declined participation, leaving 52 families who proceeded to the pretest stage. Following the pretest, 8 families dropped out, reducing the number to 44 families who

entered the intervention phase. The intervention consisted of two PlayReadVIP sessions, during which 2 additional families withdrew after the first session, leaving 42 families to complete the second session. After the full intervention, 1 more family dropped out before the posttest assessment, resulting in a final sample of 41 families who completed the entire study process through the posttest stage. More details about the enrollment and drop-outs can be found in Mazzuchelli et al. (in preparation).

A detailed description of the sample has been previously reported (Mazzuchelli et al., in preparation) and are summarized here for reference. Among the children, the mean age was 39.63 months (SD = 6.01), with 51% being female. A majority (63%) had siblings, and 66% were identified as Black or of mixed racial background. Regarding parental characteristics, 98% of respondents were mothers, with a mean age of 32.23 years (SD = 6.29). Most parents (83%) were married or cohabiting. In terms of educational attainment, 63% had a low level of education, with 41% having completed only high school and 22% having some college education without a degree. Concerning socioeconomic status, the mean monthly household income was R$3,919.26 (SD = 3,422.30), which, based on the February 2024 exchange rate of approximately 1 BRL to 0.2 USD, corresponds to about $783.85 USD (SD = 684.46). For reference, the minimum wage at that time was R$1,320.00 per month, equivalent to approximately $264.00 USD. Food insecurity was reported by 32% of households, and 27% of families were beneficiaries of *Bolsa Família*, Brazil's conditional cash transfer program for low-income families. Access to technology was common, with all participants (100%) reporting WhatsApp usage and 73% having Wi-Fi at home. Screen exposure among children was common, with 75% using cell phones or tablets and 22% starting before six months of age.

Measures

Instruments to assess parenting outcomes and parent-child relationship

Baseline interview. We collected data at baseline related to sociodemographic characteristics. A battery of questions developed by the research team and used in previous studies with similar populations (Mendelsohn et al., 2020; Piccolo et al., 2022; Weisleder et al., 2018) was utilized. The questionnaire was assessed at pre and post. In addition to general and sociodemographic information, this interview included diverse parenting outcomes, health indicators, child behavior, parental involvement in promoting development, and family environment measures, described below.

Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1996). The Edinburgh Postnatal Depression Scale (EPDS) is a standard 10-item screening instrument measuring symptoms of maternal postnatal depression validated for the Brazilian population (Santos et al., 2007). Total scores between 10 and 12 indicate possible postpartum depression and a score of 13 or higher indicates a fairly high likelihood of postpartum depressive symptomatology.

Socolar discipline survey (Socolar et al., 2004). Physical punishment scores were based on the physical punishment subscale of the Socolar Discipline Survey, which includes two questions regarding the frequency of spanking and of slapping the child's hand during the previous 3 months. Questions were translated previously and used in Brazilian studies (Piccolo et al., 2022; Weisleder et al., 2018) with Cronbach's α in 0.65 (Piccolo et al., 2022).

Parental Self-Efficacy Scale. (Črnčec et al. 2008; Johnston & Mash, 1989) This construct is designed to assess parental self-efficacy through questions adapted from two scales about how parents feel in their home environment. Respondents are asked to answer each question using a scale from 1 to 4, where 1 means "Strongly Agree," and 4 means "Strongly Disagree." The questions were previously used in Brazilian samples (Piccolo et al, 2022a; Weisleder et al, 2018).

StimQ$_2$

Parent interview to assess cognitive stimulation including four subscales: (1) READ (frequency and quality of reading interactions), (2) PIDA (caregiver teaching and play activities), (3) PVR (caregiver-child verbal interactions), and (4) ALM (availability of learning materials at home). Adapted to Brazilian Portuguese by the study team, the StimQ$_2$ in Portuguese is in accordance with the instrument translation policy and guidelines (Cates et al., 2023). In samples from the United States, the measure exhibits robust psychometric properties, demonstrating satisfactory internal consistency across its versions: α=.85 for the Infant version, α=.83 for the Toddler version, and high reliability for preschool measures, with Cronbach's alpha coefficients exceeding .80. Reliability analyses of subscores indicate the added value of reporting these scores, as the majority exhibit a lower proportion reduction in mean squared error (PRMSE) compared to the total score, suggesting good reliability for individual subscales (Cates et al., 2023). In a previous study conducted in Brazil, test-retest reliability among control families was reported as r=0.45 for StimQ$_2$ Total, r=0.32 for READ, r=0.45 for PVR, and r=0.35 for PIDA, all with $p < .001$ (Weisleder et al., 2018).

ACIRI

We assessed parent-child interactions during shared book reading using the ACIRI (Adult-Child Interactive Reading Inventory) (DeBruin-Parecki, 2007). Coders, blinded to hypotheses, rated dyads on 12 literacy behaviors related to three key areas: (1) enhancing attention to text, (2) promoting interactive reading and supporting comprehension, and (3) using literacy strategies. The study team trained coders to ensure reliability. This instrument has demonstrated good internal consistency in previous studies conducted in Brazil, with a Cronbach's alpha of $\alpha \geq .86$ (Weisleder et al., 2018). The coders were trained in reliability. After study completion, 5% of the videotapes were recorded by other researchers from the team to establish a gold standard for inter-rater reliability. In the US population, good internal

consistency was observed ($\alpha \geq 0.8$). However, this has not been previously validated in Brazil. IRR was calculated using a 2-way mixed, consistent, single-measure intraclass correlation coefficient (ICC). ICC adult scores =0.64 ICC child scores =0.47. The instrument has shown good internal consistency in the US ($\alpha \geq .8$) and Brazil's current sample ($\alpha \geq .86$). (Mendelsohn et al., 2020)

Instruments to assess child development

Peabody Picture Vocabulary Test (Tiberio, 2017): assesses the understanding of auditory receptive vocabulary. It consists of 5 training items and 125 test items, and in each item the subject must select the picture that best represents the word heard from the four pictures presented. In a Brazilian population, the test demonstrates high reliability as a measure of receptive vocabulary. Overall, the test's internal consistency supports its validity as a tool for evaluating vocabulary development in children and adults alike, making it a valuable resource in both educational and clinical settings (Tiberio, 2017).

Word and Pseudoword Repetition Test (Seabra & Dias, 2012). Brazilian instrument that assesses the phonological capacity of short-term memory. It consists of 16 items, 8 for word repetition and 8 for pseudowords, ranging from 2 to 5 items that are pronounced by the examiner for the child to repeat. The total score was the sum of the correct items (raw score).

IDADI-Breve (Mendonça Filho et al., 2021). The Dimensional Inventory of Child Development Assessment - Brief, developed for Brazilian populations, is a multidimensional instrument designed to assess the development of children from 4 to 72 months through parental reports. It covers seven key developmental domains: Cognitive, Gross Motor, Fine Motor, Receptive Communication and Language, Expressive Communication and Language, Socioemotional, and Adaptive Behavior. It can be administered online, either individually or in groups, and can be conducted in-person or remotely. The analysis was based on raw scores.

Preschool Self-regulation Assessment (PSRA) (Smith-Donald et al., 2007). PSRA is a structured tool to evaluate preschoolers' self-regulation in emotional, attentional, and behavioral domains. It includes tasks and assessor reports to capture children's impulse control and compliance. Psychometric evaluations show good reliability, with high interrater reliability and internal consistency for constructs from factor analyses. Evidence supports concurrent validity, with significant correlations between PSRA scores and children's social competence, behavior problems, and early academic skills, marking it as viable for field-based research in early childhood settings. It was used previously in Brazilian studies (Piccolo et al., 2022a; Weisleder et al., 2018)

Procedures

The BrincarLerVIP em Sala program was implemented using a pre- and post-test design in two daycare centers located in a socioeconomically disadvantaged area of São Paulo. Graduate-level professionals, blinded to hypotheses, administered interviews and tests to the parents, children, and teachers. After obtaining approval from the Research Ethics Committee participants (parent-child dyads) were invited from daycare in São Paulo, Brazil. Pre- and post-intervention assessments were also performed. The intervention was led by the principal researcher with the support of research assistants, while the training protocols were managed by the research team.

The two daycare centers involved in the study followed the same curriculum and pedagogical guidelines. The intervention was implemented over three months under the supervision of a principal researcher. At the end of the intervention period, a post-test assessment was conducted using the same instruments as those in the pre-test. Research assistants (undergraduate psychology students) conducted assessments under supervision while remaining blind to study design and hypotheses. Different assessors administered each component (parent interviews, observations, and child assessments), with distinct personnel

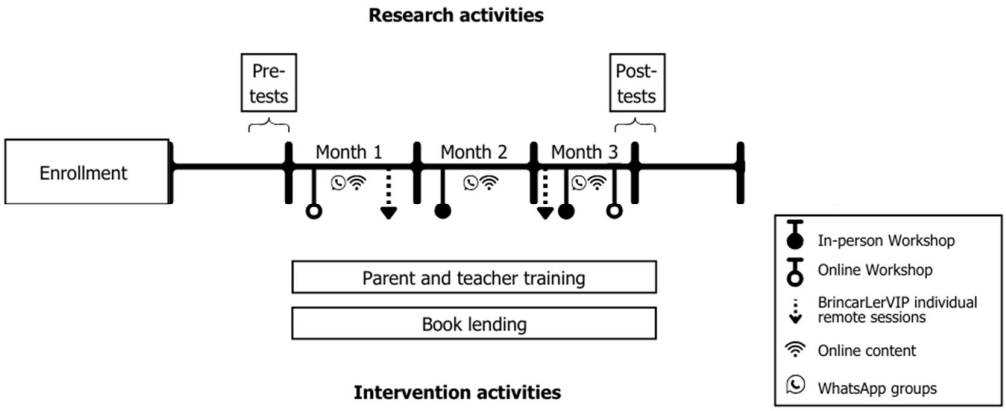
assigned to pre-test and post-test phases to maintain measurement independence and minimize bias. Interviews took place online or in rooms provided by the children's childcare facilities and lasted approximately 50 minutes.

BrincarLerVIP em Sala Implementation

The twelve-week intervention in Brazil involved sessions and workshops that were principally conducted remotely, with in-person activities to facilitate material distribution and engage parents by meeting them at school. The intervention was scheduled at convenient times to maximize participation and engagement. BrincarLerVIP comprises several components described in Table 1.

Figure 2

BrincarLerVIP em Sala Research and Intervention Activities



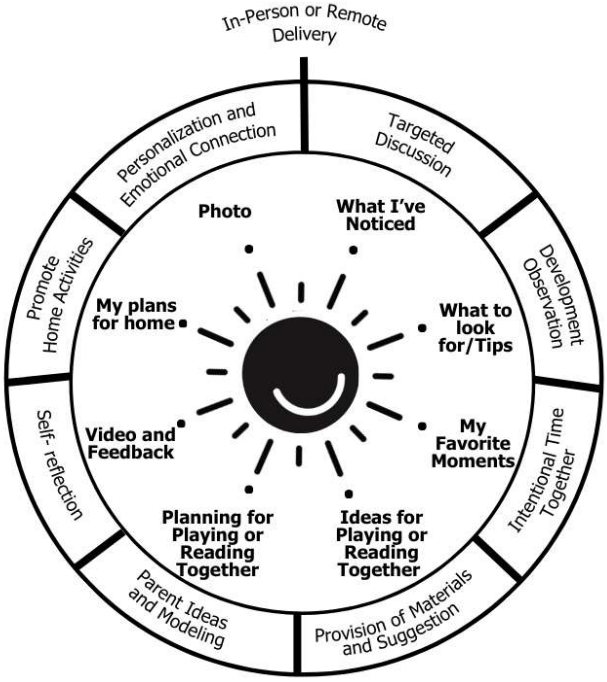
BrincarLerVIP Individual Remote Sessions. Sessions were carried out with each family member by a trained PlayReadVIP program specialist. Before the start of each session, an individualized protocol document known as the parent guide is prepared by the specialist, tailored to the corresponding age of the child. This parent guide was structured to ensure that the parent felt a sense of proprietorship over the process and provided structure for the visit (Mendelsohn et al., 2021). The document records all stages of the session and as a final moment

of the session, a personalized copy is provided to the parents allowing them to revisit and access the content at any time.

Two rounds of sessions were held after the children received the learning material: one in the first month with a book, and the other in the last month of the intervention with a toy. The meeting was conducted privately via Google Meet, ensuring confidentiality and a secure online environment for all the participants. Each session lasted approximately 35 minutes and followed the PlayReadVIP standardized protocol. The session includes eight unique components: What I've noticed; What to look for/tips; My favorite moments; Ideas for playing or reading together; Planning for playing or reading together; Video and feedback; My plans for home; and Photo. The steps and their main objective are illustrated in Figure 3 and detailed below.

Figure 3

PlayReadVIP Session



What I've noticed. This aims to enhance parental self-reflection and encourage active involvement in their child's growth. Observations made by parents about their child's development are recorded in the parent guide. The coach engages in a targeted discussion about integrating reading, playing, and talking with the child into daily routines.

What to look for/tips. The coach provides age-appropriate developmental guidance and information.

My favorite moments. The coach encourages parents to recall enjoyable activities with their child from the past week or previous visit, focusing on reading, playing, and daily interactions.

Ideas for playing or reading together. Toys or books are donated to families to ensure they had age-appropriate learning materials that promoted interactive and playful family moments. Suggestions are offered on how to employ these instructional materials to foster children's early literacy abilities and comprehensive development.

Planning to play or read together. Parents are encouraged to contribute their own ideas on how to utilize this material. These ideas are acknowledged and refined to create a tailored approach that meets the specific needs of the child. In the next step, parents are encouraged to implement the finalized idea in practice.

Video and Feedback. A three-minute video of the parent-child interaction using learning materials, such as books or toys, is captured. This brief recording captures the parent applying recommended strategies while engaging with their child, serving as a foundation for the feedback process. After recording, the coach reviews the footage with the parent and provides feedback based on a structured checklist. This feedback focuses on the positive behaviors demonstrated by parents in three key areas: responsiveness to the child, encouragement techniques, and structuring of symbolic play or imagination during reading activities. The coach also notes the child’s reactions to parental invitations for engagement.

This video serves as a powerful tool for reinforcing responsive parenting and promoting self-reflection. During the video review, coaches and parents discuss successful interactions, highlighting positive aspects while gently encouraging the adoption of additional strategies for improvement. To stimulate meaningful reflection, coaches may pose specific questions such as “What was your favorite part of the video?” This process teaches parents to closely observe their interactions and understand their child’s reactions, reinforcing learning in a supportive environment. Parents receive copies of the videos to review at home, which helps them implement strategies discussed during sessions and share these experiences with family members. The video feedback approach is central to the program as it facilitates practical demonstration, reflection, and discussion beyond theoretical instruction. This comprehensive method empowers parents to observe their interactions objectively and develop ongoing routines that promote engagement during everyday activities, ultimately enhancing opportunities for their child's developmental growth.

My plans for home. The session culminates in planning, where the specialist and family discuss how to integrate activities into their daily routine, and the significance of reading, playing, and talking daily, ideally with screens turned off.

Photography. At the end of each session, a family photograph is taken to capture the shared experience and strengthen emotional ties to the program. This photograph is included in the personalized parent guide.

Distribution of Learning Materials. The learning materials consist of toys and books provided to the parents and children during their BrincaLerVIP sessions. These materials, new and in their original packaging, are designed to stimulate interactions and shared activities between parents and children. The Parent Guide offers suggestions on how to use these materials effectively, encouraging parents to engage in a dialogue about their experiences and to model positive behaviors when introducing the materials to their child. The goal is to create

an interactive and enjoyable learning experience that promotes bonding and developmental growth.

Book Lending. Similarly with previous study (Weisleder et al., 2018) a weekly book-lending system was introduced to foster family involvement in shared reading activities. Families were invited to borrow a book from the daycare library to take home and exchange for a new one each week. To facilitate the process, teachers were instructed to select a set of books and make them available in their classrooms for families to pick up during dismissal or send in the children's backpacks to families that did not pick up their children.

Traveling Book. This strategy aims to support family reading and to provide access to different books, as studied previously in Brazil (Weisleder et al., 2018). It allows children to take home a book and a record notebook, both placed in a special bag, as an honor and exciting event. At home, parents are instructed to read the book to the child, who then documents the story in the notebook through drawings or writing. This strategy also aimed to reach families who were not picking up books, as it was an activity sent home by the teachers, with the goal of fostering fondness for reading, enhancing children's development, and encouraging children to engage their parents in the reading process.

WhatsApp Group. WhatsApp, a widely accessible and popular cross-platform messaging application in many LMICs (Skeen et al., 2023), was used as a component. In Brazil, WhatsApp is not only the most frequently used platform for daily communication but also central to the cultural practice of participating in group chats. Given this context, three groups were formed using this application: one for each child care center and their respective families, and one specifically for the teachers. Teachers were also given the option of joining family groups, if they desired. These groups were designed to facilitate communication and exchange among all participants and specialists, fostering a sense of belonging while providing opportunities for interaction, experience sharing, and resolution of any doubts.

Online Content. Information and suggestions for activities were sent through WhatsApp Groups, serving as a conduit for sharing how to engage with children through reading, playing, and conversation, thereby making the experience both interactive and educational.

Parental Workshops. These moments were planned to provide information and guidance and promote the observation of positive interaction models. Four meetings in each center, two in-person and two remote, lasting 40 minutes, offered parents the opportunity to talk about playing and reading with their children. In two of these four, volunteers were invited to read to their children while the whole group could observe and discuss. Parents were trained to engage in dialogic reading, fostering conversations before, during, and after reading sessions. They were taught to repeat and add information to what the child said, promoting elaborative language. Additionally, parents were encouraged to maintain physical proximity and positive behaviors during activities, enhancing parent-child interaction. These interventions aimed to enhance parent-child interactions, particularly during reading activities, and promote a supportive and enriching environment for children's cognitive-linguistic and socioemotional development, as tested previously in Brazilian families (Piccolo et al., 2022a; Weisleder et al., 2018).

Data Analysis

All statistical analyses were performed using SPSS version 21 software (SPSS Inc., Chicago, IL, USA). Prior to conducting statistical analyses, the Shapiro-Wilk test was employed to verify the normal distribution ($p>0.05$) of the raw dataset (Shapiro & Wilk, 1965). Descriptive statistics were utilized to compute the means and standard deviations. Paired sample t-tests were conducted to evaluate the differences between pre- and post-intervention measurements. The threshold for statistical significance was established at $p<0.05$. To control for multiple comparisons, a false discovery rate of 10% was implemented (i.e., 1 in 10

statistically significant tests expected to be false positive) (Benjamini & Hochberg, 1995; Storey, 2002). Effect sizes were estimated using Cohen's *d,* with values interpreted as small (d=0.2), medium (d=0.5), and large ($d\geq$0.8), as outlined by Cohen (1988).

Results

Effects of BrincarLerVIP em Sala on Parenting Outcomes

The comparison of parenting outcomes between pre- and post-test assessments revealed significant improvements across multiple domains. Parental self-efficacy showed a statistically significant increase from pre-test (M=45.24, SD=9.28) to post-test (M=48.80, SD=5.05), p=.02, with a small effect size (d=0.37). Similarly, interactive reading (ACIRI) demonstrated a significant increase from pre-test (M=38.02, SD=13.24) to post-test (M=43.68, SD=10.89), p=.02, with a small effect size (d=0.36). In contrast, depressive symptoms (EPDS) showed no statistically significant change from pre-test (M=7.95, SD=6.05) to post-test (M=7.05, SD=4.46), p=.11, d=-0.20.

Regarding discipline practices, physical punishment decreased slightly from pre-test (M=3.56, SD=1.05) to post-test (M=3.54, SD=1.09), p=0.36. The estimated effect size for the change in discipline scores was small (Cohen's d = 0.017). The $StimQ_2$ Total score showed a substantial improvement, increasing from pre-test (M=49.17, SD=16.99) to post-test (M=59.83, SD=12.46), p<.001, with a large effect size (d=0.86), suggesting meaningful gains in parenting stimulation practices. Similarly, the post-test increases in total ACIRI scores (M=53.56, SD =17.48) was statistically significant, p<.001, with a large effect size (d=1.02), indicating substantial improvements in interactive reading behaviors.

Table 2

Comparison of Parenting Outcomes

		Mean (SD)	*p**	*Cohen's d*
STIMQ$_2$ Total	*Pre test*	*49.17 (16.99)*	-	
	Post Test	*59.83 (12.46)*	*<0.001*	*0.860*
Parental self-efficacy	*Pre test*	*45.24 (9.28)*	-	
	Post Test	*48.80 (5.05)*	*0.017*	*0.370*
Depressive Symptoms (EPDS)	*Pre test*	*7.95 (6.05)*	-	
	Post Test	*7.05 (4.46)*	*0.108*	*-0.200*
Interactive reading (ACIRI)	*Pre test*	*38.02 (13.24)*	-	
	Post Test	*43.68 (10.89)*	*0.020*	*0.360*
Physical punishment	*Pre test*	*3.56 (1.05)*	-	
	Post Test	*3.54 (1.98)*	*0.047*	*0.017*

**p-value corrected with Benjamini-Hochberg procedure*

Effects of BrincarLerVIP em Sala on Child Outcomes

The implementation of *BrincarLerVIP em Sala* was associated with significant improvements in child developmental outcomes. Phonological short-term memory showed a significant increase from pre-test (M = 2.80, SD = 2.26) to post-test (M=4.39, SD=2.91), $p<.001$, with a large effect size (d = 0.77). Similarly, receptive vocabulary demonstrated a significant improvement, increasing from pre-test (M=40.00, SD=18.10) to post-test (M = 53.56, SD=17.48), $p<.001$, with a large effect size (d=1.02). Regarding behavioral outcomes, externalizing behaviors (PSRA) showed a slight, non-significant increase from pre-test (M = 38.32, SD=4.20) to post-test (M=39.78, SD = 4.11), p=.07, with a small effect size (d = 0.25). In the *Idadi* developmental domains, cognition improved from pre-test (M=10.34, SD=3.27) to post-test (M=11.39, SD=2.66), although non-significant with p=.08, with a small effect size

(*d*=0.23). Socioemotional skills demonstrated an increase from pre-test (M=11.66, SD=3.18) to post-test (M=12.63, SD=1.87), *p*=.01, with a small effect size (*d*=0.40). Significant gains were observed in language and motor skills. Receptive language increased from pre-test (M=10.61, SD=2.81) to post-test (M=12.17, SD=1.83), *p*<.001, with a medium effect size (*d*=0.63). Expressive language also improved significantly (*p*<.001), with scores increasing from pre-test (M=10.73, SD=3.57) to post-test (M=12.20, SD=3.12), and a medium effect size (*d*=0.53). Motor skills showed marked improvements, with gross motor skills increasing from pre-test (M=9.90, SD=3.35) to post-test (M=12.15, SD=1.93), *p*<.001, *d*=0.72, and fine motor skills increasing from pre-test (M=7.88, SD=3.65) to post-test (M=10.20, SD=2.79), *p* <.001, *d*=0.70. Finally, adaptive behavior demonstrated a significant improvement from pre-test (M=11.46, SD=2.34) to post-test (M=12.37, SD=1.76), *p*<.001, with a medium effect size (*d*=0.48).

Table 3

Comparison of Child Outcomes

Outcome	*Time*	*Mean (SD)*	*p**	*Cohen's d*
Phonological short-term memory	Pre test	2.80 (2.26)	-	
	Post Test	4.39 (2.91)	<.001	0.77
Receptive Vocabulary	Pre test	40.00 (18.10)	-	
	Post Test	53.56 (17.48)	<.001	1.02
Externalizing behavior (PSRA)	Pre test	38.32 (4.20)	-	
	Post Test	39.78 (4.11)	0.07	0.25
Idadi Cognition	Pre test	10.34 (3.27)	-	
	Post Test	11.39 (2.66)	0.08	0.23
Idadi Socioemotional	Pre test	11.66 (3.18)	-	
	Post Test	12.63 (1.87)	<.05	0.40
Idadi Receptive Language	Pre test	10.61 (2.81)	-	
	Post Test	12.17 (1.83)	<.001	0.63
Idadi Expressive Language	Pre test	10.73 (3.57)	-	
	Post Test	12.20 (3.12)	<.001	0.53
Idadi Gross Motor Skills	Pre test	9.90 (3.35)	-	
	Post Test	12.15 (1.93)	<.001	0.72
Idadi Fine Motor Skills	Pre test	7.88 (3.65)	-	
	Post Test	10.20 (2.79)	<.001	0.70
Idadi Adaptive Behavior	Pre test	11.46 (2.34)	-	
	Post Test	12.37 (1.76)	<.05	0.48

**p-value with Benjamini-Hochberg procedure*

Discussion

Findings demonstrate both promising outcomes and areas requiring further attention in the implementation of the BrincarLerVIP em Sala intervention. Analyses reveal significant improvements in several key parenting domains, particularly in areas related to parent-child

interaction and developmental stimulation. A notable strength of the intervention was its impact on parental stimulation practices, as evidenced by the substantial increase in $StimQ_2$ Total scores ($p<.001$, $d=0.86$). This large effect size suggests that parents meaningfully enhanced their engagement in developmentally supportive activities with their children. Similarly, the intervention showed robust positive effects on interactive reading behaviors, with ACIRI scores demonstrating significant improvements ($p<.001$, $d=1.02$). These findings align with previous research highlighting the importance of structured interventions in promoting positive parent-child interactions (Healy et al., 2024)

The modest but significant improvement in parental self-efficacy ($p=.02$, $d=0.37$) suggests that the intervention successfully enhanced parents' confidence in their caregiving abilities. This finding is particularly relevant given the established relationship between parental self-efficacy and positive child outcomes in the literature (Wittkowski et al., 2017). Elevated parental self-efficacy has been consistently associated with adaptive and nurturing parenting environments, contributing to children's social, academic, and psychological well-being. Research indicates that parental self-efficacy predicts parenting functioning, and interventions enhancing parental self-efficacy have demonstrated positive effects on child outcomes. Improving parental self-efficacy is crucial for fostering better parenting practices, which support positive child development outcomes (Wittkowski et al., 2017).

However, several findings are of particular importance. The intervention demonstrated the strongest effects in the domains of children's receptive vocabulary ($d=1.02$) and phonological short-term memory ($d=0.77$), suggesting significant enhancement of fundamental language processing abilities. These large effect sizes are particularly noteworthy given that language skills during early childhood are robust predictors of later academic achievement (Willis & Eddy, 2022). The comprehensive improvements observed across both receptive ($d=0.63$) and expressive ($d=0.53$) language measures further support the

intervention's effectiveness in promoting language development. The sociodemographic context of these findings merits careful consideration. The sample represented a socioeconomically diverse population, with a mean monthly household income of R$3,919.26, and significant proportions experiencing food insecurity (33%) and receiving social assistance (27%). Despite these challenges and even under conditions far from ideal, the results highlight the potential of the adapted version of PlayReadVIP. The high prevalence of technology access (100% WhatsApp usage, 73% home Wi-Fi) shows opportunities for intervention delivery and support. The moderate improvements in socioemotional skills (d=0.40) and adaptive behavior (d=0.48) are promising, though the slight increase in externalizing behaviors, while non-significant (p=.07, d=0.25), warrants attention in future program iterations. The modest improvement in cognition (d=0.23) suggests that additional strategies may be needed to enhance cognitive outcomes more substantially.

Limitations

While the current findings are promising and align with previous research utilizing the PlayReadVIP program, several methodological limitations warrant attention when interpreting these results. The quasi-experimental pre-post design without a control group, combined with a relatively small sample size (n=41) and brief intervention period (12 weeks), makes it difficult to differentiate between changes attributable to the intervention and those that would naturally occur through maturation or development over time, particularly for developmental domains that would be expected to show improvements regardless of intervention during this age period.

Additionally, reliance on parental self-report measures for several outcomes, particularly in the Idadi domains, introduces potential reporting bias. It is important to acknowledge that the improvements observed in these domains may reflect not only actual developmental gains, but also enhanced parental awareness and observation skills, as supported

by previous research (Mazzuchelli et al., in press) and parent interviews indicating increased attention to their children's developmental progress. The observational nature of many of our measures, while providing valuable ecological validity, makes it challenging to disentangle objective developmental changes from shifts in parental perceptions. Future studies should complement these observational measures with more objective assessments to triangulate developmental outcomes, in addition to developing randomized clinical trials with larger sample sizes.

Conclusion

The BrincarLerVIP em Sala intervention demonstrates promising effectiveness across multiple domains, with particularly robust effects on parent-child interaction quality, developmental stimulation, and children's language and cognitive functioning. The intervention's success in enhancing critical developmental domains across a socioeconomically diverse sample suggests its potential scalability, despite varying levels of resource availability among participating families. However, these encouraging findings must be interpreted within the context of important methodological limitations and areas requiring further development.

The mixed results observed across different outcome domains underscore the complexity of implementing comprehensive parenting interventions. While significant improvements were noted in parent-child interactions and children's language and motor skills, opportunities exist for enhancing the program's impact on disciplinary practices and parental mental health outcomes. The high prevalence of early screen exposure among participating children also highlights a crucial area for additional parent education and intervention focus.

These findings contribute to the growing body of evidence supporting structured parenting interventions while simultaneously identifying specific areas for program optimization. Future research employing controlled designs with larger samples will be essential for establishing causal effects and distinguishing between direct developmental

impacts and changes in parental perception and engagement. Additionally, subsequent studies should explore the mechanisms underlying the differential effectiveness across outcome domains and investigate potential moderating factors that may influence intervention success. This deeper understanding will be crucial for refining the program and maximizing its impact across all targeted domains of parent and child development.

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Supplementary Material

Table 1

Psychometric characteristics of the instruments

Construct	*Measure*	*Description*	*Psychometric Properties*
Parenting Outcome			
Cognitive stimulation	*StimQ*	*Parent interview including 3 subscales: (1) READ is used to assess frequency and quality of reading interactions, (2) PVR is used to assess caregiver-child verbal interactions, and (3) PIDA is used to assess caregiver teaching and play activities. Adapted to Brazilian Portuguese by study authors. Scores: total, 0–37; READ, 0–13; PVR, 0–14; PIDA, 0–10*	*In US populations: good internal consistency (Cronbach's α = 0.88), test-retest reliability (ICC = 0.93); correlated with the Home Observation for Measurement of the Environment Inventory (r=0.5–0.6). Not previously validated in Brazil. Test-retest reliabilities among control families in this sample were r = 0.45 for StimQ Total, r = 0.32 for READ, r = 0.45 for PVR, and r = 35 for PIDA; all P <.001.*
Interactive reading	*ACIRI*	*Observation of parent-child dyads sharing a children's book, rated by blind coders on 12 literacy behaviors related to the following: (1) enhancing attention to text, (2) promoting interactive reading and/or supporting comprehension, and (3) using literacy strategies. Coders were trained to reliability. After study completion, 5% of the videotapes were recorded by A.S.L to establish a gold standard for interrater reliability. Raw scores: 0–3*	*In US populations: good internal consistency (α ≥ 0.8). Not previously validated in Brazil. IRR was calculated by using a 2-way mixed, consistency, single-measures intraclass correlation coefficient (ICC). 56 ICC adult scores = 0.64 ICC child scores = 0.47*
Physical punishment	*Socolar discipline surve*	*Physical punishment scores were based on the physical punishment subscale of the Socolar Discipline Survey, which includes 2 questions regarding the frequency of spanking and of slapping the child's hand. Questions translated by study authors. Raw scores: 2–12*	*In US populations: good internal consistency (α ≥ 0.5–0.8). Not previously validated in Brazil. Test retest reliability among control families in this sample was r = 0.27, P < .001.*
Mother Depression	*EDPS*		
Child Outcome			

Receptive vocabulary	*Peabody Picture Vocabulary Test*	*Brazilian adaptation of the Peabody Picture Vocabulary Test.37 A score of 1 is given for each item in which the child correctly identifies the labeled picture (out of 4). Testing stops after 6 incorrect responses in an 8-item block. Total score: 0–125. Standard scores were only available for 3y and older; raw scores were used.*	*High internal consistency (α = 0.89; splithalf reliability = 0.41). Concurrent validity with the Language Development Survey57 (r = 0.36).*
Phonological short-term memory	*Word/ nonword repetition*	*Adapted from English by Brazilian investigators; includes 20 word items and 20 nonword items. Item scored as correct if child repeats a series of words/nonwords in the presented order. Difficulty increases with list length. One point is given for each correct response; testing stops after 2 consecutive incorrect responses. Total score: 0–40*	*High internal consistency (α = 0.83; splithalf = 0.83); test-retest reliability (r = 0.73). Concurrent validity with tests of auditory (r = 0.60) and visual working memory (r = 0.49).*
Child developmental	*IDADI Breve*		
Preschool self-regulation	*PSRA*		

Manuscript 4 - From Primary Care to Classrooms: A Pilot Study of PlayReadVIP with Brazilian Preschool Teachers[5]

[5] This manuscript is prepared for submission to the peer-reviewed journal Early Education and Development, and is the fourth of four manuscripts prepared for a journal-ready doctoral dissertation.

Abstract

Early childhood experiences shape cognitive, language, and socio-emotional development, with high-quality adult-child interactions impacting developmental trajectories. In Brazilian educational contexts, where socioeconomic disparities affect access to early literacy resources, interventions promoting responsive interactions offer a promising approach to supporting child development at scale. This pilot study evaluated the adaptation and implementation of PlayReadVIP—an evidence-based program for pediatric primary care settings—into a classroom-based intervention (BrincarLerVIP em Sala) for Brazilian preschool teachers. The research assessed the feasibility of adapting the program for classroom use and examined its impact on teacher-child interactions. Fourteen preschool teachers from public early childhood education centers in São Paulo participated in the 12-week intervention. The adapted program maintained the core principles of a video feedback intervention with strength-based reviews. Adaptations included addressing classroom implementation challenges and strategies, incorporating teacher training, distributing implementation materials, video-recording components, and classroom implementation strategies. Using a pre-post design, outcomes were measured via an adapted $StimQ_2$ questionnaire for teachers; the adult section of the Adult-Child Interactive Reading Inventory; and a social validity questionnaire. Results showed significant improvements in $StimQ_2$-Teachers scores from pre-intervention (M=86.79, SD=21.36) to post-intervention (M=122.86, SD=20.19), with notable increases across all subscales, particularly in learning materials (d=2.05) and reading (d=1.36). Analysis of adapted ACIRI scores revealed an improvement in the quality of teacher-child interactions during reading activities between the first session (M=18.32, SD=7.35) and the second session (M=21.79, SD=8.62). Qualitative feedback indicated enhanced teacher awareness of interaction quality, observed improvements in children's

engagement, and potential transfer to home environments, although implementation challenges were noted. The findings suggest that the adapted intervention represents a promising approach for enhancing early literacy environments in Brazilian preschools, with implications for scalable interventions in similar contexts.

Keywords: PlayReadVIP, dialogic reading, early childhood development, teacher training, responsive interactions.

Early childhood experiences fundamentally shape cognitive, language, and socio-emotional development, with substantial evidence indicating that high-quality interactions between adults and children significantly impact developmental trajectories (Shonkoff & Phillips, 2000). Dialogic reading—an interactive shared reading approach where adults engage children as active participants through open-ended questions and responsive conversation—has emerged as a particularly effective strategy for promoting language acquisition, vocabulary development, and early literacy skills (Mol et al., 2008; Whitehurst et al., 1988), as well as reading comprehension, especially when questions are focused on relevant dimensions of the story (e.g., Flores et al., 2014). Research demonstrates that when consistently implemented, dialogic reading (DR) can narrow developmental gaps for children from diverse socioeconomic backgrounds, potentially mitigating educational inequalities (Zuckerman, 2009).

In Brazil, where significant disparities in access to early literacy resources exist across socioeconomic strata (UNICEF, 2023), interventions that promote responsive adult-child interactions around books represent a promising approach to supporting early childhood development at scale (Weisleder et al., 2018; Mazzuchelli et al., in preparation; Mendelsohn et al., 2020). The importance of these interventions is even more critical considering that the first years of life constitute a fundamental period for brain development and the establishment of foundational skills that will influence children's future academic and social outcomes (Black et al., 2017; Shonkoff et al., 2012).

Despite the recognized importance of responsive interactions in early child development, significant barriers limit its widespread implementation in Brazilian educational contexts (Instituto Brasileiro de Geografia e Estatística [IBGE], 2023). Among these, the varying quality of educational services stands out, with centers in low-income areas often struggling with limited

resources, high child-to-teacher ratios, and insufficient parental engagement opportunities (Campos, 2013; Mezzalira & Guzzo, 2019). Limited professional development opportunities for early childhood educators in evidence-based language promotion strategies represent another key obstacle (Evans & Kosec, 2012).

While various interventions have been developed to promote DR in home environments or healthcare settings, few have been systematically adapted for classroom implementation in Brazilian preschools, where a single educator may interact with 20-30 children daily (Bhering, 2024). Additionally, the literature reveals a notable gap regarding the adaptation of programs originally designed for clinical or home-based settings to educational environments, particularly in middle-income countries where resource constraints may affect implementation fidelity (Sousa & Sousa, 2021; Fernandes et al., 2023; Rodrigues et al., 2021). This gap is particularly significant given that preschool teachers represent a potentially powerful channel for disseminating evidence-based practices that can reach large numbers of children and, indirectly, their families (Campos, 2013; Wright et al., 2023). Such interventions are especially relevant in the Brazilian context, where social and economic inequalities significantly impact child development outcomes (Marturano & Elias, 2016).

The PlayReadVIP program was originally developed as a brief intervention implemented in pediatric primary care settings to promote responsive parent-child interactions and dialogic reading practices (Mendelsohn et al., 2011). The theoretical foundation of PlayReadVIP draws from Vygotsky's sociocultural theory, emphasizing the role of scaffolded interactions in supporting children's movement through the zone of proximal development, as well as attachment theory's emphasis on responsive caregiving (Bowlby, 1969; Vygotsky, 1978). Originally named Video Interaction Project (VIP), the program incorporates video-recorded interactions between parents

and children around shared playing and reading activities, followed by guided reflection facilitated by trained coaches. Evaluations of the original program have demonstrated positive impacts on parent-child interactions, home literacy environments, and children's language development, particularly for families from lower socioeconomic backgrounds (Mendelsohn et al., 2011; Cates et al., 2016). Adapting the PlayReadVIP program for implementation in Brazilian preschool classrooms represents a strategic opportunity to leverage existing educational infrastructure to promote early language and literacy development.

While the original program targets individual parent-child dyads, a classroom adaptation enables significantly broader reach, with potential impacts extending to multiple children simultaneously. Furthermore, teachers in Brazil are positioned as respected knowledge authorities within communities, potentially enhancing the program's ability to influence home literacy practices through teacher-parent communication channels (Campos & Vieira, 2021). Teachers' status in Brazil varies across regions and socioeconomic contexts. Research indicates that in rural and lower-income areas, teachers often hold significant social capital and are respected knowledge authorities (Campos & Vieira, 2021). Studies on teacher professionalization (Gatti, 2010), and family-school relationships in Brazil (Campos & Vieira, 2021), show that despite challenges in urban centers, many communities still respect teachers as educational experts. The respect for educators is not solely dependent on their academic qualifications or initial training, but is also a reflection of the social and cultural contexts in which they operate (Gatti, 2010). This dynamic could be used to strengthen home literacy initiatives involving teachers to support families and children, especially where formal education is valued as a means for social mobility (Campos & Vieira, 2021).

Teacher role in the post-pandemic scenario

The COVID-19 pandemic significantly transformed educational environments, affecting the role of teachers in early childhood education in Brazil. Rather than introducing entirely new phenomena, the pandemic acted as a catalyst that accelerated existing trends and highlighted long standing systemic challenges (Campos & Vieira, 2021). During the pandemic, early childhood educators experienced a substantial increase in their workload, with 62% reporting significantly longer working hours, leading to considerable stress (Coutinho et al., 2020). This intensification reflected pre-existing systemic pressures amplified by the crisis. Teachers faced rapid transitions to remote instruction with minimal preparation either on their part or on the part of families, forcing them to demonstrate remarkable adaptability despite little prior experience with digital education methods (Campos & Vieira, 2021; Vieira & Falciano, 2021).

The pandemic context intensified teachers' dual role as both academic instructors and providers of psychosocial support. Educators functioned as emotional anchors for students experiencing isolation, while managing their own domestic responsibilities (Coutinho et al., 2020). This was particularly challenging for early childhood educators, predominantly women with additional family caregiving responsibilities, creating significant strain, especially when compounded by inadequate technological resources and infrastructure (Coutinho et al., 2020).

Brazilian teachers adopted an expanded mediating function between educational institutions and home environments, including greater engagement with families and community support that gained heightened significance during the crisis (Campos & Vieira, 2021). Educators frequently extended their professional attribution to address the needs of vulnerable populations, mitigating socioeconomic challenges that threatened educational continuity. Many educators experienced a lack of support from employers, including inadequate psychological assistance and

insufficient training for digital tool use (Coutinho et al., 2020). Municipal government actions often reflected ineffective resource allocation, exacerbating existing vulnerabilities in the early childhood education sector (Vieira & Falciano, 2021).

The pandemic rendered visible the profound educational inequities that characterize Brazilian society. Teachers witnessed firsthand the disparate learning conditions among their students, with socioeconomic status determining access to technological resources (Campos & Vieira, 2021). This situation was particularly challenging when organizing materials for special education students (Coutinho et al., 2020). Professionals from private and contracted institutions were disproportionately affected, often working in unsuitable environments (Coutinho et al., 2020).

The pandemic did not fundamentally alter the trajectory of teaching in Brazil but accelerated and intensified existing developmental patterns. The multifaceted role of educators represents not a pandemic-specific anomaly but the continuing evolution of teaching within Brazil's complex social and educational landscape (Campos & Vieira, 2021). These findings underscore the fragility of teachers' working conditions in early childhood education, necessitating urgent policy interventions to improve the educational experience in the post-pandemic scenario (Vieira & Falciano, 2021).

The adaptation addresses a critical need for sustainable and scalable interventions that can function effectively within the constraints of the Brazilian educational system, where resource limitations often complicate the implementation of intensive one-on-one interventions. By empowering teachers as mediators of dialogic reading practices, the adapted program—BrincarLerVIP em Sala—aims to create a multiplicative effect, potentially transforming both classroom and home literacy environments.

An important dimension that warrants consideration in this adaptation is the potential influence of PlayReadVIP on teachers' psychological well-being. In contexts where education professionals face overwhelming workloads and frequently encounter feedback environments that emphasize errors or omissions, interventions that foster self-reflection and strengths-based approaches may offer valuable support. Teacher characteristics, including their mental health and psychological resources, constitute a critical aspect of structural quality in early childhood education programs that ultimately influences process quality—the nature and richness of daily interactions with children (Yoshikawa et al., 2013). In Brazilian educational settings, where educators often navigate high workloads, limited resources, and inadequate compensation, addressing teacher well-being represents a crucial yet frequently overlooked component of quality improvement efforts (Yoshikawa et al., 2018).

The Current Study

The adaptation of PlayReadVIP for classroom environments presents an opportunity to explore how creating spaces for positive self-assessment and strengths-based feedback might not only enhance dialogic reading practices but also contribute to teachers' professional satisfaction and resilience, potentially bolstering their capacity for quality interactions with children. This study aimed to adapt the PlayReadVIP program, originally developed for pediatric primary care settings, into a preschool classroom intervention called BrincarLerVIP em Sala. The research sought to: (1) To adapt the PlayReadVIP program for classroom settings and evaluate its feasibility in Brazilian preschools; and (2) To assess preliminary results of the adaptation by measuring changes in teacher-child interactions.

The central hypothesis was that teachers trained in the BrincarLerVIP em Sala program would demonstrate significant improvements in DR practices and responsive interactions with

children, as measured by adapted assessment tools. Specifically, this study addressed the following research questions: (a) Were the adaptations made to implement PlayReadVIP in Brazilian preschool classrooms effective?; (b) What is the feasibility of implementing the adapted program (BrincarLerVIP em Sala) with preschool teachers in Brazil?; (c) What preliminary changes in teacher-child dialogic reading practices and responsive interactions can be observed following implementation?

Through this adaptation, we not only modified the PlayReadVIP program for remote delivery but also integrated it into the childcare setting for the first time, positioning teachers as key facilitators of the intervention (Wright et al., 2023; Campos, 2013). To support these objectives, the intervention provided teachers with comprehensive training that mirrored the approach used with families, including instructional cards, informational materials, pamphlets, videos, and individualized feedback sessions. By implementing and assessing the impact of BrincarLerVIP em Sala in school settings, this research aims to highlight the critical role teachers can play in supporting responsive interactions, particularly in contexts where resource constraints may affect implementation fidelity (Fernandes et al., 2023; Rodrigues et al., 2021; Sousa & Sousa, 2021). The findings will contribute to understanding how relationship-based programs like BrincarLerVIP em Sala can be effectively adapted and implemented in educational settings to promote early childhood development, potentially creating a more sustainable model for addressing developmental disparities in Brazilian educational contexts.

Method

Study Design

This pilot study employed a pre- and post intervention design to evaluate the adaptation and implementation of the PlayReadVIP program (renamed BrincarLerVIP em Sala) in Brazilian

preschool classrooms. The study was conducted over a 12-week period in 2024 in the outskirts of the city of São Paulo, with data collection occurring before and after the intervention to assess changes in teacher practices and perceptions.

Participants

Recruitment and Selection

The study included preschool teachers from Brazilian childcare centers. Inclusion criteria required participants to work directly with preschool-aged children (2–4 years); and demonstrate willingness to participate in the training sessions and implement the activities.

The study recruited 14 preschool teachers from two public early childhood education centers in São Paulo, Brazil. Eligibility criteria included: (1) current employment as a lead or auxiliary teacher in classrooms with children aged 2-4 years; and (2) willingness to participate in all aspects of the intervention and assessment procedures. All participants provided written informed consent prior to enrollment.

Participant Characteristics

The final sample consisted of 14 teachers (100% female) with a mean age of 34.64 years (SD = 6.43) and an average of 7 years of teaching experience in Early Childhood Education (range: 2-12 years). Educational backgrounds included completed high school, bachelor level and graduate school.

Table 1

Sample Characteristic at Pre-test (N=14)

Characteristics	*Participants, % (N)*
Age, mean (SD)	*32.23 (6.29)*
Position	
Lead Teacher	*57% (8)*
Auxiliar teacher	*43% (6)*
Education Level	
Graduated high school	*27% (11)*
Incomplete Higher Education	*22% (9)*
Higher Education	*32% (13)*
Graduate School	*5% (2)*
Years, mean (SD)	
Since Graduation	*7.16 (3.13)*
In Early Childhood Education	*7.42 (2.82*
At This School	*4.71 (1.98)*

Pedagogical approach and curriculum

The pedagogical approach and curriculum of preschool education in the city where the research was conducted is based on a framework that rejects explicit teaching in early childhood education in favor of more integrative and child-centered practices. This approach is based on the work of educational theorists such as Lev Vygotsky, who emphasizes learning as a social and cultural process; Jean Piaget, who advocates for active knowledge construction through exploration; and the Reggio Emilia perspective developed by Loris Malaguzzi, which values children's multiple forms of expression (Secretaria Municipal de Educação de São Paulo, 2022).

The curriculum incorporates Maria Montessori's principles on prepared environments that foster autonomy, Célestin Freinet's contributions regarding practical experience and free expression, along with the educational perspectives of Paulo Freire and Emilia Ferreiro. This theoretical foundation guides an educational model that advocates for children to become "protagonists of their own learning process" in ways that respect individual differences and

contexts (Secretaria Municipal de Educação de São Paulo, 2022). The curriculum aligns with national guidelines such as the National Common Curricular Base (Base Nacional Comum Curricular) (Brasil, 2017), and the National Curricular Guidelines for Early Childhood Education (Diretrizes Curriculares Nacionais para a Educação Infantil) (Brasil, 2010). The document highlights that the environment needs to permit children to construct their own knowledge. It also states that learning is a personal construction mediated by interactions with the environment and other children (Secretaria Municipal de Educação de São Paulo, 2022).

Intervention Development and Description

Adaptation Process

The adaptation of the PlayReadVIP program into BrincarLerVIP em Sala for classroom use followed the systematic five-step process outlined in the PlayReadVIP Adaptation Manual. During the Pre-Exploration phase, the research team engaged with the PlayReadVIP National Center team to discuss the proposed classroom adaptation for the Brazilian context, timeline, and decisions involved. In the Exploration phase, an Adaptation Team was formed to determine the adaptation scope by identifying the needs to be addressed for classroom implementation. The team examined the original PlayReadVIP program components, core principles, and implementation strategies to identify elements suitable for classroom adaptation. The Preparation phase involved identifying that the adaptation required both cultural and context modifications for the Brazilian classroom setting. Following the Ecological Validity Model (Bernal et al., 1995), the team evaluated five factors: cultural relevance, language appropriateness, content suitability, feasibility of implementation, and adherence to evidence-based practices. Materials were translated using Brislin's cross-cultural translation method (Brislin, 1986). In the Implementation phase, the Implementation Team established a timeline, and completed training and onboarding. Materials

were prepared for classroom delivery and workflows were established. The adapted BrincarLerVIP em Sala program was pilot tested in a small-scale classroom setting, with 14 teachers in this study. Feedback was collected from teachers and implementers using measures including a social validity questionnaire to evaluate feasibility, acceptability, and appropriateness.

BrincarLerVIP em Sala Implementation

BrincarLerVIP was initially intended to be facilitated by teachers, who were seen as the ideal intermediaries between the program and parents due to their established relationships. Teachers were designated as mediators between the intervention team and families, responsible for leading workshops with parents and forwarding messages weekly. However, teachers perceived the program as an additional responsibility in addition to their existing workload. Consequently, the researchers themselves took on the responsibility of delivering the program directly to both parents and teachers, ensuring its implementation without overburdening the teaching staff. Therefore while teachers engaged and participated in meetings and sessions, it became clear early on that they would not be as committed to some intervention tasks, such as conducting workshops. This necessitated the reorganization of the proposed approach.

In response to these considerations, we not only adapted the program for remote delivery but also introduced it to a childcare setting for the first time, integrating teachers as participants in the intervention along with the families. The components of the program were:

BrincarLerVIP Individual Remote Sessions. Teachers were invited to participate in two one-on-one remote sessions with a BrincarLerVIP program specialist. Each session, lasting approximately 30 minutes, followed a similar protocol to the PlayReadVIP Standard. Prior to the meetings, interactions between teachers and children were recorded using a freely chosen book as the learning material. These recordings were then sent to a specialist for live feedback during

meetings. The sessions were adapted to meet the needs of an intervention with educators, focusing on pedagogical skills and behaviors that support engagement, respect for children's initiatives, and promotion of instructional information. For example, in the part "What to look for/tips" instead of discussing individual development in a specific age, the teacher's guide included benchmarks for age groups.

Teacher Training. The training consisted of two online meetings and one in-person session during a regular pedagogical meeting, where teachers received a printed pamphlet outlining ten specific ideas for effectively engaging children during classroom reading activities. This training introduced key concepts and strategies to foster effective teacher-child interactions, providing relevant information on child development and shared reading while emphasizing the importance of positive engagement. Teachers learned practical "how-to" approaches for implementing DR techniques to enhance children's language and literacy development. The training sessions were designed to both disseminate knowledge and actively engage teachers, building their confidence in applying these techniques in daily classroom activities.

Whatsapp Group. The teacher group was planned to facilitate communication, exchange, and support among participants, fostering a sense of belonging, provide opportunities for interaction and experience sharing, and address questions or doubts. This structure, utilizing WhatsApp, aimed to leverage the platform's widespread use in Brazil to create an engaging and supportive community within childcare centers.

Online Content. Information and ideas were sent through the Whatsapp Group, serving as a conduit for sharing how to engage with children through reading, playing, and conversation, thereby making the experience both interactive and educational. Some examples of the Online content is in Supplementary Material.

Measures

Sociodemographics

Sociodemographic information was collected through a brief and structured interview administered at the beginning of the study. The interview included questions regarding the child's age, gender, presence of siblings, and racial identification. Teachers provided information on their age, professional position (lead or assistant teacher), educational background, and years of experience in early childhood education, as well as their tenure at the current school. These data were used to characterize the sample and explore potential associations with study outcomes.

Adapted StimQ$_2$ for Educators (StimQ$_2$-Teachers)

The StimQ$_2$-Teachers was adapted from the validated StimQ$_2$ assessment (Cates et al., 2023; Dreyer et al., 1996), which originally measured cognitive stimulation in home environments. StimQ$_2$ is a tool for assessing cognitive stimulation in children's home environments, crucial for developmental outcomes and early academic achievement (Dreyer et al., 1996). It has demonstrated strong psychometric properties across different age versions and has been translated into multiple languages. Recent updates to the instrument (StimQ$_2$) have optimized its length, improved flexibility, and enhanced its relevance in the context of technological advances (Cates et al., 2023).

The adaptation process involved the translation and cultural adaptation comprising several key steps (Wild et al, 2005). It began with the revision of previous translation from Brazilian studies (Weisleder et al, 2018; Mendelsohn et al., 2020; Piccolo et al., 2022). The next step was forward translation, in which the most recent version (StimQ$_2$ Preschoolers) was translated from the source to Portuguese. Reconciliation followed by comparing and merging multiple forward translations into a single version. Backtranslation then translated the new

language version back to the original for comparison, followed by a back-translation review to identify discrepancies and make revisions (Wild et al, 2005).

The final measure consisted of all items across four original subscales: Availability of Learning Materials (ALM; variety of toys), Reading (READ; books / reading activities), Teacher Involvement in Developmental Advance[6] (TIDA; teaching activities) and Teacher Verbal Responsivity[7] (TVR; verbal interactions). The scale was administered to teachers by trained interviewers. Internal consistency in the current sample was good (Cronbach's $\alpha = 0.879$).

Adult-Child Interactive Reading Inventory (ACIRI)

The ACIRI (DeBruin-Parecki, 2007) was used to evaluate the quality of teacher-child interactions during reading sessions.across three domains: (1) enhancing attention to text; (2) promoting interactive reading and supporting comprehension; and (3) using literacy strategies. As the scale is designed for one-by-one interactions, only teacher behaviors were coded. In addition, before the codification by research assistants, blind to initial/final status, there was training to ensure consistency and agreement with the indicators and scores in the group setting. The observed intraclass correlation coefficient of .974 indicates excellent inter-rater reliability of videos independently coded by two raters.

Post-test Validity Questionnaire

A researcher-developed questionnaire assessed teachers' perceptions of the program's validity and impact through 41 items rated on a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree) addressing program relevance, feasibility, and perceived impact (See

[6] In the original $StimQ_2$, this scale is called Parental Involvement in Developmental Advance (PIDA).
[7] In the $StimQ_2$ it is called Parental Verbal Responsivity (PVR).

Supplementary Material). Additionally, five open-ended questions elicited qualitative feedback about implementation challenges, perceived benefits, and suggestions for improvement.

Procedures

Following approval from the Research Ethics Committee in Human and Social Sciences at the University of Brasília (CEP/CHS/UnB)—with the Certificate for Ethical Appraisal Presentation number 74426223.8.0000.5540—the research team initiated contact with two early childhood education centers in São Paulo. After obtaining institutional permission, researchers recruited teachers during staff meetings, collecting baseline data through sociodemographic questionnaires and the StimQ$_2$-Teachers questionnaire. The BrincarLerVIP em Sala program was implemented over a 12-week period, with teachers integrating program components into their regular classroom activities. Implementation was supported through weekly WhatsApp group messages, twice-weekly push message tips, four workshops (two online and two in-person), and two PlayReadVIP sessions. Video recordings of two reading sessions were made at the first and last months of the intervention for ACIRI scoring. At the conclusion of the intervention, researchers re-administered the StimQ$_2$-Teachers questionnaire and collected post-test data, including a final video-recorded reading session and a post-intervention validity questionnaire.

Program Adaptation Outcomes

The adaptation of PlayReadVIP to the BrincarLerVIP em Sala classroom model required several key modifications to the original program. Table 2 summarizes the principal adaptations and the rationale behind each change. The most significant adaptations included: (1) shifting from parent-child to teacher-child interactions; (2) modifying the age-specific benchmarks in the “What I’ve noticed” section of the PlayReadVIP Parent Guide to age ranges in the BrincarLerVIP Teacher Guide; (3) revising the “What to look for and tips” sections to focus on classroom management

strategies and effective interactions within DR contexts (based on the instructional material "10 tips" which was developed by the research team based on the PlayReadVIP Manual); and (4) developing brief instructional materials including text messages, short videos, and tips that were delivered online as push messages and as printed instructional pamphlets distributed and discussed during in-person workshops.

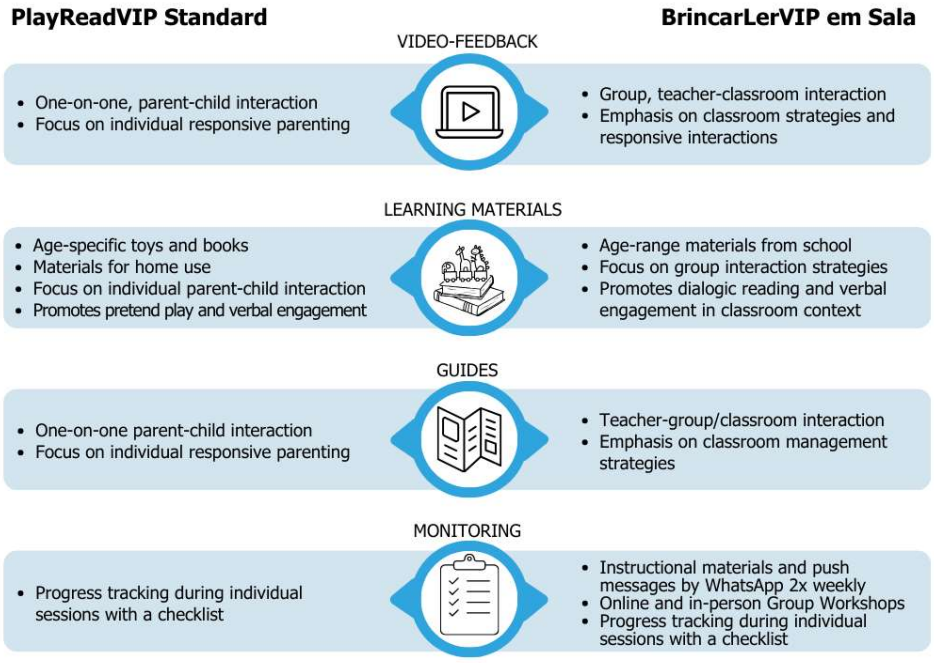
Table 2

Key Adaptations from PlayReadVIP to BrincarLerVIP em Sala

Adaptation	*PlayReadVIP (Original)*	*BrincarLerVIP em Sala*	*Rationale*
1. Interaction Context	*Individualized parent-child interactions*	*Teacher-child interactions in classroom setting*	*Expansion of program reach to benefit multiple children simultaneously and integration into the Brazilian educational context*
2. Developmental Milestones	*Age-specific benchmarks in "What I've noticed" section*	*Adaptation to age ranges in the Teacher Guide*	*Greater flexibility for application in classrooms with children of varying developmental levels and abilities*
3. Pedagogical Guidance	*Focus on tips for individual interaction*	*Focus on classroom management strategies and effective interactions in DR context*	*Adaptation to the specific needs of teachers working with groups of children simultaneously*
4. Support Materials	*Extensive material focusing on specialist-led video review sessions*	*Brief instructional materials (text messages, short videos, pamphlets) delivered as push messages and distributed in workshops*	*Consideration of teachers' time constraints and Brazilian public school resource limitations*
5. Monitoring Structure	*Intensive individual monitoring*	*Combined monitoring system: weekly WhatsApp messages, push messages with tips, workshops, and BrincarLerVIP sessions*	*Adaptation to school realities and creation of a community of practice among teachers*

Figure 2

Core Components Comparison



Expert consultation confirmed the content validity of these adaptations, with particular emphasis on the cultural appropriateness for the Brazilian context. Analysis from Brazilian experienced early child development professionals and teachers indicated that the adapted learning materials, parent guides, checklists and pamphlets were perceived as relevant and accessible.

Analytical Plan

Quantitative Analysis

Before performing statistical analyses, the normality of the raw dataset was assessed using the Shapiro-Wilk test (Shapiro & Wilk, 1965), which indicated that the data did not follow a normal distribution ($p < 0.05$). Consequently, the non-parametric Wilcoxon signed-rank test was used to examine pre-post changes in StimQ$_2$-Teachers scores and ACIRI ratings. Effect sizes were calculated using the rank-biserial correlation (r). For effect size interpretation, values of $r = 0.1$,

0.3, and 0.5 correspond to small, medium, and large effects, respectively (Cohen, 1988). Statistical significance was set at $p < 0.05$. To address multiple comparisons, a false discovery rate of 10% was applied (one in 10 statistically significant tests were considered false positives) (Benjamini & Hochberg, 1995; Storey, 2002). Descriptive statistics (means, standard deviations, frequencies) were computed for Post-test Validity Questionnaire responses. All quantitative analyses were performed using SPSS version 21 software (SPSS Inc., Chicago, IL, USA).

Qualitative Analysis

Responses to open-ended questions were analyzed using thematic analysis (Braun & Clarke, 2006, 2019). This process involved (1) familiarization with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. Keywords were highlighted, data were coded, and major themes and illustrative quotes were identified to complement the quantitative findings. The analytical approach adopted in this study aligns with the systematic steps outlined by Naeem et al. (2023), and is detailed in the Supplementary Material. This methodology allowed us to assess the feasibility and impact of adapting the PlayReadVIP program for classroom use, and the role of teachers in fostering responsive interactions to enhance early childhood development.

Results

Changes in Teacher Practices

StimQ$_2$-Teachers Results. The results demonstrate statistically significant increases (all p values ≤ 0.008) in all subscales of the StimQ$_2$-Teachers assessment. The largest improvement was seen in the StimQ$_2$ Total score, with a dramatic increase from a pre-intervention mean of 86.79 (SD=21.36) to a post-intervention mean of 122.86 (SD=20.19), representing a mean difference of 25.56 points. This change yielded a large effect size (r =1.74). Particularly notable improvements

were observed in the Availability of Learning Materials (ALM) subscale with the largest effect size (r =2.05) and the Reading, Teaching, Verbal Responsivity (READ) subscale which increased by 12 points (from 26.86 to 38.86). The Teacher Involvement in Developmental Advance/ Teaching (TIDA) subscale, while starting from the lowest initial score (4.29), more than doubled after the intervention (11.00). The Teacher Verbal Responsivity (TVR) subscale also showed substantial improvement, increasing from 43.21 to 53.21. These substantial effect sizes across all measures (ranging from r=0.94 to r=2.05) indicate that the intervention had a powerful impact on teachers' practices related to reading and verbal stimulation in the classroom environment.

Table 3

Pre-Post Comparisons of StimQ₂-Teachers Scores

	Mean	*SD*	*Z value*	*r*
READ Pre	26.86	8.619	0.000	8.05
READ Post	38.86	9.020		
TIDA Pre	4.29	2.894	0.001	6.50
TIDA Post	11.00	6.202		
TVR Pre	43.21	11.457	0.008	13.58
TVR Post	53.21	9.839		
ALM Pre	12,43	3.546	0.000	2.87
ALM Post	19.79	3.620		
StimQ₂ Total Pre	86,79	21.358	0.000	1.74
StimQ₂ Total Post	122,86	20.191		

ACIRI Results. Overall, the interactive reading behaviors (ACIRI scores) of teachers demonstrated an increase from the first session (M=18.32, SD=7.35) to the second session (M=21.79, SD=8.62). Of the 14 participants, 9 exhibited improvement compared to the pre-test, 3 recorded lower scores, and 1 teacher maintained her score. Among those who experienced a decline, there were two lead teachers and one assistant teacher lacking a higher education degree.

For the teachers who showed improvement, the average increase was 6.77 points (SD=7.45), with two teachers improving by only 1 point and one teacher achieving a 24 point increase. For those who experienced a decrease, the average score reduction was 5 points. Given the limited sample size (N=14), the data analyzed exhibited considerable heterogeneity and will be presented for each teacher, in which "A" refers to auxiliary teachers, and "F" refers to full teachers. See Table 4.

Table 4

Full and Auxiliary Teacher's ACIRI Scores

Teacher	*1st session*	*2nd session*
*A1**	*8*	*9*
A2	*19*	*19*
*A3**	*8*	*4*
A4	*27*	*32*
A5	*22*	*23*
F1	*31*	*27*
F2	*17*	*22*
F3	*14*	*26*
F4	*23*	*26*
F5	*16*	*20*
F6	*7*	*31*
F7	*25*	*21*
F8	*21*	*12*
F9	*27*	*33*

**These teachers are the only two whose highest level of education is a high school degree.*

The Wilcoxon Signed-Rank Test was conducted to compare the two related conditions. The results indicated that the differences between the paired samples were not statistically significant, Z=1.26, p=.21. The test statistic was 63.50, with a standard error of 14.26. Given that the p-value exceeded the conventional threshold of 0.05, we failed to reject the null hypothesis, suggesting that there was no significant change between the conditions.

Teacher Perceptions of the Program

Quantitative Feedback. Table 5 shows the closed-ended questions answers, categorized into program impact, components, and feasibility, and organized by indicators that synthesize the responses. Teachers evaluated the program's overall effectiveness, specific components, and feasibility utilizing a four-point Likert scale, with values ranging from 1 (strongly disagree) to 4 (strongly agree). The majority of items received mean ratings exceeding 3, signifying strong agreement and positive evaluations. To account for the different weights assigned to each variable, we computed the weighted mean (WAM). The indicator with the highest rating was relevance, with a WAM score of 3.54, suggesting a high level of perceived importance among teachers. Conversely, two indicators received mean ratings below 3: acceptability of activities (WAM=2.89) and barriers (WAM =2.67), indicating that despite recognizing the program's relevance, its implementation encountered challenges. The program component with the highest rating was Online Individual Sessions with a Specialist, with a WAM score of 3.64, followed by Group Teacher Meetings. Although teacher engagement in WhatsApp groups was low, this component still received a WAM rating of 3.0, indicating a high level of satisfaction.

Table 5

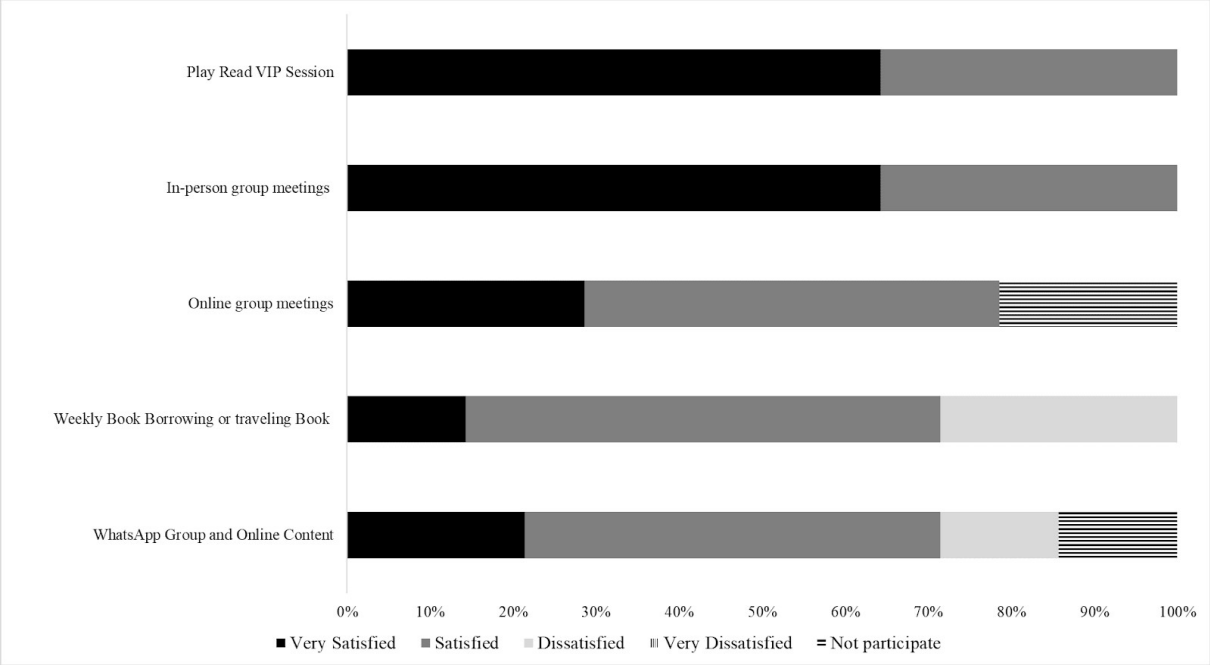
Closed-ended questions answers

Domain/ Indicator	*WAM*	*Range*
Program Impact	3.15	1-4
Learning and Knowledge	3.30	2-4
Acceptability of Activities	2.89	1-4
Improvement in Child Development	3.29	1-4
Program Components	3.29	1-4
Traveling Book	3.09	1-4
Online Individual Sessions with Specialist	3.64	2-4
WhatsApp Group and Online Content	3.00	2-4
Group Teacher Meetings	3.45	2-4
Feasibility	3.18	1-4
Engagement	3.27	2-4
Relevance	3.57	2-4
Format	3.16	1-4
Barriers	2.67	1-4

In assessing the satisfaction levels associated with each component, the majority received positive evaluations, with 84% of respondents indicating either “very satisfied” or “satisfied.” Notably, the components involving group teacher meetings and online individual sessions with specialists garnered the highest ratings, with 100% of responses categorized as either “very satisfied” or “satisfied” (see figure 3).

Figure 3

Component satisfaction



Qualitative Feedback

The thematic analysis process was conducted using an inductive approach, allowing themes to emerge organically from the data rather than imposing preconceived categories (Braun & Clarke, 2006). Initially, the research team engaged in deep immersion with the transcribed conversations, generating preliminary codes based on recurrent patterns and meaningful segments within the data. These codes were subsequently refined through an iterative process of comparison and consolidation. As the analysis progressed, codes were clustered based on conceptual relationships and thematic coherence, resulting in the development of broader themes that encapsulated significant aspects of teachers' experiences. This inductive approach resulted in six themes: (1) Impact on Children's Development; (2) Transformation of Teaching Practices; (3) Appreciation of Teaching Practices and the Emotional Impact of Feedback; (4) Program Evaluation and Perception of the Role of Reading; (5) The Program's Multiplier Effect with

Indirect Impact; (6) Challenges and Suggestions for Future Implementations. Table 6 shows selected quotes extracted from each category.

Table 6

Themes and Selected Quotes

Themes	***Quotes***
Theme 1 Impact on Children's Development Focuses on the program's impact on children, families, and their bond with books.	"When they return with the book, (...) I see the impact when they start telling the story, discussing it, commenting, and talking about the scenes." "Now they are more communicative and engaged. Before, I would start telling the story, and some would walk around, not paying attention. But now, I see them staying in place and really focusing on everything I say." "Learning to dialogue, learning the correct pronunciation of words." "I had many children who were very shy, and I believe these reading and discussion circles made them feel freer to speak." "Their vocabulary, curiosity, and questioning skills have expanded significantly."
Theme 2 Transformation of Teaching Practices Centers on the transformation of teaching practices and instructional strategies, emphasizing self-reflection and technique improvement.	"It sparked a greater interest in storytelling. I used to do it before, but after the program, I became much more engaged." "I used storytelling techniques, but I didn't realize how much impact they actually had." "The feedback we received about our storytelling helped me understand the importance of respecting the children's moment." "I started paying more attention to how I read, how I communicate with the children during storytelling." "Listening to them makes them feel more immersed. 'She is listening to me, she is looking at me.' That was significant for me—I learned to listen."
Theme 3 Valuing Teaching Practices and the Emotional Impact of Feedback Addresses the appreciation of teaching practices and the emotional impact of feedback.	"She has no idea how much of an incentive she gave us, just through her words. The way she acknowledged our work and pointed out things we didn't even notice made me very happy." "Criticizing flaws is easy, but sometimes you don't even try to see the positive aspects. She was able to highlight them, and I thought, 'Now I want to improve.' That was really valuable for me." "She lifted the teachers' spirits—she has no idea! Just by talking about our work, she energized the whole group, and everyone appreciated it." "Every time we had a meeting, she only had positive feedback, and I saw that I could apply everything we discussed in my classroom." "Before, I was more frustrated by not seeing the children participate. Now, I see their participation differently—I don't focus so much on the critical side but rather on the positive aspects."

Theme 4: Program Evaluation and Perception of Reading's Role Covers the program's evaluation and how it influenced the perception of the role of reading.	"We do many things without knowing their meaning, and through the program's feedback, we now understand why we do them." "Telling children about colors, naming objects, counting—before, I only did it when the book required it. Now I see that it's important even when the book doesn't prompt it because children learn through interaction and play." "I think the program teaches a lot about the 'why' behind our actions." "I learned that reading is extremely important. I already knew this, but the program reinforced it even more." "Even though we don't focus on literacy here, the project showed that naming things isn't necessarily about teaching them to read—it's about teaching in a broader sense."
Theme 5 The Program's Ripple Effect and Indirect Impact Highlights the program's multiplier effect, extending its impact beyond direct participants.	"After this project, I noticed that other teachers also started implementing similar activities in their classrooms." "It even encouraged other teachers to bring this practice into their classrooms. We hadn't seen this happen in previous years."
Theme 6 Key Challenges and Suggestions It brings together the challenges and suggestions for improvements for future implementation.	"There was a great lack of interest, despite the meetings, despite their tips, which were very good. I think there was no real partnership." "Regarding the book loan, sometimes I felt that parents were not well informed (...) it seemed like the information was unclear." "Families said they liked the program, but they didn't engage with the traveling book initiative. It was difficult to deliver and get the book back." "Sometimes we get so lost in our routine that we don't pay attention to certain details." "My routine is too busy to dedicate more time to it. That was my failure because I could have made more of an effort, but with everything going on, I let it slip by."

Implementation Fidelity

Analysis of implementation logs indicated that teachers implemented an average of 4.21 reading sessions per week (range:1-5) over the 12-week intervention period. Full fidelity to the program protocol (defined as participating in the two PlayReadVIP sessions) was achieved by 100% of participants. The most consistently implemented components were PlayReadVIP sessions and in-person meetings, while the most frequently omitted were online group meetings and WhatsApp group.

Discussion

This pilot study examined the adaptation, implementation, and preliminary effectiveness of the PlayReadVIP program for use in Brazilian preschool teachers. The findings suggest that the adapted BrincarLerVIP em Sala program is feasible to implement in this context and shows promise for enhancing teacher-child interactions during reading activities. Several key findings warrant further discussion.

Feasibility of Adaptation to the Classroom Context

The systematic adaptation process employed in this study successfully transformed an intervention originally designed for pediatric primary care settings into a classroom-based program while maintaining core principles of DR and responsive interaction. This finding is consistent with previous research suggesting that evidence-based interventions can be effectively adapted across different contexts when adaptations preserve core program components while addressing contextual constraints (Castro et al., 2004; Barrera et al., 2013). Our preliminary assessment of teacher engagement is consistent with findings that video-based training on dialogic reading significantly enhances teachers' implementation of individualized interventions within the DR instructional sequence (Fleury et al., 2024). Post-training, educators showed better implementation of specific DR strategies during shared reading with children.

The modifications required for classroom implementation—particularly the shift from individual parent-child interaction to teacher self-reflection about group interaction strategies—represent a significant departure from the original program design. Despite this, our findings suggest that this adaptation did not compromise effectiveness and may have increased program sustainability by building teacher capacity for ongoing self-assessment. This aligns with growing

evidence supporting the value of video-based reflection for teacher professional development (Fukkink et al., 2011; Hamre et al., 2013; Pianta et al., 2008).

Despite overall feasibility, implementation challenges related to time constraints and classroom management highlight the importance of considering structural factors in early childhood education settings when adapting interventions. As noted by Yoshikawa et al. (2018), structural supports—including appropriate teacher-child ratios and planning time—are critical enablers of process quality improvements. Future iterations of the program might benefit from more explicit attention to these contextual factors, perhaps through additional components addressing classroom organization strategies or streamlined implementation procedures.

Impact on Teacher Practices and Perceptions

The significant improvements observed in StimQ$_2$-Teachers scores suggest that the BrincarLerVIP em Sala program effectively enhanced the quality of cognitive stimulation and teacher-child interactions in participating classrooms. Educators rated the importance and feasibility of DR strategies highly, suggesting positive perceptions of the intervention's social validity. These findings are consistent with other studies demonstrating that targeted professional development can improve educator practices related to language stimulation and dialogic reading (Hamre et al., 2013; Lonigan et al., 2011; Pentimonti et al., 2017; Pianta et al., 2008).

Particularly noteworthy is the improvement in teachers' use of open-ended questions and expansions of children's responses—key elements of dialogic reading associated with language development (Flores et al., 2014; Rogoski et al., 2015; Whitehurst et al., 1988). Teachers' qualitative reports of increased awareness of their interaction patterns suggest that the video self-reflection component may have been especially powerful in promoting these changes, consistent with research on the effectiveness of video feedback in changing adult-child interaction patterns

(Fukkink et al., 2011). The strengthening of children's connection with books emerged as a central result of the program, corroborating research demonstrating the fundamental role of reading in language and communication development (Dowdall et al, 2019; Weisleder et al., 2018). Educators' observations that children became "more communicative and participative" reflect a significant change in classroom dynamics, where interaction and expression of thoughts and feelings became more evident. The observed improvements in classroom practices occurred despite the relatively brief duration of the intervention, suggesting that even short-term professional development can yield meaningful changes when it includes concrete strategies and opportunities for reflection. This impact aligns with findings in parenting outcomes, where a single session is correlated with enhanced responsive parenting behaviors (Piccolo et al., 2023). However, the sustainability of these changes without ongoing support remains an open question that should be addressed in future research through longer-term follow-up.

In the ACIRI results, when examining individual pre- and post-intervention scores, a positive trend was observed in 10 out of 14 teachers, who showed an increase in their scores. One teacher maintained the same score (pre=19, post=19), while three teachers exhibited a decrease. It is important to highlight that the three teachers whose scores decreased were assistants, two of them had high school level of education, and during the validity questionnaire, expressed beliefs and attitudes that may have influenced their engagement with the intervention. Their responses included statements such as "children are too young to read," and "we are overwhelmed with too many tasks," among other comments reflecting a lack of engagement and/or beliefs that may require a longer or more tailored intervention to address their specific needs and backgrounds.

Lastly, particularly noteworthy is the improvement in teachers' use of open-ended questions and expansions of children's responses. The transformation of teaching practice, as

observed in teachers' increased appreciation of storytelling techniques, indicates a process of self-reflection and professional development essential to contemporary education. One teacher's comment about understanding "the why of each thing" highlights the importance of cultivating a more critical and reflective pedagogy.

Potential for Impact on Children and Families

While this study did not directly reflect on child outcomes, the significant improvements in child behaviors, reported in Mazzuchelli et al. (in prep), suggest potential benefits for language and literacy development. Previous research has established strong associations between adult-child interaction quality during reading and developmental outcomes (Howard et al., 2024), providing a theoretical basis for expecting positive effects on children's skills.

The qualitative finding that children began requesting similar interactive reading approaches at home is particularly intriguing, as it suggests potential for the classroom intervention to influence home literacy practices indirectly. This aligns with ecological systems theory (Bronfenbrenner, 1979), which emphasizes the interconnections between microsystems (classroom and home) and the potential for bidirectional influences. Future research should more systematically examine these potential transfer effects, perhaps through direct assessment of home literacy practices before and after classroom implementation.

Teachers' Mental Health and Implementation Quality

Although not a primary focus of the current study, our findings raise important questions about the relationship between teacher well-being and implementation quality. Some qualitative responses (e.g., "There are 25 children, right? (...) They are really active"; "And it ended up making my routine not allow me to dedicate more time"; "sometimes we get so caught up in the routine that we don't pay attention to some details") suggested that teachers experiencing higher levels of

stress found it more challenging to maintain consistent implementation, particularly of components requiring emotional availability and responsiveness. This observation aligns with previous research suggesting that caregivers' psychological resources influence the quality of their interactions with children (Hamre & Pianta, 2004; Jennings & Greenberg, 2009).

As Yoshikawa et al. (2013) have noted, teacher characteristics—including mental health and psychological resources—constitute a critical aspect of structural quality that ultimately influences process quality in early childhood education programs. The study raises important questions about the relationship between teacher well-being and implementation quality. Future adaptations of the BrincarLerVIP em Sala program might benefit from incorporating components specifically designed to support teacher well-being, potentially enhancing both implementation fidelity and effectiveness. This suggestion is consistent with emerging approaches to professional development that address educator mental health alongside pedagogical practices (Jennings et al., 2017).

Limitations and Future Directions

Some limitations of this study should be acknowledged. First, the absence of a control group limits our ability to attribute observed changes specifically to the intervention rather than to other factors such as increased attention to reading practices or seasonal variations in classroom activities. Future research should employ more rigorous experimental or quasi-experimental designs to establish causal effects.

Second, the relatively small sample size and focus on a specific geographic region limit generalizability to the broader Brazilian context. Larger-scale implementation across diverse settings would provide valuable information about the program's effectiveness under varying

conditions. Future research with larger samples and extended intervention periods may provide a more robust evaluation of the intervention's effectiveness.

Third, the reliance on teacher self-report for some measures introduces potential social desirability bias. Future studies should incorporate more extensive observational measures and direct assessments of child outcomes.

Fourth, the short-term nature of this pilot study precludes conclusions about the sustainability of observed changes or long-term impacts on children's development. Longitudinal follow-up would provide critical information about the durability of effects and potential sleeper effects that might emerge over time.

An additional important consideration for future research is the incorporation of psychological and professional well-being measures. We recommend that future studies include comprehensive assessments of teacher self-efficacy, measuring educators' confidence in their ability to implement dialogic reading strategies and manage classroom interactions effectively; depression and mental health indicators, exploring the relationship between teachers' psychological well-being and their capacity to engage in responsive and interactive teaching practices; and stress levels and emotional regulation, investigating how teachers' psychological resources impact the quality of classroom interactions and program implementation. These psychological measures would provide deeper insights into the complex dynamics of educational interventions and teacher performance, potentially offering a more nuanced understanding of the factors that influence program effectiveness (Guo et al, 2010).

Conclusion

This pilot study provides promising evidence of the feasibility and potential effectiveness of adapting the PlayReadVIP program for use in Brazilian preschool classrooms. The

BrincarLerVIP em Sala program successfully maintained the core principles of dialogic reading while addressing the unique challenges of classroom implementation, leading to significant improvements in teacher-child interaction quality. These findings underscore the importance of context-specific adaptations of evidence-based interventions and demonstrate how educational practices can be effectively tailored to meet local needs.

The results highlight the fundamental role of reading in children's formation and emphasize the need for integrated approaches that address both teacher training and family engagement. While video training represents a useful initial step, further support and intensive training are needed for educators to implement dialogic reading with fidelity. The continuity and improvement of initiatives like this are crucial for achieving a more inclusive and meaningful education that values reading as a cornerstone in children's holistic development.

In addition to these initial findings, this study highlights several promising directions for future research. Key priorities include conducting a randomized controlled trial to establish causal effects on teacher practices and child outcomes, examining potential moderators of program effectiveness (e.g., teacher characteristics, classroom structural factors, and child demographics), and investigating whether classroom intervention influences home literacy practices, potentially through a family engagement component. Future research should also more systematically examine potential transfer effects, potentially through direct assessment of home literacy practices and longer-term follow-up studies. Additional areas to explore include the relationship between teacher well-being and implementation quality, assessing the cost-effectiveness of the adapted program relative to other professional development approaches, and identifying strategies for sustainable implementation at scale. The potential impact of such interventions extends beyond

immediate educational outcomes, offering valuable contributions to early childhood development, professional teacher growth, and educational equity in Brazilian preschools.

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Supplementary Material

1. Social Validity Questionnaire Overview

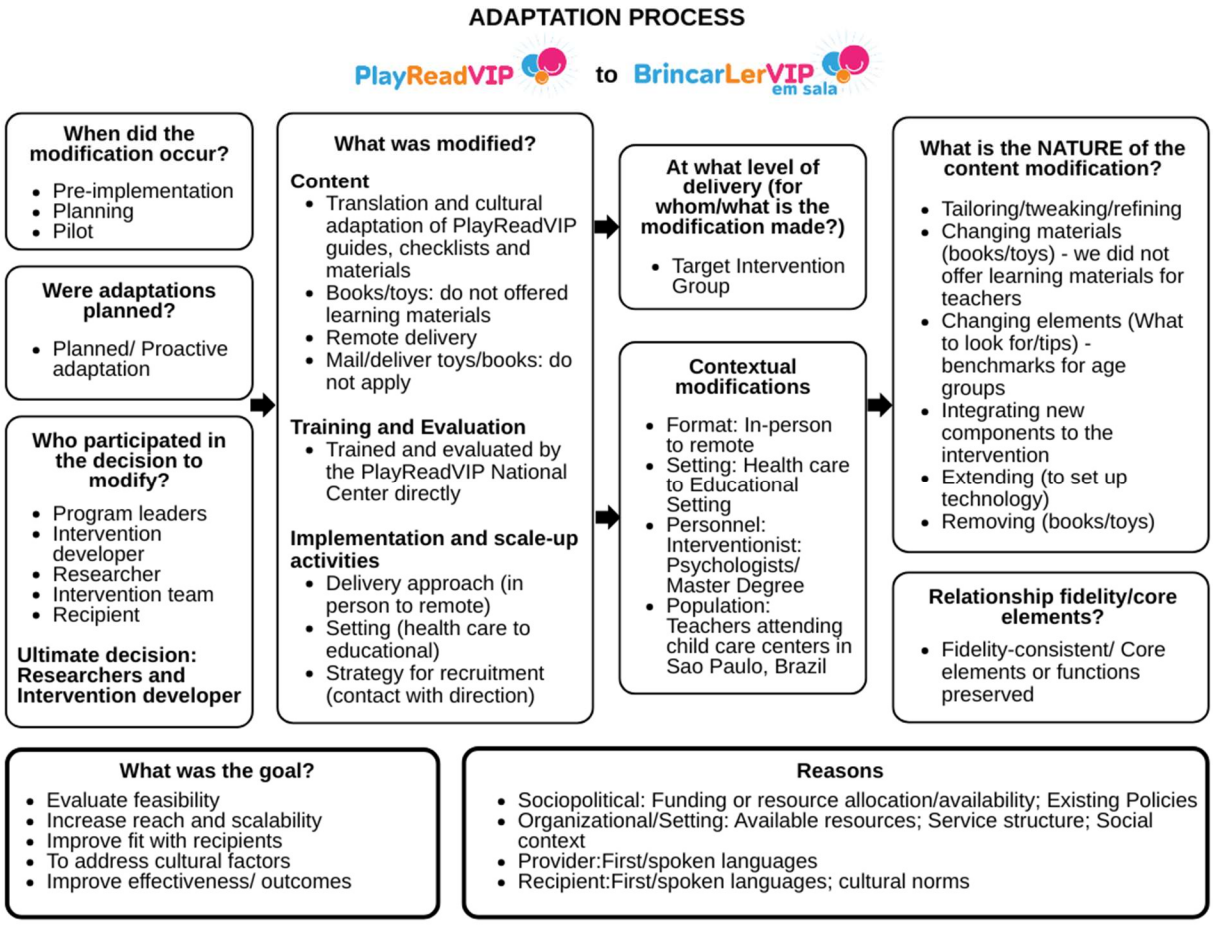
Indicator	*Questions*
Program Impact	
Learning and Knowledge	• *I learned new things about dialogic reading.* • *My knowledge about dialogic reading remained the same.* • *I would be able to talk about dialogic reading with friends.* • *The program left me more confused about dialogic reading.*
Acceptability of Activities	• *The program's activities are easy to do and fit into my routine.* • *I found it tough to use the tips in my daily schedule or didn't have time to do it.* • *Overall, it seems that the families liked the program and participated in the activities.* • *Families did not return the books, or did not want to take them.*
Improvement in Child Development	• *The children seem to enjoy the moments we had during the program..* • *The program has helped my children learn better ways to talk and explore books.* • *I see my children more interested in reading and books since the program started.*
Program Components	
Weekly Book Borrowing or traveling Book	• *Book borrowing allowed my children to read different books at home.* • *It was challenging to send books every week.* • *I found it hard to include the reading routine everyday in my classroom.* • *It was really fun to read in the classroom, and it reinforced a habit in our routine.* • *I did not implement the traveling book or the book borrowing because I didn't have time or didn't understand the proposal.*
Online PlayReadVIPSessions	• *I felt comfortable speaking during the online individual sessions.* • *I felt the individual sessions with a specialist were helpful to me.* • *I felt that the sessions with the program specialist were uninteresting or unhelpful.*
WhatsApp Group/ Online Content	• *The WhatsApp group was an opportunity to share experiences with other teachers.* • *The WhatsApp content didn't add much to what I had already learned before.*
Group Meetings	• *The group meetings were an environment where people could talk and feel heard.* • *It was essential to learn important things about reading in these meetings.* • *The group meetings were not helpful or didn't seem important.*
Satisfaction with each component	• *Indicate how satisfied you were with each component of the intervention, including* • *Weekly book borrowing or Traveling book, Online individual sessions with specialist, WhatsApp group and shared online content, In-person group meetings, Online group meetings.*

Favorites strategies	• *Select two that were your favorites strategies: Weekly book borrowing or Traveling book, Online individual sessions with specialists, WhatsApp group and shared online content, In-person group meetings, Online group meetings.*
Feasibility	
Engagement	• *I felt welcomed in the activities.* • *I would participate in the program again if given the opportunity.* • *I found it hard to engage with the program.*
Relevance	• *I believe that the program is important to the children's development now and in the future.* • *I think that the program respected my values, culture and how we live.* • *The program was of little importance for me.*
Format	• *I wish the program had lasted for more than 12 weeks.* • *I felt the program was too long and tiring.* • *I liked having online components because they helped me participate.* • *I didn't like the online format; I wish everything was in person.*
Barriers	• *There were no barriers or challenges to implementing the program.* • *There were barriers, and the program did not work as it should.* • *There were barriers, but we managed to overcome them, and the program worked.*
Open-ended question	• *How did being a part of BrincarLerVIP em Sala affect how you read with your children?* • *How did being a part of BrincarLerVIP em Sala affect your relationships with your children?* • *How did the program affect the development of participating children?* • *Tell me about anything you learned from BrincarLerVIP that was useful or helpful.* • *Would you like to add anything that we haven't asked you about?*

2. Frame Framework Adaptation

Figure 1

Adaptation and Modifications based on Frame Framework



3. Table Online Content Details

Online Content	*Format*	*Example message*
Card reminding	*JPEG*	*"Fri-yay, it's time to borrow your book at the school library"*
10 ideas for what you can do while reading to your children (Adapted from Mendelsohn et al., 2021)	*PDF*	*"Ask open-ended questions that encourage the children to think and talk more about the story."*
5 Steps for Brain Development (Adapted from Harvard University, Center on the Developing Child, n.d.)	*PDF*	*"Every time you respond to an invitation, give the child a chance to respond. The back-and-forth exchange can be quick (from the child to you and back) or it can last many turns. Waiting is crucial. Children need time to form their responses, especially when they are learning so many things at once. Waiting helps keep the back-and-forth going.*"
Excerpts from statements and key-moments of the training meetings	*Video*	*(...) "Reflecting on this exchange, I was reminded of the analogy with building blocks, where VOCABULARY is compared to blocks, and children are seen as builders who carry and use these blocks to expand their linguistic understanding and expression. I'm going to share a snippet of this analogy here, take a look: (vídeo sharing)"*

General Discussion

This dissertation examined the implementation and effectiveness of remote interventions promoting early relational health through responsive interactions and shared reading practices, with a specific focus on vulnerable populations in Brazil. Through four interconnected manuscripts, this work investigated different dimensions of these interventions, from their theoretical foundation to their adaptation and implementation in Brazilian educational contexts.

Synthesis of Key Findings Across Manuscripts

The systematic review presented in Manuscript 1 revealed that even in remote formats, interventions can produce significant positive effects on parent-child interactions and child development, particularly regarding emergent language skills. Importantly, the analysis identified a notable scarcity of studies conducted in low- and middle-income countries, highlighting the critical contribution of this dissertation in addressing this gap in the literature.

The cultural adaptation process documented in Manuscript 2 demonstrated that the PlayReadVIP model could be successfully adapted to the Brazilian context as BrincarLerVIP em Sala. Feasibility data indicated high levels of acceptability among Brazilian participants, with minor adjustments required during the adaptation process, confirming the cultural relevance. These findings suggest that interventions such as PlayReadVIP, developed in other contexts can be successfully culturally adapted to meet the specific needs of Brazilian families.

Manuscript 3 provided evidence regarding the effectiveness of the adapted program. The results revealed significant improvements in responsive parenting practices and parent-child interactions during shared reading activities, in addition to showing improvements in children's expressive vocabulary. The BrincarLerVIP em Sala intervention demonstrated promising effectiveness across multiple domains, with particularly robust effects on parent-child interaction quality, responsive parenting practices, cognitive stimulation, and children's language.

Manuscript 4 extended the investigation into educational settings, documenting both the adaptation process for teachers and the program's impact on educational practices. The findings suggest that the adapted BrincarLerVIP em Sala program is feasible to implement in classroom contexts and shows promise for enhancing teacher-child interactions during reading activities. Improvements in teacher-child interaction quality indicate that this adaptation represents a potentially valuable approach to enhancing early literacy environments in Brazilian educational centers.

Integration and Dialogue Among Findings

Collectively, these studies reveal how remote interventions focused on responsive parenting and dialogic reading can be structured to address different agents (parents and teachers) and contexts (home and school), creating a more robust support network for child development. The findings converge on a fundamental conclusion: culturally adapted remote interventions can effectively promote responsive interactions and shared reading practices in vulnerable populations, regardless of the implementation context.

The mixed results observed across different outcome domains underscore the complexity of implementing parenting interventions. While significant improvements were noted in parent-child interactions and children's language skills across studies, opportunities exist for enhancing program impact on disciplinary practices and parental mental health outcomes. These varying outcomes across domains demonstrate the need for nuanced program development that accounts for the multifaceted nature of early relational health interventions.

Theoretical and Methodological Contributions to the Field

This dissertation offers significant theoretical and methodological contributions to the field of early interventions. Theoretically, it expands the understanding of how early relational

health principles can be applied in low- and middle-income countries, demonstrating that the concept of responsive interactions and dialogic reading transcends cultural boundaries when appropriately adapted.

Methodologically, the dissertation innovates by presenting a systematic cultural adaptation process that maintains fidelity to the core components of the original intervention while incorporating culturally relevant elements. This adaptation model can serve as a reference for future efforts to transfer interventions between distinct cultural contexts. The successful adaptation and implementation for remote delivery highlight the potential for broader application in similar contexts.

Additionally, this work contributes to the development of methods for evaluating remote interventions, proposing viable approaches for measuring changes in parent-child and teacher-student interactions in non-face-to-face formats, a particularly relevant challenge in the current context of expanding digital technologies in education.

Implementation Science Approaches

The Brazilian adaptation has brought forth both the challenges and potential rewards of cross-cultural implementation science approaches. Successful adaptations, as demonstrated in Parra-Cardona et al. (2017), require engagement with cultural values, contextual challenges, and unique experiences of target populations. This adaptation process illuminated the importance of distinguishing between the core components essential for promoting caregiver-child relationships and the adaptable elements that could be modified to better align with Brazilian family dynamics and educational structures, ultimately enhancing the intervention's relevance and effectiveness in addressing early childhood disparities in this new context.

The adaptation of evidence-based interventions across populations presents multifaceted challenges that extend beyond simple translation processes. As Chambers (2023) highlights, variability constitutes a significant obstacle, with countless permutations of interventions requiring adaptation based on demographic and contextual variables. This complexity is compounded by the potential rigidity of adapted interventions, which may become as inflexible as their original versions if not properly designed. Cultural adaptation further demands maintaining conceptual equivalence, where original meanings must resonate within the target culture despite differences in language nuances and cultural perspectives on health (Wild et al., 2005). In the context of adapting video-feedback strategies for promoting early relational health in Brazil, these challenges are particularly salient given the structural differences in early childhood education and health systems between the United States and Brazil.

Implementation science has evolved to address these challenges through several significant advancements. Conceptual frameworks like the Framework for Reporting Adaptations and Modifications to Evidence-based Interventions (FRAME) were used to provide a structured approach for operationalizing the adaptation (Stirman et al., 2019). Systematic adaptation processes have emerged, with Escoffery et al. (2018) identifying common steps including community assessment (reported in 88.1% of studies), preparation of new materials (88.1%), implementation (83.3%), and evaluation (76.2%). Our research deliberately incorporated these systematic steps, with particular attention to community assessment that identified the unique needs of vulnerable Brazilian families and educational settings. Additionally, the remote delivery component of our intervention required developing culturally appropriate digital materials that resonated with Brazilian caregivers while maintaining the core mechanisms of change established in the original interventions.

Gender Dynamics in Parental Intervention: The Maternal Care Burden

As our research developed, it was impossible to ignore the gendered nature of parental involvement in the intervention, with mothers constituting the overwhelming majority of participants with only one father independently completing the post-test. This pattern reflects the persistent feminization of care work globally, where childcare responsibilities continue to fall disproportionately on women despite increasing female participation in formal labor markets (Sorj, 2014; Biroli, 2018). In Brazil specifically, women spend on average 21.4 hours weekly on household tasks compared to 11.1 hours for men, with this disparity intensifying when children are present (Instituto Brasileiro de Geografia e Estatística [IBGE], 2020).

This maternal burden presents a significant hidden dimension of educational interventions that must be acknowledged: when we design and implement parental programs, we might be primarily creating additional responsibilities for already overburdened mothers. As Hirata and Kergoat (2007) note, the "conciliation" between professional and family responsibilities often represents not a balanced sharing of tasks but rather an intensification of women's work across multiple domains. This dissertation's findings must therefore be contextualized within broader patterns of gender inequality, where even well-intentioned educational initiatives may inadvertently reinforce the unequal distribution of care labor.

The presence of only 2 fathers participating alongside their wives during the sessions, while representing a positive exception, underscores the substantial gender gap in educational engagement. This reflects broader societal patterns where maternal involvement in children's education is normalized while paternal involvement remains optional or supplementary (Carvalho, 2004; Marcondes, 2013). Any meaningful advancement in parental interventions must therefore incorporate strategies to engage fathers more effectively while simultaneously recognizing and

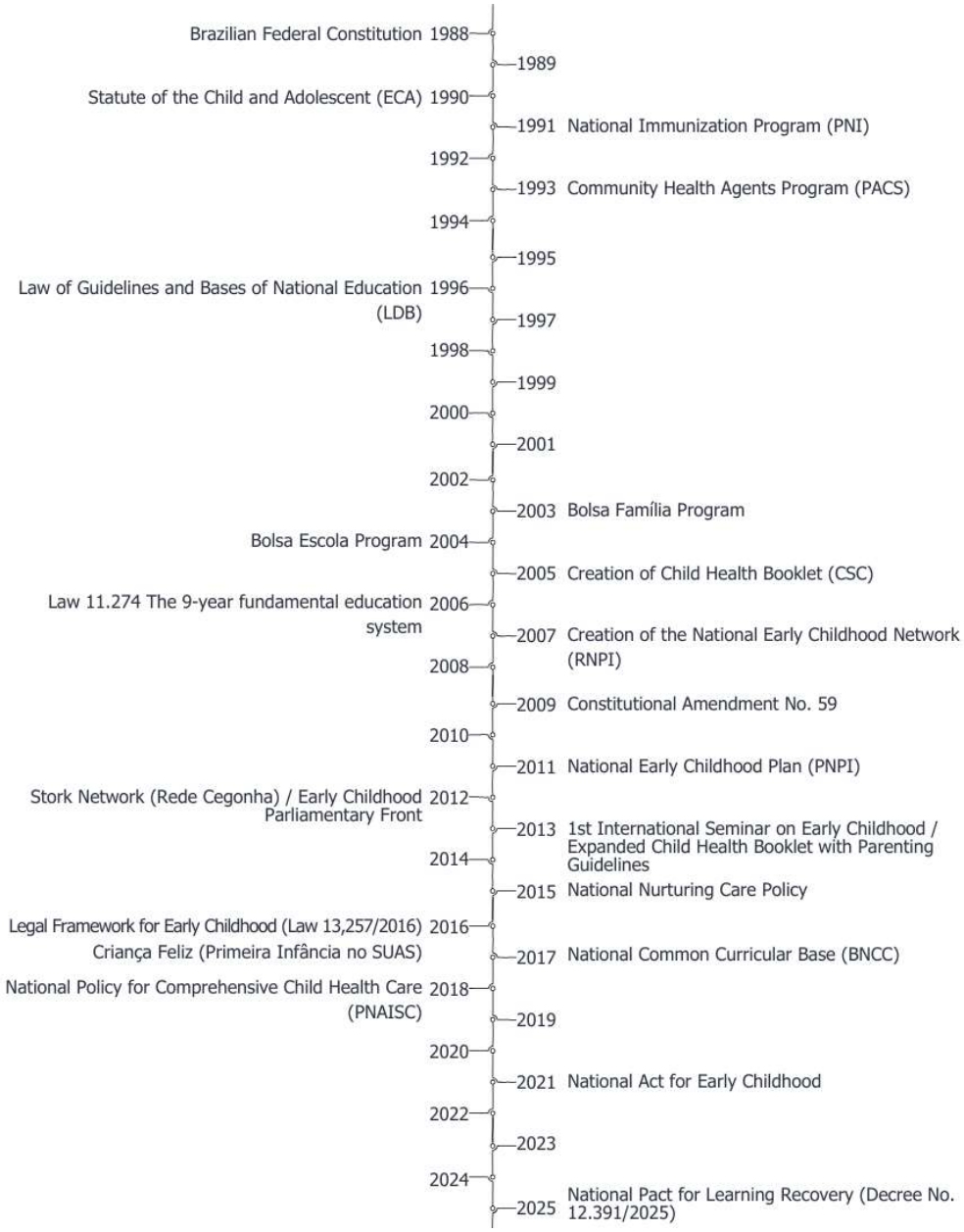
valuing the intensive care work performed by mothers. Educational policies must move beyond gender-neutral language that obscures these realities and directly address how care responsibilities are distributed within families.

Practical Implications for Educational Policy in Brazil

This research offers some contributions to Brazil's evolving early childhood policy landscape. To make this clearer, we have prepared a timeline of early childhood policies in Brazil (See Figure 1), which helps to visualize how interventions such as PlayReadVip em Sala integrate into the historical landscape As illustrated by our timeline of Brazil's legal frameworks and educational policies (1988-2025), the country has progressively developed approaches to early childhood development. The current intervention study aligns strategically with this policy evolution and can enhance its implementation in several ways.

Figure 1

Timeline of Early Childhood Policies in Brazil (1988-2025)



The 1988 Federal Constitution established education as a fundamental right and duty of the state, creating the legal foundation for early childhood education policies. Building on this, the 1990 Statute of the Child and Adolescent (ECA) revolutionized the legal approach to childhood in

Brazil by recognizing children as rights-bearing subjects rather than objects of intervention, establishing a protection system.

The 1996 Law of Guidelines and Bases of National Education (LDB) further solidified early childhood education as an official stage of basic education, integrating early care into the educational system. These foundational frameworks were complemented by social welfare initiatives such as the 2003 Bolsa Família Program, which addressed poverty's impact on child development through conditional cash transfers that required school attendance and health check-ups.

Health sector integration advanced with the 2006 Family Health Program (Programa Saúde da Família) Expansion, which increased access to preventive healthcare for families with young children. That same year, the implementation of Law 11.274 established the nine-year fundamental education system ("Ensino Fundamental de 9 anos"), guaranteeing children access to basic education starting at age 6. The 2007 Creation of the National Early Childhood Network (Rede Nacional Primeira Infância) marked a significant step in policy coordination by bringing together over 200 organizations to advocate for integrated early childhood approaches.

The 2009 Constitutional Amendment No. 59 extended compulsory education to ages 4-17, demonstrating increased recognition of early education's importance. The 2011 National Plan for Early Childhood (Plano Nacional Para Primeira Infância) established 12-year goals for early childhood development across sectors. Legislative momentum continued with the 2012-2013 Parliamentary Front for Early Childhood and 1st International Seminar for Early Childhood, which strengthened political will for early childhood policies. The 2013 Enhanced Child Health Booklet with Parenting Guidance expanded traditional health monitoring to include parenting support information, directly aligning with our intervention's focus.

The 2013 Legal Framework for Early Childhood Bill initiated the groundwork for what would become the most comprehensive early childhood legislation in Brazil. This culminated in the 2016 Legal Framework for Early Childhood (Law 13.257/2016), which consolidated a rights-based, science-informed approach to early childhood policy and explicitly recognized the importance of parent-child relationships. This was especially important in the context of this research, as it opened the way for more widespread acceptance, in educational settings, of evidence-based approaches, as well as officially recognizing the importance of Early Relational Health, even if not under that exact denomination.

The 2016 Happy Child Program (Programa Criança Feliz) implemented home visiting to support vulnerable families with young children, while the 2017 National Common Curricular Base (Base Nacional Comum Curricular) established learning standards for early childhood education that recognized the essential role of relationships and play. It was Brazil's first standardized national curriculum and created educational consistency across the country (Campos, 2018). This policy significantly impacted early childhood education by recognizing the developmental uniqueness of ages 0-5 and instituting six core "rights of learning" focused on play, participation, exploration, expression, self-knowledge, and social connection, representing a major shift toward recognizing early childhood as a distinct educational phase requiring specialized approaches.

In 2018, the National Policy for Comprehensive Child Health Care (Política Nacional de Atenção Integral à Saúde da Criança) integrated healthcare services for children from birth to nine years, emphasizing preventive care and developmental screening (Ministério da Saúde, 2018). The policy created healthcare pathways specifically designed for children, strengthening the connection between health and educational outcomes. By coordinating previously fragmented

services, PNAISC improved access to health services, particularly benefiting vulnerable populations.

The 2021 National Act for Early Childhood codified early childhood (0-6 years) as a national priority, requiring inter-ministerial coordination and dedicated funding streams (Presidência da República, 2021). The Act further emphasized evidence-based interventions and, importantly, established mechanisms for monitoring developmental outcomes, representing Brazil's most comprehensive legal framework for early childhood development to date.

The COVID-19 pandemic (2020-2023) devastated Brazilian education (Soares et al. 2022), with schools closing for longer periods than most countries (UNESCO, 2022). The lack of basic protocols for confronting the pandemic, delays in seeking collective solutions, and the absence of initiatives aligned with scientific evidence intensified problems for the most vulnerable populations (Barcellos et al., 2021). While civil society mobilized numerous isolated initiatives, the fragmented governmental response exacerbated existing inequalities (Abrucio et al., 2022). Children from low-income families suffered disproportionately from limited access to remote learning technologies (IBGE, 2021). The health crisis simultaneously overwhelmed pediatric services, reducing access to routine developmental screenings and vaccinations (SBP, 2021). Family economic instability further compounded these challenges, creating multiple risk factors for early childhood development (Barcellos et al., 2021).

The 2025 National Pact for Learning Recovery directly addresses pandemic learning losses through targeted interventions, dedicated funding, and intergovernmental coordination. The Pact acknowledges the developmental backsliding caused by the pandemic and prioritizes remediation, particularly for early literacy and numeracy skills. Early evaluations suggest

promising improvements in reading proficiency for primary students, though significant challenges remain (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2023).

Despite clear advances over the years, this timeline analysis highlights persistent challenges and prompts critical reflection. The COVID-19 pandemic exacerbated existing weaknesses in Brazil's policy environment, exposing deep-rooted structural issues such as the lack of coordinated responses and misalignment with scientific evidence in education and early childhood development policies. Two major challenges stand out: (1) policy discontinuity during governmental transitions, where initiatives are frequently interrupted before full implementation and evaluation, and (2) in spite of unequivocal legal and policy frameworks in favour of evidence-based educational practices, there is continued resistance to integrating scientific evidence into educational practices and decision-making, often resulting in outdated or ineffective policies (Mazzuchelli & Sargiani, 2024).

While Brazil's policy landscape has evolved, particularly with a notable expansion of initiatives focused on parental care and early education between 2007 and 2017, achieving meaningful progress requires addressing these systemic weaknesses. Ensuring policy continuity and strengthening evidence-based decision-making are critical steps toward improving long-term outcomes for children and families.

The present study emerges from this evolving understanding that early relational health—specifically responsive interactions between caregivers and children—is foundational to child development and serves as a protective factor against poverty. Our research builds upon existing initiatives by providing evidence-based strategies that enhance parental engagement and educational practices, reinforcing the growing recognition in Brazilian policy that investments in caregiver capabilities yield significant developmental benefits.

By demonstrating effective methods for strengthening parental competencies and supporting child development, this study contributes to bridging the gap between policy aspirations and practical implementation. The intervention model adapted and tested could inform professional development programs for early childhood educators and health professionals, equipping them with the skills necessary to engage and support families. As Brazil advances toward cross-sector collaboration in early childhood development, integrating these approaches into training curricula could strengthen workforce capacity for family-centered practices.

Furthermore, the outcome measures and evaluation methodologies employed in this study offer concrete metrics for assessing the impact of parent-focused policy initiatives. These evidence-based indicators can support policymakers in monitoring the implementation and effectiveness of programs aligned with the National Common Curricular Base (BNCC) and other key policy frameworks.

Additionally, the cost-effectiveness analysis presented in this research provides valuable insights for resource allocation. By quantifying the benefits of parent-focused interventions relative to their costs, this study offers empirical justification for sustained investments in preventive family support programs—an essential consideration in a policy environment where funding limitations often dictate program sustainability.

Finally, the intervention's integrated approach—combining educational, relational, and developmental components—illustrates how Brazil's education sector can collaborate more effectively with health and social welfare systems. This aligns with the country's recent policy efforts to promote intersectoral approaches to early childhood development, reinforcing the need for holistic, well-coordinated strategies.

While Brazil has developed a robust policy framework for early childhood development over the past three decades, sustained implementation remains a key challenge. Without mechanisms to ensure policy continuity, integrate scientific evidence into decision-making, and align initiatives across sectors, even the most well-intentioned policies may fail to generate meaningful impact. This research provides a timely contribution by offering validated approaches that can help translate Brazil's policy framework into tangible improvements in child and family well-being across the country.

Limitations and Suggestions for Future Research

Despite promising results, this work presents limitations that warrant consideration. First, the relatively short follow-up period limits our understanding of the sustainability of the observed changes over time. Future studies would benefit from more extensive longitudinal designs to assess the persistence of intervention effects.

Second, although cultural adaptation was a central component of this research, Brazil's regional diversity suggests that additional adaptations may be necessary for different regions of the country. Future research could explore how to adjust the program for different regional contexts within Brazil.

Third, the studies primarily focused on early relational health and child language outcomes, with less emphasis on other domains of child development. Future investigations could expand the assessment to include more comprehensive cognitive and emotional regulation outcomes.

The implementation faced external challenges, notably including a dengue epidemic, which affected participation rates and caused delays in intervention sessions. Additionally, reliance on self-reported data may introduce bias as participants may provide socially desirable responses.

Finally, this study's focus on a specific cultural context may limit the generalizability of the findings to other settings.

To advance this field of research, the following directions are suggested: investigate the underlying mechanisms of intervention effectiveness, identifying the specific components that most contribute to positive outcomes; develop and test large-scale implementation models that can be incorporated into existing educational systems; examine how contextual factors, such as internet access and digital literacy, moderate the effectiveness of remote interventions in vulnerable populations; future research employing controlled designs with larger samples will be essential for establishing causal effects and distinguishing between direct developmental impacts and changes in parental perception and engagement.

Future Perspectives for the Field Based on Dissertation Findings

The results of this dissertation point to a promising future in the field of early childhood development interventions in low- and middle-income countries. Remote approaches to parental support and educator training demonstrate potential to democratize access to evidence-based practices, particularly for historically marginalized populations.

The convergence between technological advances and increased awareness about the importance of the early years creates an opportune moment for the expansion of programs like BrincarLerVIP em Sala. The intervention model tested in this dissertation could be adapted for other Latin American countries and other regions facing similar challenges, contributing to global efforts to reduce disparities in child development.

The growing evidence on the effectiveness of remote interventions may also catalyze changes in child development policies, promoting more hybrid approaches that combine in-person

and remote components to maximize reach and impact. This flexibility will be particularly valuable in contexts with limited resources or geographical dispersion.

Finally, the field appears to be moving toward a more ecological and integrated approach that recognizes the importance of involving multiple agents (parents, teachers, caregivers) and environments (home, school, community) in early childhood development interventions. The findings of this dissertation reinforce the feasibility and value of this integrated approach, even when mediated by remote technologies.

Personal Reflections on the Research Development Process

My decision to pursue a doctoral degree at University of Brasília coincided precisely with the World Health Organization's declaration of the COVID-19 pandemic in March 2020. At that moment, I experienced the same existential dread that permeated global consciousness—"the world might be ending"—and, immersed in this catastrophic thinking, I determined that I would not want to face such an end without having completed my doctorate. In retrospect, this reasoning may not appear entirely rational; however, considering I was isolated with three children aged 13, 6, and 3, I can now understand why rational thought felt somewhat beyond my reach. Nevertheless, I submitted my application in late 2020 and began coursework in 2021. All the courses I took and taught were conducted remotely, and until 2023, I worked extensively as a consultant with parental programs and initiatives for public school educators during the pandemic. The interventions we implemented during this period were emergency responses to the unprecedented circumstances we faced. Being positioned within academia, I recognized the value in investigating how interventions known to be effective in person might translate and impact participants in remote contexts.

The remote delivery format was a proactive adaptation (Stirman et al., 2019) decided upon before implementation, deliberately chosen to enable scalability and to measure the reach

and adaptability of an evidence-based parental intervention previously validated in in-person settings. However, the challenges faced during this remote implementation amid the dengue epidemic provided valuable lessons about resilience and adaptability in educational research, absolutely connected with the challenges the whole world faced in recent years during the COVID-19 pandemic. The need to constantly adjust the program to participants' technological and social realities illustrated that truly effective interventions must be flexible and responsive to context while simultaneously maintaining fidelity to their fundamental principles.

The development of this research represented a transformative journey in my academic and professional trajectory. The process of adapting and implementing the BrincarLerVIP em Sala program allowed me to witness firsthand the potential of culturally adapted interventions to transcend socioeconomic and geographical barriers. Having the opportunity to work alongside the PlayReadVIP National Center team and adapt the programmatic aspects according to protocols was a true privilege that brought me significant learning experiences. The freedom to incorporate new components and utilize remote delivery methods was especially valuable.

Another tremendous opportunity was serving as one of the coaches conducting sessions with families and teachers myself. This meant an enormous number of working hours, and given the 12-week intensive intervention, there were days when I conducted 8 or 9 PlayReadVIP sessions, after studying 8 hours at NYU, despite the time zone differences between countries. This was an honor, because technology allowed me to connect with families I would never otherwise have met. I was welcomed into the homes of highly vulnerable families and witnessed them interacting responsively with their children, seeing their children and their development in new ways, and feeling valued for it. I also had the privilege of conversing for hours in Portuguese (a privilege for someone living away from their homeland) and talking with children who, at this

developmental stage, are particularly irresistible and were so happy to receive attention from their parents.

Particularly impactful was observing how families and educators in vulnerable contexts, often neglected by public policies, demonstrated tremendous capacity to incorporate evidence-based practices when presented in an accessible and culturally relevant manner. This experience strengthened my conviction about the importance of building bridges between academic research and educational practice, especially in contexts of inequality.

Final Considerations

This work contributes to the growing body of research on remote interventions in early childhood development, specifically addressing the unique challenges and opportunities in resource-limited settings. Through systematic investigation and rigorous evaluation, this dissertation advances our understanding of how to effectively implement and scale early relational health interventions where they are most needed. By culturally adapting an evidence-based parenting program with a 25-year track record of consistent results in the United States to the Brazilian context, the research highlights an innovative approach that maintains the program's core principles.

A particularly significant contribution is the adaptation of the program for educational settings, creating a pathway for unprecedented scalability and reach—a critical consideration for countries like Brazil, where resources are scarce and demand is high. This adaptation demonstrates how evidence-based programs can be integrated into existing systems to maximize impact. The research journey documented in these four manuscripts reinforces the conviction that culturally sensitive approaches can create opportunities for all children, regardless of socioeconomic

background, to benefit from responsive interactions, pretend play, and shared reading practices that lay the foundation for lifelong development.

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Appendices

Appendix A - Substantiated opinion of the Research Ethics Committee in Human and Social Sciences of the University of Brasília (CEP/CHS/UnB)

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PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Leitura dialógica em família: ensaio clínico randomizado dos efeitos de um treinamento parental online

Pesquisador: Denise Silva Rocha Mazzuchelli

Área Temática:

Versão: 1

CAAE: 74426223.8.0000.5540

Instituição Proponente: Instituto de Psicologia - UNB

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 6.503.869

Apresentação do Projeto:

Trata-se do projeto de pesquisa intitulado "Leitura dialógica em família: ensaio clínico randomizado dos efeitos de um treinamento parental online", como parte do doutorada da pesquisadora principal Denise Silva Rocha Mazzuchelli, sob orientação da profa Eileen P. Flores, junto ao Instituto de Psicologia da Universidade de Brasília.

Em síntese o projeto é descrito nos termos a seguir reproduzidos:

"Ainda não sabemos se a inclusão de um programa de leitura dialógica realizado de forma online traria benefícios e melhor desenvolvimento para crianças provindas de lares de baixa renda. O projeto de pesquisa se propõe a desenvolver, implementar e avaliar um programa (intervenção) de parentalidade positiva voltado para crianças entre 24 a 47 meses de idade. O programa está ancorado em dois grandes referenciais teórico-empíricos. Por um lado, na experiência dos pesquisadores do grupo de pesquisa Livros Abertos liderado pela professora Eileen Flores do Instituto de Psicologia da Universidade de Brasília em desenvolver uma estratégia eficaz de promoção de leitura dialógica e compreensão textual intitulada LuDiCa (Flores, Pires e Souza, 2014; Moraes, Caldas e Flores, 2020; Rogoski, Nolasco e Flores, 2020). Por outro lado, aliado ao trabalho realizado pelos pesquisadores da Escola de Medicina da Universidade de Nova York (Mendelsohn et. al, 2011; Mendelsohn, Valdez, Flynn, et al., 2007; Mendelsohn, Dreyer, Flynn, et al., 2005) em implementar o projeto intitulado BELLE - The Bellevue Project for Early Language,

Literacy, and Education Success. Dentre as ações realizadas no BELLE, destaca-se o VIP – Video Interaction Project, um programa parental baseado em evidências que usa livros, vídeos e brinquedos para apoiar os pais no desenvolvimento e aprendizagem de seus filhos. O BELLE possui um laboratório de pesquisa comportamental multidisciplinar, sob a liderança de Alan Mendelsohn, cujo objetivo principal é adaptar, desenvolver e avaliar estratégias de cuidados pediátricos primários para trabalhar com famílias de baixa renda de crianças pequenas. No que tange ao formato em que a intervenção deste estudo será realizada, vale ressaltar as evidências recentes sobre a eficácia de treinamentos parentais realizados de forma online (Sanni, 2022; Wood et. al, 2020; Meadan et. al, 2019). Sanni (2022) mencionou a natureza onipresente da internet na vida das pessoas atualmente como um fator a ser incorporado nas intervenções e demonstrou que no referido estudo os pais aderiram ao módulo de vídeo online de leitura compartilhada valorizando essa estratégia como uma fonte instrutiva e útil de informação.Estudos revisados sistematicamente por Araújo, Veloso e Souza et.al. (2020) mostraram que epidemias, tais como COVID-19, H1N1, AIDS e Ebola, elevam o nível de estresse entre pais e filhos e podem trazer diversas consequências psicológicas e emocionais para a família como um todo. Os revisores descreveram que essas experiências adversas podem estar relacionadas à exposição ao estresse tóxico e levam a maiores riscos de atrasos no desenvolvimento e problemas de saúde na vida adulta. Os autores destacaram que a pandemia de COVID-19 tem impactado a saúde da população não somente pelos riscos de exposição ao vírus, e consequente infecção, mas também pelas restrições sociais recomendadas ou obrigatórias que foram e estão sendo impostas. Dentre as discussões apresentadas por Araújo et.al. (2020) há que se atentar a duas conclusões importantes: a primeira é que neste contexto de pandemia pais e cuidadores são impelidos a demonstrarem uma alta capacidade de resiliência para garantir medidas de proteção à saúde das crianças sob seus cuidados; a segunda é que a interação entre as pessoas é um dos pilares para a superação das adversidades. Destarte, a pandemia evidenciou a premência da sistemas de educação resilientes e eficazes, o que significa criar atividades para promover a saúde e o desenvolvimento, por meio de canais diversos de entrega para melhorar a inclusão, prevenindo o estresse tóxico e melhorando a saúde individual de crianças, adolescentes, famílias e de comunidades, como um todo (Conto, Akseer e Dreesen, 2020)."

Objetivo da Pesquisa:

O objetivo Primário do estudo é desenvolver e avaliar o impacto de um programa online de apoio à

parentalidade responsiva durante a leitura compartilhada nos ganhos em habilidades linguísticas, cognitivas e no controle executivo das crianças, e na qualidade das interações entre pais e filhos.
O objetivo Secundário é, através do programa de intervenção, buscar oferecer orientações online para mães e pais e oportunidades práticas para interações sensíveis e responsivas com seus filhos, por meio de momentos de leitura dialógica em família.

Avaliação dos Riscos e Benefícios:

A pesquisadora declara como riscos que "Não há riscos físicos conhecidos envolvidos neste projeto. No entanto, um risco em todos os estudos é em relação à confidencialidade de seus participantes. É possível que alguém obtenha informações sobre os participantes, porém a identidade de todos será preservada. Outro possível desconforto está relacionado ao tempo e ao suposto cansaço no processo de avaliação. Em caso de observação de sinais de cansaço, tanto a avaliação quanto as atividades de estimulação serão interrompidas."
Como benefícios, a pesquisadora afirma que a participação de todos é voluntária, isto é, não há pagamento por ela. Porém, ao participar as mães, pais e cuidadores poderão desenvolver habilidades para cuidar ainda melhor do seu filho; enquanto os educadores podem vir a se desenvolver profissionalmente. Ademais, os participantes contribuirão para uma aproximação de intervenções de Psicologia, Pediatria e Educação, gerando estratégias que possam apoiar crianças em seu desenvolvimento. Espera-se que o conhecimento adquirido seja usado em benefício de outras famílias e crianças no futuro."
Riscos e benefícios estão adequadamente descritos e são eticamente adequados.

Comentários e Considerações sobre a Pesquisa:

Participantes: Está previsto um tamanho de amostra de 90 mães/pais e 90 crianças de dois anos a três anos e 11 meses no total, sendo 45 díades em cada grupo (GE e GC), de ambos os sexos. O tamanho da amostra poderá ser revisto em função de cálculos de estimativa do tamanho da amostra de acordo com o poder estatístico alvo. Os pais das crianças que aceitarem que seus filhos participem do estudo assinarão um Termo de Consentimento Livre e Esclarecido (Kazdin, 2016).
Ambiente e equipamentos: A pesquisa será realizada em creches de ensino regular público da zona leste de São Paulo, São Paulo. Tanto as testagens pré-teste e pós-teste quanto eventuais reuniões com educadores serão realizadas em salas de apoio ou reunião das creches, que possuem ventiladores, iluminação artificial e são espaços silenciosos e reservados. Vídeos-exemplos de LD. Os vídeos serão utilizados ao longo das semanas de intervenção (GE). Eles serão

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filmados preferencialmente com famílias participantes que se voluntariarem para esta finalidade. Materiais impressos, fichas e questionários. Questionários pré e pós-teste; fichas instrucionais e cartazes serão oferecidos aos participantes do GE. Obras infantis. Serão utilizadas obras infantis ilustradas adequadas à faixa etária dos participantes, disponibilizados nas bibliotecas das creches e providas pela equipe de pesquisa.

Observe-se que o grupo controle, encerrado o estudo propriamente dito, receberá o mesmo treinamento oferecido ao grupo experimental, assegurando oportunidade de benefício equivalente ao grupo experimental, um cuidado ético importante.

Considerações sobre os Termos de apresentação obrigatória:

Foram apresentados os seguintes documentos: Cronograma; Carta de encaminhamento; Folha de rosto assinada pela pesquisadora principal e pela Diretora em exercício do Instituto de Psicologia da UnB; Projeto básico; Orçamento; Termo de assentimento (crianças); Termo de consentimento livre e esclarecido (responsáveis); Autorização institucional para sala em que as atividades com as crianças serão realizadas; Termo de autorização de uso de som e imagem (Responsáveis); Currículo Lattes da pesquisadora principal e da profa. orientadora; Aceite Institucional da Diretoria Regional de Educação São Miguel e dos dois Centros de Educação Infantil de São Paulo que as crianças participantes frequentam; Carta de revisão ética; Instrumento de coleta de dados (junto ao responsável); Projeto de doutorado.

Os termos de apresentação estão todos presentes e adequados.

Recomendações:

O projeto pode ser aprovado.

Conclusões ou Pendências e Lista de Inadequações:

Sem pendências. O projeto pode ser aprovado.

Considerações Finais a critério do CEP:

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_2207131.pdf	22/09/2023 11:35:37		Aceito
TCLE / Termos de Assentimento /	CEP_Denise_6_Assentimento_ModeloCEP.docx	22/09/2023 11:33:26	Denise Silva Rocha Mazzuchelli	Aceito

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Continuação do Parecer: 6.503.869

Justificativa de Ausência	CEP_Denise_6_Assentimento_ModeloCEP.docx	22/09/2023 11:33:26	Denise Silva Rocha Mazzuchelli	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE_modeloCEP_Denise.pdf	22/09/2023 11:33:16	Denise Silva Rocha Mazzuchelli	Aceito
Outros	autorizacao_institucional_uso_sala.pdf	20/09/2023 15:47:31	Denise Silva Rocha Mazzuchelli	Aceito
Outros	CEP_Denise_2_Carta_de_Revisao_Etica.pdf	20/09/2023 14:52:01	Denise Silva Rocha Mazzuchelli	Aceito
Outros	Curriculo_Lattes_Eileen.pdf	20/09/2023 14:51:09	Denise Silva Rocha Mazzuchelli	Aceito
Outros	Curriculo_Lattes_Denise.pdf	20/09/2023 14:50:54	Denise Silva Rocha Mazzuchelli	Aceito
Outros	Instrumento_Coleta_Dados.pdf	20/09/2023 14:46:12	Denise Silva Rocha Mazzuchelli	Aceito
Declaração de Pesquisadores	CEP_Denise_1_Carta_de_Encaminhamento.pdf	20/09/2023 14:41:01	Denise Silva Rocha Mazzuchelli	Aceito
Outros	aceite_institucional_DeniseMazzuchelli_assinado.pdf	15/09/2023 16:02:59	Denise Silva Rocha Mazzuchelli	Aceito
Folha de Rosto	folhaDeRosto_DeniseMazzuchelli_DraFabricia_assinado.pdf	11/09/2023 14:30:52	Denise Silva Rocha Mazzuchelli	Aceito
Projeto Detalhado / Brochura Investigador	Projeto_Doutorado_CEP_DeniseMazzuchelli_Ago23.pdf	02/09/2023 12:38:56	Denise Silva Rocha Mazzuchelli	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	CEP_Denise_8_Autorizacao_som_imagem.docx	01/09/2023 16:35:33	Denise Silva Rocha Mazzuchelli	Aceito
Orçamento	CEP_Denise_10_Orcamento.docx	01/09/2023 16:30:30	Denise Silva Rocha Mazzuchelli	Aceito
Cronograma	CEP_Denise_Cronograma.docx	01/09/2023 16:26:25	Denise Silva Rocha Mazzuchelli	Aceito

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

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Continuação do Parecer: 6.503.869

BRASILIA, 13 de Novembro de 2023

Assinado por:
ANDRE VON BORRIES LOPES
(Coordenador(a))

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Appendix B - Examples of Online Content for Parents

Example 1 of Card reminding

Example 2 of Card reminding

First post of 10 ideas for what you can do while reading to your child

10 Ideas of what you can do while reading to your child:

1 **Read by talking** with your child about what the characters are doing, what is happening, and what they think will happen next.

2 **Ask questions** about the illustrations, names of objects, and the characters' feelings.

How to know if your child is enjoying it?

- Your child smiles, looks at you, and seems excited.
- The child responds when you ask or speak.
- The child offers ideas and sometimes takes the lead in the reading

BrincarLerVIP
Você é VIP para sua criança

playreadvip www.playreadvip.org/brasil

Pamphlet 5 Steps for Brain Development

5 STEPS FOR BRAIN DEVELOPMENT

PlayReadVIP
You are your child's VIP

Based on reciprocal turns

Relationships between children and adults that are responsive and attentive, with many back-and-forth interactions, build a strong foundation in the child's brain for all future learning and development.

This is called **"serve and return"**, and it requires participation from both.

Follow these 5 steps to practice serve and return with your child:

1 Notice the invitation and share the child's focus of attention

Is the child looking at or pointing to something? Speaking or making comments about what they observe? **That's a serve**. The key is to **pay attention** to what the child is focused on. You can't do this all the time, so **look for small opportunities throughout the day**, like when you're dressing them or waiting in line, for example.

Why?
By noticing these invitations, you'll learn a lot about the children's skills, interests, and needs. You'll encourage them to explore and strengthen the bond between you.

2 Return the serve by supporting and encouraging

You can **offer comfort** to children with a **hug and kind words, help them, play with them, or acknowledge their efforts.** You can make a sound or facial expression, like saying "Got it!" or smiling and nodding to let the child know you're noticing the same thing. Or you can pick up an object the child is pointing at and bring it closer.

Why?
Supporting and encouraging rewards the child's interests and curiosity. Receiving a response can never be stressful for the child. When you return an invitation, children know that their thoughts and feelings are heard and understood

Adapted from "Center on the Developing Child, Harvard University." Available at www.developingchild.harvard.edu.

Appendix C - Examples of Online Content for Teachers

Example 1 of Card reminding

Example 2 of Card reminding

Example of text message for teachers with 90-seconds video

Good morning, teachers! How are you? 🌞

In Monday's video, we shared tips on how to strengthen the habit of reading aloud and promote a closer connection between families and their children. We talked about the importance of engaging in dialogues with families, having direct conversations with the children, and encouraging book lending. 🎯🗣️📚

🔄 *Would anyone like to share their experience with putting these tips into practice?*

Reflecting on this exchange, I was reminded of the analogy with building blocks, where VOCABULARY is compared to blocks 🧱🧱🧱*, and children are seen as builders who carry and use these blocks to expand their linguistic understanding and expression. I'm going to share a snippet of this analogy here, take a look:*

As we saw, adults—whether family members or educators—play a crucial role by intentionally adding new "blocks" 🧱🧱🧱 *in their interactions, enriching the children's linguistic repertoire.*

If you'd like, feel free to share this analogy with the parents, showing how much talking, playing, and reading with the children contributes to their development! Additionally, we can offer practical tips on how to implement intentional conversations, as exemplified above!

Have a wonderful Friday! 💙🧡💖