



Brief Communication  
Comunicação Breve

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## Development of speech therapy app for parents

### *A construção de um aplicativo para uso dos pais na intervenção fonoaudiológica*

#### Keywords

Technology  
Child Guidance  
Child  
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Child Language  
Play and playthings

#### Descritores

Tecnologia  
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#### ABSTRACT

**Purpose:** To elaborate and show an innovative speech and language guidance program for smartphones, tablets, and computers, with technological support. The program aims to help parents of children at risk for language disorder in order to minimize the consequences of a developmental language disorder (DLD). **Method:** An app was developed to provide a dynamic interaction between the researcher and the families for at a distance intervention, aiming to reach the greatest number of children to promote language development in a broad, low-cost and effective way. **Results:** The content was organized in video-lessons (theoretical orientations were carried out in the form of video-lessons, taught by the researcher), videos (documentaries and videos from YouTube), reports (reports linked to sites specializing in child development), complementary content (cultural and leisure activities to be done in family) and activities (activities to stimulate the skills worked on in each week's video lesson proposed in the application). **Conclusion:** We created a remote orientation program proposing an innovative, technological, and motivating therapeutic environment compatible with the reality of today's families.

#### RESUMO

**Objetivo:** Elaborar e apresentar a construção de um programa inovador, com suporte tecnológico, de orientação fonoaudiológica a pais de crianças com risco para alteração de linguagem, com o propósito de minimizar as consequências de um transtorno do desenvolvimento da linguagem (TDL). **Método:** Foi desenvolvido um aplicativo para *smartphone, tablet* e computadores com o objetivo de apresentar um material inovador, tecnológico e motivador para que houvesse maior integração e dedicação durante o acompanhamento das famílias e a intervenção pudesse ser feita a distância. **Resultados:** O conteúdo foi organizado em videoaulas (orientações teóricas foram realizadas em forma de videoaulas, lecionadas pela própria avaliadora), vídeos (documentários e vídeos do site YouTube), reportagens (reportagens curtas vinculadas a sites especializados em desenvolvimento infantil), conteúdo complementar (atividades culturais e de lazer para serem realizadas em família) e atividades (atividades para estimulação das habilidades trabalhadas na videoaula de cada semana proposta no aplicativo). **Conclusão:** Foi possível elaborar um Programa de Orientação a distância capaz de criar um espaço terapêutico inovador, tecnológico e motivador compatível com a realidade das famílias atuais.

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## INTRODUCTION

Language is a complex and dynamic system of symbols, used in various ways to translate thoughts into communication. Language learning is determined by the interaction of biological, cognitive, social, and environmental factors. Its use evolves through historical, social, and cultural contexts. It requires a broad understanding of human interaction including nonverbal, motivational, and sociocultural roles<sup>(1)</sup>.

In speech therapy practice, playing provides resources to create and explore situations, allowing the mental representation of linguistic symbols and linguistic expression. It is used as a strategy to promote interaction with the child, favor affective processes and stimulate areas of learning<sup>(2)</sup>.

Developmental Language Disorder (DLD) refers to a series of language changes that can be diagnosed in the preschool years and persist throughout adolescence and adulthood. It is one of the most common developmental concerns in children, with prevalence rates varying with age and definition, but generally estimated in about 8% of primary school children<sup>2</sup>. DLD has a significant impact on social interactions and educational progress, as demonstrated in several studies. Thus, it is essential that speech therapists think of facilitating strategies in the intervention process of these pictures<sup>(3)</sup>. In addition, many communication disorders that occur in childhood could be avoided or minimized through simple measures of language stimulation, family guidance and early identification<sup>(4-5)</sup>.

Thinking about the continental dimensions of Brazil, its immense population and the prevalence of changes in language acquisition, it is of paramount importance to think about speech therapy intervention proposals that can reach a large number of people, aiming to promote language development in a broad and effective way<sup>(6)</sup>. The aim of this study is to develop and present an innovative program, with technological support, of remote speech therapy guidance for parents of children at risk of language alteration.

## METHOD

This study was approved by *Comitê de Ética e Pesquisa da Faculdade de Medicina da Universidade São Paulo* (no. 256/15).

The program was called “*Playing Space*”. We developed a mobile web application for smartphone, tablet, and computers with the objective of presenting an innovative, technological and motivating material to have greater integration and dedication during remote follow-up of the families. It is in Beta version and the final version will be released after using and revisions that are necessary for the final release.

To develop the application, we sought a platform that would provide resources for dynamic interaction between families and the researcher. In order to provide theoretical information in the form of classes, the application should be able to contain videos; for daily orientation activities, allow written and imagery content; to follow-up the participants and give them feedback, and offer a space for comments and

answering questionnaires before and after the program. In addition, these answers should be tabulated automatically, to allow adapting the proposal to learning provided by the interaction with the participants.

Other requirements of the application were accessibility and usability. That is, the largest number of people should be able to access the application (use it on various devices). The requirement of usability aimed to make interaction with the application easy, in order to meet people with distinct fluencies in technology.

Finally, we chose the application development platform Strikingly® (<https://www.strikingly.com/>) because it has the necessary features and a support service that assisted in its use.

## RESULTS

For the elaboration of this material, we researched scientific literature, books, websites specialized in child development and existing materials aimed at groups of parents. We tried to maintain a simple and clear language to reach families with different degrees of school level, but with sufficient scientific content to help parents understand the development of language and its deviations. The material was organized into five parts:

### 1) Video lessons

The theoretical orientations were carried out in the form of video lessons, taught by the researcher herself. Three essential themes were chosen to be addressed, so that parents could reach the theoretical basis necessary to perform language stimulation of children<sup>7</sup>: the importance of playing in language development, auditory processing skills and communicative skills. Each video has an average of five minutes and a clear and didactic design to optimize parents' comprehension.

### 2) Videos

Thinking of expanding the introduction of content to families, we chose two documentaries and two videos from YouTube®, which were also included in the *Playing Space*.

In the first week, we suggested the documentary suggested “*Tarja Branca*”, produced by *Maria Farinha filmes* and directed by Cacau Rhoden. The theme addressed the importance playing has on the formation of social subject, and how we lose it due to the dynamics of modern life in large cities. In the second week, we suggested the documentary “*O início da vida*”, also by the producer *Maria Farinha filmes* and directed by Estela Renner. The central theme is early childhood, the importance of the stimuli received, and the connections created in it. In the third and fourth weeks, two short videos were chosen to assist families in the activities to be performed in these weeks.

The first video, “*Dicas para contação de histórias*”, starred by Ana Celina, of *Grupo Trota Mundo*, was published by TV Itararé channel. During the video, four key tips are given for parents to learn how to tell stories: enjoy listening, use gestures,

use voice expression, and enjoy reading. The second is called “*Jogo de boliche: brinquedos de material reciclado*” produced by *Guia Infantil Brasil*. This video helps parents get new ideas about making toys from scrap and low-cost materials.

### 3) Interviews

All four weeks of intervention propose reading short interviews related to websites specialized in child development. We chose interviews because they were built with a simple language and accessible to parents.

The first week, we chose the article published by *Instituto Alfa e Beto* on the website *Aliança pela infância* and is called “*Brincar é mais importante que as atividades escolares*”. It talks about a study from the University of Cambridge in the United Kingdom, which reveals that, to acquire school skills, the child needs to explore playing, to learn to control their attention and emotions.

In the second and third week, we used the blog “*Criança em Desenvolvimento*” of the newspaper *Estadão* as a reference, which was developed by health professionals. The texts chosen were “*Conversando com quem?*” and “*Pra que essas orelhas tão grandes?*” written by speech therapist Marta Gimenez Baptista in 2015. One addresses the early and exaggerated use of electronic equipment by children in the language development phase and the other explains the importance of hearing in the period of language development.

In the fourth and last week, we selected a short text from the website of the Maria Cecilia Souto Vidigal Foundation that explains about child development written in 2013, called “*O que é Desenvolvimento Infantil?*”.

### 4) Supplementary Resource

In the 1st and 3rd weeks, two complementary resource files were inserted into the application. In the 1st week, as the theme addressed was free playing, parents were given a list of parks in the city of São Paulo, so that they could choose some to walk with their children over the weekend. In the 3rd week, after addressing the importance of auditory processing of children, a list of cultural activities that would take place at the weekend was suggested. In the other weeks, there was no such feature.

### 5) Activities

Each activity was designed under the following aspects: easy to understand and performed by families, appropriate to the age groups of Early Childhood and stimulating for the skills worked in the video lesson corresponding to the week in question. All were checked in the literature<sup>(8)</sup>.

The 1st week was to remember old games, to rescue the past of families in a pleasurable and stimulating way. The games of the 2nd week are related to acquisition and development of language. The 3rd week presented comprehension and auditory processing activities, based on an informal auditory skills training study on children with alterations in central

auditory processing. The 4th week addressed the theme of communicative skills.

Table 1 provides an overview of the activities.

**Table 1. Content addressed**

Week	Theme	Activities
1	Remembering children games	Batata quente <i>Passa-anel</i> <i>Escravos de Jó</i> Hide-and-peek Jumping rope Recreation activity Free activity
2	Language development	Cooking games Cars Playing house <i>Morto-vivo</i> Imitating animals Recreation activity Free activity
3	Central auditory processing	Simon says Statue game Head, shoulders, knees, and toes Auditory processing activities (story) Cultural activity Free activity
4	Communicative skills	<i>Marcha soldado</i> Bowling Puzzles of 4 to 6 pieces <i>Um pra você um pra mim</i> Costume party Recreation activity Free activity

The program will start with a welcome SMS indicating the first game, requesting a report on the proposed activity and a link to the website, which includes the instructions for performing the games and the extra activities. That is the procedure for the week.

SMS will also contain creative and motivational messages for families, according to the suggested activities, to make the process more dynamic and fun.

On Fridays, in addition to the activities, families will be suggested to watch the video lessons on the website. On Sundays, families will be asked to answer a short question about the development of children’s communication and their performance in the activity.

All messages sent will compose a database daily read and answered immediately by email.

Figure 1 shows some pages of the application.

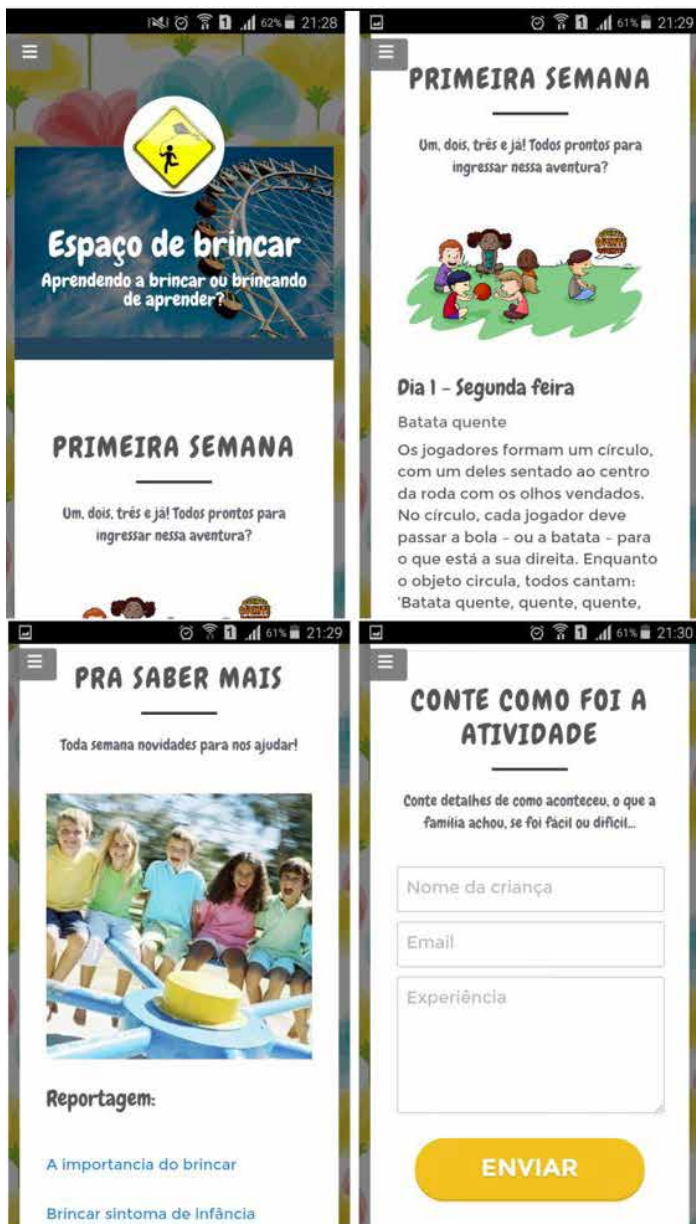


Figure 1. Images of the application

## DISCUSSION

The fact that we can be in contact 24 hours a day anywhere in the world and the great access to information over the Internet, allowing to collect information on any subject in a few minutes from anywhere, have indeed changed the way we live. Therefore, care and learning integration requires the development of adequate health actions, compatible with the reality of families. These include practices with methods that represent people's daily lives in the scene, based on their own experiences; dialogue opportunities for individuals to explain their real difficulties and their perception of the resources they deal with in each occasion; frequent situations that place health team and patient in direct relationship and promote the

commitment and implication of both in the search for solutions to the problems in question<sup>(9)</sup>.

It is essential that families understand about language changes and learn activities they can perform at home. Therefore, parents become partners and not just observers of the therapeutic process. Children's verbal communicative skills improvement also increases the quality of parents' playing time with their children as well as new situations and interaction with new objects<sup>(5)</sup>.

The use of visual resources, especially videos, are an excellent pedagogical tool. From them, we can address themes with high educational content in a dynamic and interesting way. Watching videos awakens creativity stimulating the construction of multiple learnings and allows the exploration of sensitivity and emotions of those who are watching<sup>(10)</sup>.

Storytelling is a strong language stimulation tool that parents can easily carry out at home<sup>(11)</sup>. Listening to stories performed, the child imagines it internally through the clues given by the voice and expression of the teller. It recalls memories of a time experienced by them or not, times and places of the characters they know and those who have only heard of, but who are already part of their existence. Thus, they become co-authors of the story, since they begin to relive significant experiences linked to the meaning of their own life. By playing with stories, they can transport themselves, symbolically, to the imaginary world to which these games lead us, where anything is possible. The child plays interacting with their imagination, inventing solutions, elaborating conflicts, experiencing roles<sup>(4)</sup>.

The choice of the pages and articles that make up the *Playing Space* was based on a study<sup>(12)</sup> that proposes indicators of quality and reliability of a website. This analysis has three main axes to verify when searching for a non-academic source: reliable authorship, quality of information and usability of the page. In addition to this information, they propose a protocol to analyze information about the page.

The activities suggested by the application aim at helping parents organize their own time within the daily routine and exercising critical reflection about the meaning of free time and what to do in it. Thus, it avoids dealing with domestic life as an extension of working life<sup>(13)</sup>. Families are a clearly important social context for individuals, and family interaction patterns are crucial for the development and well-being of children. When they can meet the needs of their members, they promote the acquisition of skills that, in turn, make parents able to find time, energy and resources for the well-being of their members<sup>(4)</sup>.

It is essential to create space for listening to families and understand their needs during the therapeutic process. This enables them to access and recognize the importance of the intervention, besides ensuring its effectiveness<sup>(14)</sup>. The text box of the application acts as a direct contact way for families with the therapist, to understand and consider the elucidations presented so they could be more involved in the intervention program. With this, it is possible to identify the best models and programs according to the different problems of children and families.



The *Playing Space* emerges to a group of family-focused interactionist intervention studies that, corroborating with the literature, may present promising results. It is expected to help on family strengthening and in the development of the child's communicative skills. The focus on theoretical and practical aspects as well as a space for doubts and discussions are essential in this type of intervention. This exchange between families and the researcher contributes to strengthen bonds and strengthen their partnership, smoothing the stress experienced by these families.

In indirect intervention programs, parents are taught to be language facilitators for their children. There is conclusive evidence that this type of program improves speech and language outcomes from birth to three years old. Specifically, programs have a great effect on the expansion of phonetic inventories of speech production, syllable structure repertoires, and children's vocabulary. All these effects can influence lexical development. In addition, it helps in the development of parents' communicative behaviors, which allows the child to conduct a conversation and talk about something that interests him/her (15).

There is currently considerable concern to find a balance between the cost-benefit ratio of intervention programs and the responsibility for ensuring the quality of life of the most vulnerable children and families. Thus, it is necessary to evaluate the programs to constitute a continuous process that generates knowledge and promotes the quality of practices (3).

## CONCLUSION

An indirect intervention program, to have functionality and effectiveness, require that parents receive theoretical content to understand child development and its deviations, being able to organize the activities proposed within the family routine, and having a listening place where the therapist can understand the child's real demand. We developed an innovative, technological and motivating therapeutic space program compatible with the reality of current families.

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## Authors' contributions

*CHC* participated in the study idealization, collection, analysis and interpretation of data and paper writing; *DRMA* participated, as advisor, in the study idealization, analysis, interpretation of data and paper writing.