

THEMATIC SECTION:

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SEÇÃO TEMÁTICA:

EDUCAÇÃO EM TEMPOS DE PANDEMIA

SECCIÓN TEMÁTICA:

EDUCACIÓN EN TIEMPOS DE PANDEMIA

THE EFFECTS OF THE PANDEMIC ON INEQUALITIES OF LEARNING OPPORTUNITIES IN EARLY CHILDHOOD EDUCATION

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ABSTRACT

This article discusses the effects of the COVID-19 pandemic on the learning opportunities of children enrolled in preschool in the Brazilian context. The preliminary results presented are based on ongoing research including a sample of 77 public, subsidized non for profit and common private schools and 2,070 children in two cities. Data collected from questionnaires to teachers and parents are used to map the schools' pedagogical strategies, their communication with families, and the home learning environment of families with different socioeconomic profiles. The results show inequalities in access to learning opportunities and possible implications for the increase of educational inequalities at the beginning of compulsory schooling.

KEYWORDS: EARLY CHILDHOOD EDUCATION • COVID-19 • EDUCATIONAL OPPORTUNITIES • SOCIO-EDUCATIONAL INEQUALITIES.

A PANDEMIA E AS DESIGUALDADES DE OPORTUNIDADES DE APRENDIZAGEM NA EDUCAÇÃO INFANTIL

RESUMO

O artigo discute os efeitos da pandemia de covid-19 nas oportunidades de aprendizagem de crianças matriculadas na pré-escola no contexto brasileiro. Apresentam-se resultados preliminares de uma pesquisa em andamento sobre uma amostra de 77 escolas das redes pública, conveniada e privada, em duas cidades, e 2.070 crianças. Utilizam-se dados coletados com a aplicação de questionários aos professores e responsáveis para mapear as estratégias pedagógicas e de comunicação das escolas com as famílias e o ambiente de aprendizagem em casa de famílias de diferentes perfis socioeconômicos. Os resultados mostram desigualdades de acesso às oportunidades de aprendizagem e possíveis implicações para a ampliação das desigualdades educacionais no início da escolarização obrigatória.

PALAVRAS-CHAVE: EDUCAÇÃO INFANTIL • COVID-19 • OPORTUNIDADES EDUCACIONAIS • DESIGUALDADES SOCIOEDUCACIONAIS.

LA PANDEMIA Y LAS DESIGUALDADES DE OPORTUNIDADES DE APRENDIZAJE EN LA EDUCACIÓN INFANTIL

RESUMEN

El artículo discute los efectos de la pandemia de covid-19 en las oportunidades de aprendizaje de niños matriculados en la preescola en el contexto brasileño. Se presentan resultados preliminares de una investigación en marcha sobre una muestra de 77 escuelas de las redes pública, conveniada y privada, en dos ciudades, y 2.070 niños. Se utilizan datos recogidos de la aplicación de cuestionarios a profesores y responsables por mapear las estrategias pedagógicas y de comunicación de las escuelas con las familias y el ambiente de aprendizaje en casas de familias de distintos perfiles socioeconómicos. Los resultados muestran desigualdades de acceso a las oportunidades de aprendizaje y posibles implicaciones para la ampliación de las desigualdades educativas al inicio de la escolarización obligatoria.

PALABRAS CLAVE: EDUCACIÓN INFANTIL • COVID-19 • OPORTUNIDADES EDUCACIONALES • DESIGUALDADES SOCIOEDUCATIVAS.

INTRODUCTION

In the beginning of school year 2020, Brazil, like many countries, interrupted in-person activities in all schools in an effort to slow down rates of infection by the new coronavirus, SARS-CoV2 (COVID-19), in the country. By late April, measures that partially or fully closed schools affected 69.3% (1,212,977,511) of the total of students enrolled in schools around the world (UNESCO, [2020]). This article discusses the effects of the pandemic on inequalities in the learning opportunities of children attending preschool in the Brazilian context.

The pandemic and the closure of schools created huge challenges for schools, teachers and families, in addition to the sanitary concern. Children were deprived of the opportunity to interact in person with their peers and teachers, and it is reasonable to assume that many were deprived of their contact with family (particularly grandparents and other relatives who might be at higher risk from the disease) and friends. It is also important to consider that the ways in which families adopted social distancing varied hugely, and it is plausible to suppose that the more vulnerable families are facing more challenging conditions, which can impact educational inequalities (CAMPOS; VIEIRA, 2021). In addition, social distancing and the long periods spent at home can cause much stress and anxiety in adults and in children (PASCAL *et al.*, 2020; DEFEYTER *et al.*, 2020; FUNDAÇÃO CARLOS CHAGAS *et al.*, 2020).

Regarding early childhood education, several studies conducted prior to the pandemic indicate that children's initial development and their progress during early school years are critical for their later success. The offer of quality early childhood education works as a protection factor, particularly for vulnerable children (SYLVA *et al.*, 2010; SAMMONS *et al.*, 2008; PEISNER-FEINBERG *et al.*, 2001). While there is a growing number of published works that aim to estimate the impacts of the COVID-19 pandemic on the development and well-being of small children and on educational inequalities, the magnitude of these effects is not evident, particularly in Brazil, with its great social inequality combined with a long period of interruption of in-person school activities.

Given this scenario, this article presents preliminary results of the ongoing study titled *O impacto da pandemia de covid-19 no desenvolvimento das crianças durante os dois primeiros anos na escola* [The impact of the COVID-19 pandemic on the development of children during their first two years in school].¹ The study analyzes data from a sample of 77 public, subsidized non-profit and common private schools and 2,070

1 The study was approved by the Research Ethics Committee CFCH/UFRJ (CAAE: 33865520.2.0000.5582, Opinion No. 4,228,330) and is funded by the Maria Cecília Souto Vidigal Foundation. The authors are grateful for the partnership and support of the education systems, principals, teachers and parents who responded to the questionnaire designed by the research team at the UFRJ.

children enrolled in them in two Brazilian cities. The research project intends to map schools' pedagogical strategies and the forms of communication used by schools and teachers with families during the COVID-19 pandemic, and to estimate the impact of the interruption of in-person activities during 2020 on the well-being and development of children attending preschool, regarding three dimensions: cognitive development; physical/motor development; and socioemotional development.

The data we present describe the pedagogical strategies used by the schools during the pandemic and how they varied according to the type of school/education system. Home learning opportunities, as reported by parents, are also analyzed considering the different socioeconomic profiles of families. The article is divided into four parts besides this introduction. The first part discusses recent academic output on the effects of the pandemic on children's and adolescents' learning and development opportunities. The second part presents the design of the study, the context of the two municipalities, the sample and the instruments used to collect data for the still ongoing research. Then we present preliminary and descriptive analyses of the data collected through questionnaires to teachers and parents of children enrolled in preschool regarding learning opportunities during the school closure period. Finally, in the conclusion, we discuss the possible effects of the pandemic on child development and on the increase of educational inequalities at the beginning of compulsory schooling, and how studies that aim to map this phenomenon can help schools and education systems when schools reopen.

WHAT DO WE ALREADY KNOW ABOUT THE EFFECT OF THE PANDEMIC ON LEARNING OPPORTUNITIES?

The pandemic and the closure of schools have created huge challenges for education systems, school managers, teachers and families, in addition to the sanitary concern. The sudden change in the routine, the impossibility to interact with teachers and classmates, the obstacles imposed by social distancing policies, the fear of the virus and the risk of income loss or unemployment can contribute to increase stress and anxiety in adults and in children. (CAMPOS; VIEIRA, 2021, FUNDAÇÃO CARLOS CHAGAS *et al.*, 2020). According to Campos and Viera (2021), in the Brazilian context, the closure of schools affected the routine of 8.9 million children aged 0-5 years. This figure represents 93% of children aged 4-5 years and 34% of those aged 0-3 years who are enrolled in preschool and daycare, respectively. According to the School Census 2020 (BRASIL, 2021), public education systems, particularly municipal ones, accounted for 73.6% of enrollments in early childhood education, and private schools for the remainder 26.4%, the latter being divided into subsidized not for profit establishments (8.7%) and common private establishments (17.8%).

It is also relevant to mention that different schools and public education systems have chosen different strategies to mitigate the impacts of school closure. Several tools that allow online interaction are being tested and used, such as websites with proposed activities and online meetings that allow interaction between teachers and children, and also between schools and families. However, it must be stressed that not all schools, teachers and families have access to broadband internet connection and to devices like tablets and computers at home. The lack of material and infrastructure that allow virtual interaction may widen educational inequalities (BARBIERIA; CANTANELLI; SCHMALZ, 2021; FUNDAÇÃO CARLOS CHAGAS *et al.*, 2020; OLIVEIRA *et al.*, 2021).

We still know little about the impacts of the COVID-19 pandemic on the development of small children. Because it is an unforeseen event, most of the published studies present accounts and impressions by different actors about the impacts that the interruption of in-person activities and the use of remote learning had on child development. Other studies conducted systematic reviews focusing on past events that bear some relation with the COVID-19 pandemic and its possible effects on educational opportunities.

Over the second half of 2020, systematic reviews and studies with secondary data were published in European countries with the purpose of answering two fundamental questions: What is the effect of school closure on learning and on educational inequalities? And what is the impact of remote learning (EDUCATION ENDOWMENT FOUNDATION, 2020a, 2020b; HALTERBECK *et al.*, 2020; ENGZELL; FREY; VERHAGEN, 2020; MALDONADO; DE WITT, 2020)? Roughly speaking, the results of all studies suggest that the current scenario, with school closure, will deepen educational inequalities. For example, in England, the systematic review produced by the Education Endowment Foundation (2020a) indicates a reversion of the scenario observed in the last decade, with an increase in differences considering vulnerable and non-vulnerable children. Engzell, Frey and Verhagen (2020) analyzed secondary data collected in the Netherlands in 2020 and compared them with cohorts of previous years in a robust research design that is suitable for causal inferences. In all, 350,000 students were included in the analysis and the results suggest that the effects of remote learning were very small (neglectable from the pedagogical point of view). In Belgium, Maldonado and De Witt (2020) highlight an increase in educational inequalities in the country with the closure of schools. This means that the impact of school closure is more severe for students in a vulnerable situation.

Halterbeck *et al.* (2020), in a report for the Sutton Trust Foundation, estimated the impact of school closure on the learning and future income of students in the United Kingdom. The results, again, suggest that boys and girls in a vulnerable situation will be more heavily affected by the closure of schools. The impact on

learning will be greater for this group, with consequences for increased dropout rates and smaller chances of social mobility.

Finally, in Brazil, the study conducted in the state of São Paulo found a strong and negative impact both on language and mathematics for students enrolled in the 5th grade. For the 9th grade, the impacts were also negative, but smaller than those found for the 5th grade (SÃO PAULO, 2021).

The studies above analyze data for students in primary and lower secondary education. However, it is reasonable to assume that the effects observed in students aged 6-14 years are similar to those for children in early childhood education. For example, recent studies observed effects of the pandemic and of social distancing measures on the routine, well-being and socioemotional development, based on parents' accounts, on children aged 2-4 years in the United Kingdom, and on those up to 6 years old in Latin America (PASCAL *et al.*, 2020; GUERRERO, 2021). The study conducted in the United Kingdom also showed that most parents sought various types of support during lockdown to develop activities with their children (educational TV shows, mobile applications focused on parenthood, etc.). However, only 28% reported to have received support from early childhood education establishments via remote services, and this value is higher among middle class parents compared with working class parents.

Another study, conducted in the United States, found an impact on learning opportunities for children attending preschool, particularly in low-income families (BARNETT; JUNG, 2020). On the one hand, the more vulnerable children had less access to remote and in-person activities provided by the schools and, on the other, the remote option did not allow activities with concrete experiences, an important characteristic in the learning of children in this age group. The report of the study, with data from a cross-country survey administered to 945 households with children aged 3-5 years, indicated that before the pandemic, 61% of children in this age group attended early childhood education programs. With the pandemic, this attendance declined to 30% in remote programs and to 8% in the in-person mode. The inequalities in services persisted during the pandemic, with a smaller attendance of children of parents with less education in both remote and in-person modes. These parents reported to have received limited and infrequent support from the preschool establishment their children were enrolled in. Finally, even with support from schools, the time dedicated by the less educated parents to learning activities (such as telling stories, reading books, doing arts and crafts, singing, working on letters and numbers) did not change significantly during the pandemic, which indicates that these parents were not able to change their home routine to increase learning opportunities for their children.

We should also consider that the results above are mostly for European countries and the U.S., i.e., contexts with lower levels of poverty and social inequality. The

problems observed in these countries to implement remote learning, as well as the challenges to reopening schools, are possibly smaller than those in Brazil. In addition, Brazil faced one of the longest school closure periods: starting in March 2020 and with a few exceptions that reopened in October – usually schools serving children of higher socioeconomic status. Even these schools had an intermittent reopening with the increase in COVID-19 transmission rates and, according to estimates, only 3% of students aged 4-17 years were attending school by the end of 2020 (PALHARES, 2020).

In Brazil, Campos and Vieira (2021) carried out a review of reports and ongoing research about the effects of the pandemic on education in the Brazilian context. The authors point out that studies focused on early childhood education are scarce. Nevertheless, they indicate a few tendencies that help understand children's access to learning opportunities in different contexts during the pandemic. For example, the research report on the survey conducted by the Carlos Chagas Foundation indicates that 60% of early childhood education teachers reported efforts to provide families with guidance for encouragement and monitoring of home learning activities. However, a study conducted by the Península Institute observed that only 47% of early childhood education teachers said they kept in touch with the children in their classes. With regard to the form of access, in early childhood education, WhatsApp was reported as the main communication channel with children; social networks, virtual learning environments and phone calls were less frequently mentioned. However, these strategies varied between the education systems. Public school teachers reported using mainly WhatsApp, followed by social networks, while private school teachers mentioned more frequently the use of learning environments, followed by WhatsApp (FUNDAÇÃO CARLOS CHAGAS *et al.*, 2020).

The chosen communication channels reflect schools' infrastructure and teachers' ability to offer remote content, as well as the access of families of different socioeconomic status to resources that allow remote learning. Regarding connectivity, while only 31% of students in public schools had access to computers/tablets and broadband internet connection, among private school students, this value was 77%. In addition, according to a survey carried out in May and June 2020 with Departments of Education, 25% of municipalities in the North and Northeast regions reported they had not adopted any strategy to reach students during the school closure period, while in the South and Southeast, all municipalities reported developing some kind of alternative (CAMPOS; VIEIRA, 2021).

The decrease in learning opportunities provided by schools, particularly to more vulnerable children, is a worrying fact, particularly considering the evidence already produced by studies that indicate that attendance in preschool contributes to the development of children regarding several dimensions and is

associated with longer educational trajectories, in addition to being a protection factor, especially for children of lower socioeconomic backgrounds. These long lasting effects are observed in particular for attendance in good quality schools, which are examined through evaluation instruments that assess the quality of early childhood education environments and/or of interaction between teacher and children (DAMIANI *et al.*, 2011; CAMPOS *et al.*, 2011; PEISNER-FEINBERG *et al.*, 2000; SYLVA *et al.*, 2010; SAMMONS *et al.*, 2008; TYMMS *et al.*, 2009; NICHD, 2006; HOWES *et al.*, 2008). Besides, studies indicate that the home learning environment,² i.e., learning opportunities that adults create for children in the family context, is a predictive factor of learning in language and mathematics and of the socioemotional development of children in the preschool stage (SAMMONS *et al.*, 2008; SYLVA *et al.*, 2010; BARTHOLO *et al.*, 2020; KOSLINSKI *et al.*, 2021). In a time when social distancing measures limit both interaction with teachers and the learning opportunities provided by early childhood schooling, the home learning environment becomes even more critical for children's development. Thus, we can expect that the inequality in access to support provided by schools during the pandemic, which was reported by several studies, will have implications for widening the education inequalities that already existed before the pandemic.

DESIGN, SAMPLE AND INSTRUMENTS

The data presented in this article are part of a study titled *O impacto da pandemia de covid-19 no desenvolvimento das crianças durante os dois primeiros anos na escola* [The impact of the COVID-19 pandemic on the development of children during their first two years in school] which is still ongoing (it is due to finish in November 2021). Initially, this section presents a description of the samples and stages of the study, of the instruments that will be used in each stage and of the research design that will be used to observe the impact of the pandemic on the development of children in preschool. Then we detail the data that have been collected in stages 1 and 2 of the study, which form the basis for the analysis presented in this article.

According to our initial forecast, the study would be conducted in two samples, with 2,070 children enrolled in 77 public, subsidized not for profit and common private schools in two municipalities, one located in the Southeast region, and one in the Northeast. The schools and part of the children selected for the impact study about the COVID-19 pandemic are the same ones that participated in a longitudinal study conducted in 2019, which sought to understand factors associated with child development during the first few years of compulsory schooling (KOSLINSKI; BARTHOLO, 2020).

2 The home learning environment is associated with active engagement in learning activities with children, such as reading books, games involving counting, numbers, alphabet letters, painting, drawing, music, poems and rhymes, among others (SYLVA *et al.*, 2010; SAMMONS *et al.*, 2008).

In the Northeastern city, the sample is representative of children enrolled in preschool in the public system of a medium-sized municipality. All schools that offer this education stage were included, and the classes and students were randomly selected considering the size of each school. The criterion established that one out of every three classes of grades 1 or 2 of preschool would be selected at random to participate in the study. The final sample of the 2019 study was formed by 676 children distributed over 120 classes of the 1st year and 2nd year of preschool. For each cohort of students (1st and 2nd year of preschool), data were collected about cognitive and motor development at the beginning and at the end of the school year. The present study sought to follow the children who were enrolled in the 1st year of preschool in 2019, and it included a new sample of children who were enrolled in the 1st year of preschool in 2020.

The design of the study in the Southeastern city is identical to the one above, and the same instruments were used to collect data. The only difference lies in the characteristics of the sample. Initially, the researchers planned to obtain a simple random sample of subsidized not for profit schools and a random sample of private schools stratified by the value of their fees. The schools would be randomly selected according to the profile of students, with the value of the fee as a proxy for students' socioeconomic status, considering four groups: group 1, formed by subsidized not for profit private schools; group 2, formed by private preschools with fees up to R\$300; group 3, formed by preschools with fees between R\$301 and R\$1,000; and group 4, formed by preschools with fees above R\$1,000. Only for group 1, of not for profit schools funded by the municipality, was it possible to obtain a simple random sample. For the other strata, we had difficulty making initial contact with many schools.

The initial protocol for contact included an e-mail, a letter and a phone call. A few schools never returned the request, which made it impossible to make an in-person visit or hold a virtual meeting to present the study that would start in the first months of 2019. The final sample of common and subsidized not for profit private schools that participated in the 2019 study included 27 schools, some of which had more than one unit, thus totaling 36 school units. All classes and children enrolled in preschool in the 27 schools were included in the sample (approximately 1,400 children) (CASTRO, 2021). Until now, 18 schools distributed over the four strata have authorized us to conduct the new impact study.

Describing the sample is important to stress the limits of data for future comparisons between the education systems and the cities. First, it should be stressed that the analyzed data are not representative of the country or even of a region. The samples of the public system and of subsidized not for profit schools were selected at random, and they are representative of the universe of this types of schools in the respective cities. The sample of common private schools was selected

by convenience sampling. However, we were able to select schools in the three above mentioned strata, thus ensuring a diversity of socioeconomic profiles of participant families.

The study started collecting data in September 2020 by administering a questionnaire to principals, teachers and parents of children in the sample, and we plan to complete the last data collection stage in the second semester of 2021, as described below. Following guidance by the Research Ethics Committee (CEP), in view of the challenges of the COVID-19 pandemic, the collection of data in the first three stages was performed remotely via online questionnaires or phone calls.

The impact study about the effects of the COVID-19 pandemic on the well-being and development of children has four data collection stages. Stage 1 was carried out from September to December 2020, starting with questionnaires administered to principals and teachers in the two samples of the study. The questions are centered on school's pedagogical strategies, as well as on their strategies regarding communication with and support to families during the school closure period. Other relevant family support strategies (food distribution programs or other actions to ensure food security for children) were also investigated. The questionnaires allowed collecting information on how teachers and principals perceived the impact of the pandemic on the development of children regarding several dimensions, as well as on the school routine in the resumption of in-person activities. Finally, the questionnaires included items about: mental health of teachers and principals (an instrument formed by questions from these questionnaires: General Anxiety Disorder/GAD-7, Patient Health Questionnaire/PHQ-9); and impacts of the pandemic on the health and income of teachers/principals and their families (questions adapted from *The Coronavirus Health Impact Survey*).

Stage 2 of data collection focuses on the parents of children in the sample. Items included questions about the socioeconomic profile of parents, the home learning environment, and information about the mental health of children and their parents (Strengths and Difficulties Questionnaire/SDQ, Generalized Anxiety Disorder/GAD-7, Patient Health Questionnaire/PHQ-9), about the effects of the pandemic on the routine and well-being of children, and about the health and income of the families of children enrolled in preschool (questions adapted from *The Coronavirus Health Impact Survey*). The questionnaire to the parents of children in private schools also includes questions about the children's attendance in live activities provided by the schools, and about how their parents perceive such activities. This stage of data collection is still ongoing, having begun in September 2020.

Stage 3 included the collection of qualitative data based on in-depth interviews with teachers and parents. The goal was to gain further insight into aspects observed in the questionnaires which might help understand home routines, the changes and hindrances faced during school closure and in the resumption of in-person school

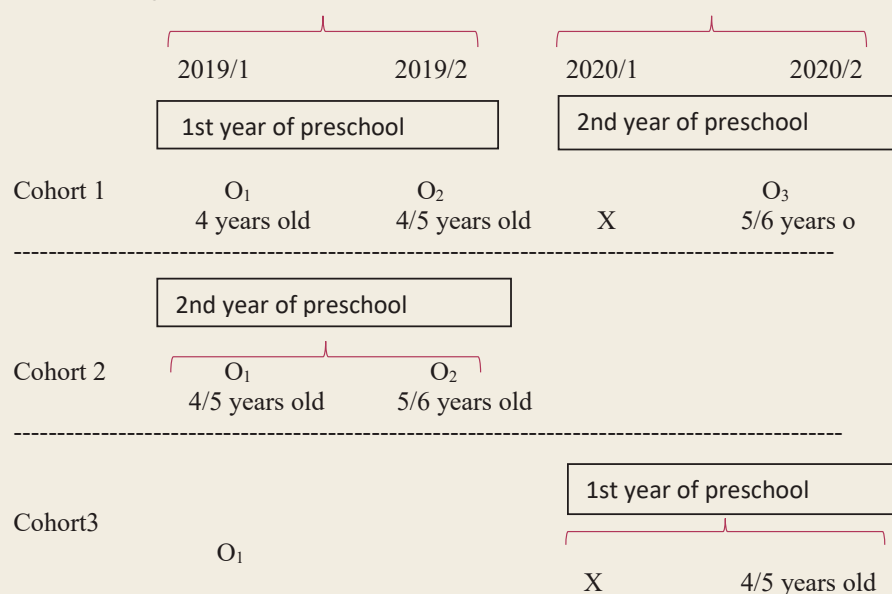
services, as well as more qualitative aspects about the well-being of children. This stage was carried out from March to June 2021.

Finally, Stage 4 collects measurements of children's cognitive, motor, social and emotional development, based on their teachers' impressions. This last stage was carried out in the first semester of 2021 for the private and subsidized not for profit schools, and will be conducted in the second semester of 2021 for the public schools.

Data about the children's cognitive, socioemotional and motor development already collected in 2019, and the forecasted collection of the same data in Stage 4 of this study (collection was initially scheduled for the end of school year 2020) indicate the opportunity to perform a natural experiment with the random sample obtained in the public and subsidized not for profit schools. The new data about the cognitive, socioemotional and motor development collected in Stage 4 of this study will be combined with those obtained in 2019, using the Rasch model, which will allow a longitudinal analysis of all data (BOONE, 2016).

The present project initially planned to collect new data in the end of 2020 for children in cohort 1 (by 2020, they would be finishing the 2nd year of preschool, and in 2021 they would be entering the 1st grade of primary education) and for a new sample of children (cohort 3) who were enrolled in the 1st year of compulsory education/preschool. The new data collection could not be carried out in the end of school year 2020, since most schools did not resume in-person activities. However, considering the particulars of the research design presented in Figure 1, the changes in the data collection period will not affect the internal validity of the study. It will be possible to estimate the effect of the interruption of in-person activities on the development of children by making the necessary adjustments for maturation effect.

FIGURE 1 – Scheme of data collection in 2019, forecast for the collection in 2020 and the study's overall design



Source: Prepared by the authors.

Until August 2021, only data for Stages 1, 2 and 3 were collected for both samples. Table 1 presents the collected and forecasted numbers of observations and response rates, according to questionnaire type, in Stages 1 and 2 for both samples.

TABLE 1 – Forecasted and collected number of observations, according to questionnaire type, in Stages 1 and 2 of the study for the samples of private and public schools

QUESTIONNAIRES	SAMPLE OF PUBLIC SCHOOLS			SAMPLE OF PRIVATE SCHOOLS		
	FORECASTED	COLLECTED	RESPONSE RATE	FORECASTED	COLLECTED	RESPONSE RATE
Principals	41	40	97.6%	18	16	88.9%
Teachers – preschool	188	178	94.7%	77	52	67.5%
Teachers – daycare	194	91	46.9%	64	30	46.9%
Parents	676	511	75.6%	910	412	45.3%

Source: Data from the study.

Regarding the collection of data for the sample of public schools, the response rates for preschool teachers and parents were 94.7% and 75.6%, respectively. These rates were higher than those obtained for the sample of private and subsidized not for profit schools: 67.5% for preschool teachers and 45.3% for parents. For the sample of 18 private and subsidized not for profit schools, we obtained responses from teachers for 17 of them.

THE PANDEMIC AND LEARNING OPPORTUNITIES DURING PRESCHOOL: A PRELIMINARY ANALYSIS

In order to map learning opportunities during the pandemic and in particular during the school closure period, we used data collected through questionnaires administered to preschool teachers (samples of public and private schools) and to parents/guardians (sample of public schools), which were collected between September and December 2020 – Stages 1 and 2. The descriptive and still preliminary analysis³ was divided into three blocks: activities done by schools during school closure; communication with families; and home learning environment.

We stress the limitation of comparisons between public and private schools due to the characteristics of the samples, and also considering the fact the study is still ongoing.

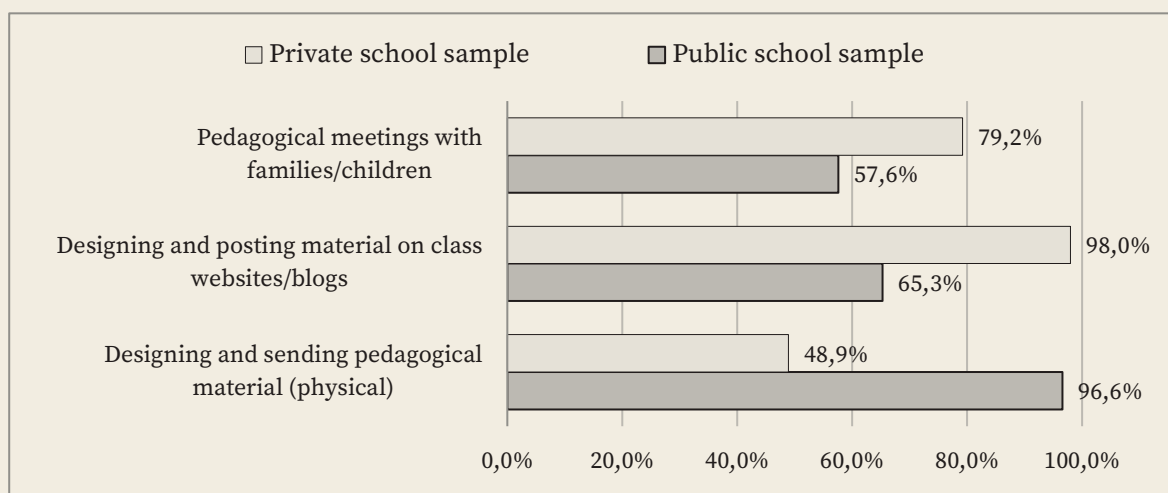
Learning opportunities provided by schools: reaching and engaging children

The questionnaire administered to teachers in the two samples of the study

3 The collection of data is still ongoing, and the analysis refers only to the responses of teachers and parents who have already responded the questionnaires until now.

contain a section about work organization which sought to map the most frequent activities during the pandemic. Responses refer to September 2020, when both public and private schools were closed for in-person activities. Graph 1 presents teachers' responses regarding the pedagogical activities they did.

GRAPH 1 - Percentage of responses by preschool teachers in each sample, according to the most frequent pedagogical activities during school closure in the pandemic



Source: Data from the study.

We observe that almost 80% of teachers in the sample of private schools reported holding virtual pedagogical meetings with families and children in their classes, and an even greater proportion (98%) reported designing and posting material on their class or school blogs and website. These activities were less frequent among teachers in the sample of public schools: a little more than half (57.6%) held pedagogical meetings, and approximately two-thirds (65.3%) designed and posted material on virtual platforms. However, nearly all teachers in the public school sample (96.3%) said they designed pedagogical material to send to children, while only half (48.9%) of teachers in the private school sample reported doing this type of activity during the school closure period.

The public schools in the sample do not provide synchronous/live activities with interaction between teachers and the children (or part of the children) in their class and/or school. In the private school sample, on the other hand, almost all teachers who responded the question (49 of 50 respondents) reported offering this type of activity weekly through platforms such as Zoom, Google Meet, Microsoft Teams, among others. This is an important aspect that adds information to earlier described data about the increased risk of educational inequalities. The effect of live/synchronous remote learning will be estimated in the final model of the project (still ongoing), considering not only its existence, but the amount of weekly exposure time. The 49 teachers of preschool classes who reported online activities held, on average,

6.7 weekly hours of live activity involving interaction with children. However, we observe a great variance in the number of hours offered (6.1 standard-deviations) for this type of activity:

TABLE 2 - Distribution of the frequency of responses of teachers in the private school sample regarding the number of weekly hours of live activity with children

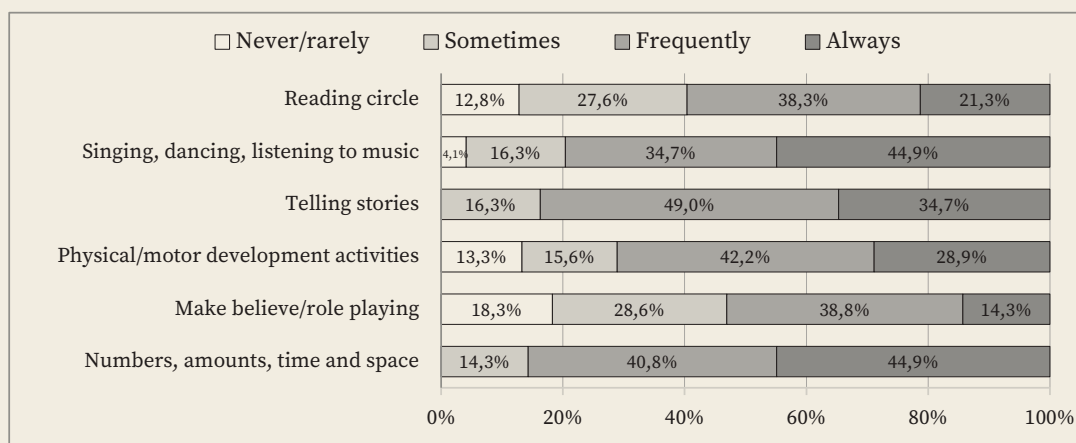
	TEACHERS	PERCENTAGE
No activity	1	2%
1 to 2 hours	12	24%
3 to 5 hours	16	32%
6 to 10 hours	13	26%
Over 10 hours	8	16%
Total	50	100%

Source: Data from the study.

About 56% of teachers (28 respondents) mentioned holding up to five weekly hours of live activities with the children in their classes. Approximately a quarter of teachers (26%) indicated they offered 6-10 hours, and a small proportion (16%) reported providing over 10 hours of online activities and, in three cases, 20 or more hours. The amount of screen time recommended by the World Health Organization (WHO) for this age group is up to one hour a day, which would imply some limits to delivery of live activities in the exceptional time of pandemic. It should be stressed, however, that the WHO recommendations were designed in a period before the pandemic, considering a scenario in which children would be attending school regularly. The argument above should not be interpreted as criticism of synchronous/live remote learning, or even that it might have negative effects on child development.

Once we complete the collection of responses for the questionnaire to parents in the private school sample, we will be able to observe how many hours a week, on average, children attend the activities provided by the school. Thus, it will be possible to more accurately examine the effects of school closure on the interaction between teachers and children, even in contexts where schools employed this type of strategy of remote activities.

Graph 2 shows the type and the frequency of activities carried out online by teachers in the private school sample.

GRAPH 2 – Distribution of the frequency of responses of teachers in the private school sample regarding the presence of activities with live interaction

Source: Data from the study.

About 80% of respondent teachers reported frequently or always doing the following activities: storytelling, singing, dancing, listening to music; and activities focused on numbers, amounts, time and space. A smaller proportion reported doing physical and motor development activities (61%), reading circles (60%) and make believe and role playing activities (53%). Other activities spontaneously mentioned by a small proportion of teachers included online games, doing arts and crafts, paper folding, circles for talking about everyday life, spontaneous writing and cooking.

The closure of schools and the suspension of in-person activities pose great challenges for early childhood education, particularly the virtual mode's limitations to the offer of concrete experiences for children's learning, as indicated in the study by Barnett and Jung (2020). Even though virtual activities allow some interaction between teachers and children, as well as the maintenance of bonds between them, the use of activities involving concrete, hands-on experience seems limited in the repertoire of activities mentioned by the teachers.

Table 3 and Graph 3 reveal challenges related to children's participation and engagement in remote activities proposed by the schools.

TABLE 3 – Distribution of the frequency of responses of teachers in the private school sample regarding children's attendance in live activities

	TEACHERS	PERCENTAGE
Few	11	22.4%
A little less than half	9	18.4%
Half	5	10.2%
A little more than half	7	14.3%
Most of them	17	34.7%
Total	49	100.0%

Source: Data from the study.

Among the teachers who reported doing online activities with the children in their class/school, 34.7% had the attendance of most of them, and 14.3% had a little more than half their class. It is noteworthy that about 41% of teachers said they had the attendance of a little less than half their class or of few children. We do not presently know the reasons of the small attendance. The in-depth interviews with parents and teachers (Stage 3 of data collection) should help us clarify this question. The hypothesis is not a lack of access to internet connection or to devices, but difficulty keeping children engaged and the household organized so as to allow children's attendance. Because we are talking about small children, the presence of an adult by the child is necessary to help them at various points in the proposed activities. This is an important fact which reinforces the huge challenges to the proposition of remote activities, even in a context of private schools

The questionnaire also asked teachers to evaluate, in a 0-10 scale, the engagement of children in live activities (Graph 3).

GRAPH 3 – Distribution of the frequency of responses of teachers in the private school sample regarding children's engagement during live activities in a 0-10 scale



Source: Data from the study.

On average, the perception of teachers regarding children's engagement was positive: 7 points in a 0-10 scale. However, we found variation in the score, and at least 18 of the 49 teachers who offered synchronous/live activities rated children's engagement 6 or lower. Future analysis with the in-depth interviews will seek to understand how parents/teachers perceive the offered activities, as well as the factors described by teachers and parents as hindrances to children's participation and engagement.

Even with the existing limitations to comparisons between the two samples, the analyses indicate that a great proportion of children were deprived of interactions

with teachers. Public schools' strategies during school closure were restricted to designing material and supporting families in doing activities with their children and, therefore, those strategies did not include direct interaction between teachers and children. In other words, they were restricted to offering resources in an effort to support families in creating a richer home learning environment. The success of these strategies depends, on the one hand, on schools' ability to establish constant communication with families and, on the other, on parents' resources and engagement in doing the proposed activities. In the next sections, we will discuss the possibilities and limitations for the strategies deployed in this context. Approximately one-third of teachers in this sample reported they did not keep any contact with the children in their classes during school closure in 2020. Among the teachers who kept contact with the children, 41% mentioned they were able to do so with half the children in their classes or less.

As to private school teachers, most of them used more frequently strategies involving online resources, and they offered live activities with the possibility of interaction between teacher and children. However, even in these cases, we observed numerous challenges to ensuring learning opportunities, particularly when we consider children's participation and engagement. With the increase in the response rate for teachers in the private school sample, it will be possible to compare the differences between the strategies developed by subsidized not for profit and low-fee schools and the strategies of higher-fee schools serving children of higher socioeconomic status. Besides, the conclusion of stage 2 for this sample will also yield more accurate information about the reach of these strategies based on parents' responses about the number of weekly hours of online schooling, as well as their perceptions regarding children's engagement and the effect of these activities on the well-being and/or increased stress for children and families.

Finally, the strategies of public, subsidized not for profit and common private schools, as well as their reach and, consequently, the learning opportunities they offer, are associated with the resources available for implementing remote learning in each context. This question is explored in the next section.

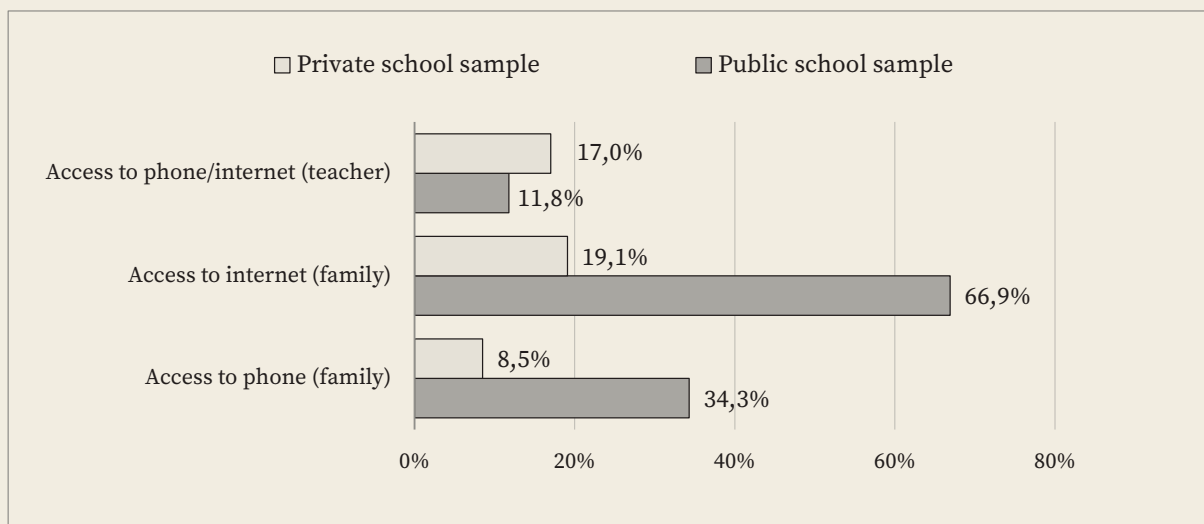
Contact between teachers and families during the school closure period

The main technological resources used by private school teachers to contact the parents of children in their classes are video conferencing platforms (Google Meet, Zoom, Teams, among others), mentioned by 80.8% of respondents. This resource was referred to by only 30% of public school teachers. WhatsApp, on the other hand, was mentioned by 96% of teachers in the public education system for contacting the parents of children in their classes, while in private schools this resource was less frequently mentioned by teachers (64%). Phone calls were referred to by 71%

of public school teachers and 52% of those in private schools. The use of emails to contact parents was less frequent, being mentioned by 29% of private school teachers and by only 3% of those in public schools. Social media like Facebook, on the other hand, for contacting parents was more frequently reported by public school teachers (32%), compared to those in private schools (8%).

The questionnaire allowed observing another contrast: 47% of teachers in the private school sample reported not having difficulty contacting families, while for teachers in the public school sample this value was 13%. Graph 4 brings us a few indications on the main obstacles faced by teachers to keep contact with families (a question that allowed multiple responses).

GRAPH 4 - Percentage of responses of teachers in each school sample according to the main obstacles to keeping contact with families



Source: Data from the study.

For private school teachers, the main hindrance to communication was families' lack of internet access, which was reported by 19% of respondents. A significantly greater proportion of teachers in the public school sample (67%) mentioned this reason as an obstacle to contacting families, in addition to families' lack of access to telephone, reported by 34% of teachers in the public school sample. Finally, 12% of teachers in the public school sample and 17% of those in private schools mentioned their own access to the internet and/or telephone as a hindrance to contacting families.

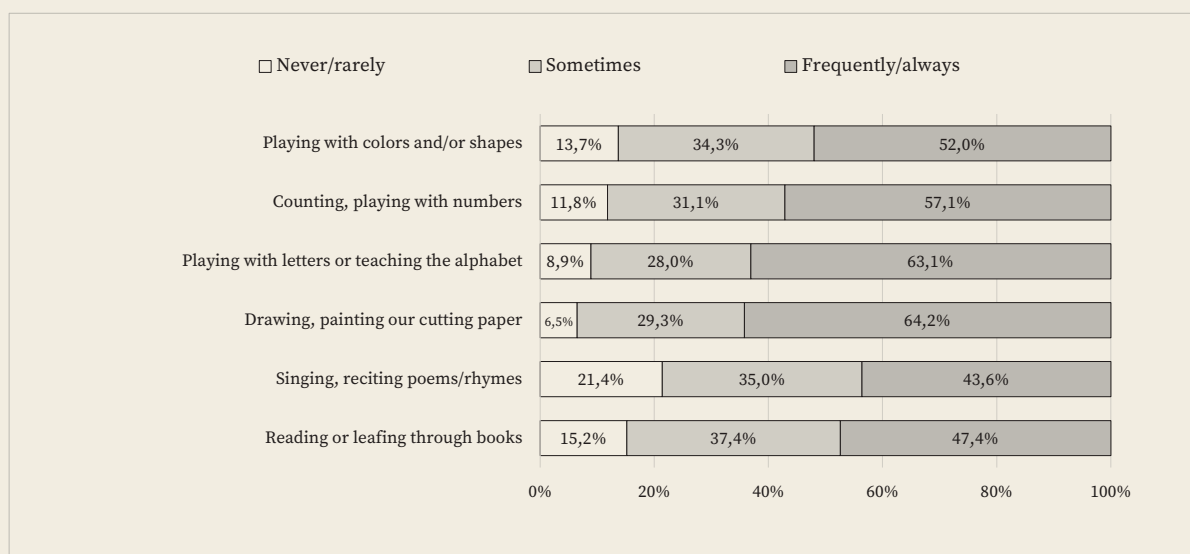
The devices used and the reported barriers to keeping contact with families help us understand the different strategies employed by teachers in the private and public school samples. The public school system we studied is located in a municipality with rural and more remote areas, which impedes contact with families, whether because of their financial insufficiency to pay bills or due to the lack of internet or mobile signal.

Home learning opportunities during the pandemic

As described earlier, studies indicate that the home learning environment (HLE) constitutes a predictive factor of children's development during their preschool stage (SAMMONS *et al.*, 2008; KOSLINSKI *et al.*, in press). In this study, we investigate the home learning environment during the pandemic based on the activities done by families with their children as reported by parents. With the closure for in-person activities, schools would be less capable of providing learning opportunities to children, particularly to the more vulnerable ones and, therefore, we started from the assumption that the opportunities provided by families have gained even more relevance as predictors of child development during the pandemic.

Until now, the study has had a high non-response rate for private schools. For this reason, the analyses presented below about graphs 5 and 6 used only data collected from the questionnaires to parents of children enrolled in public schools.

GRAPH 5 – Distribution of the frequency of responses given by parents of children enrolled in preschool at schools in the public system sample regarding the home learning environment during the pandemic



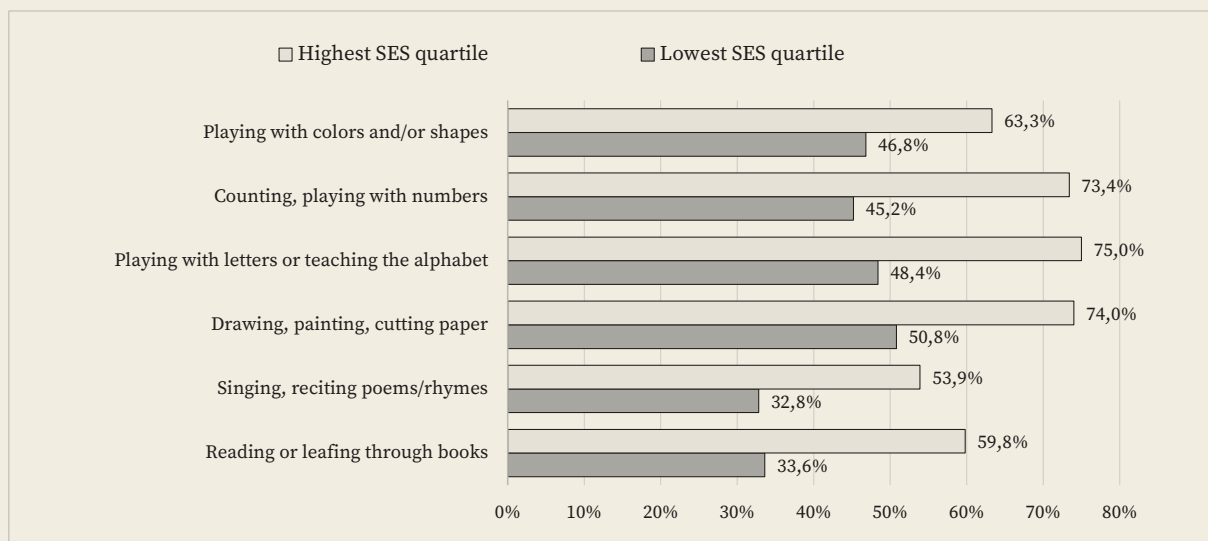
Source: Data from the study.

During the school closure period in 2020, we observed that a great proportion of parents (over 60%) reported they frequently or always did activities such as drawing, painting, cutting paper and playing with letters or teaching the alphabet. We also found that frequently doing activities such as counting, playing with numbers and playing with colors and/or shapes was mentioned by over half of respondents. The frequency for reading or leafing through books, singing and reciting poems and rhymes was smaller, according to parents. Interestingly, the 'never or rarely' category is infrequent for all types of activities, which indicates that a great proportion of families provide environments with diverse learning opportunities for children.

Because the information on home learning environment was collected in the longitudinal study of 2019 for a random sample of parents in the same education system (public), we were able to observe whether changes in pattern occurred before and after the pandemic. In the same vein as the evidence reported by Barnett and Jung (2020) about the U.S. context, we found no significant change in the pattern of interaction between parents and children during the pandemic. This result indicates limitations in the strategies used by schools to support families and enrich their home learning environment, and thus make up for the missed opportunities due to school closure. The only significant change we observed was that parents reported reading or leafing through books with their children more frequently. In 2019, only 34% of parents mentioned doing this frequently or always, a value that reached 47% in 2020, during the pandemic.

Besides, we found a variation in home learning activities according to families' socioeconomic profile. The measure for socioeconomic status (SES) used in Graph 6 was calculated based on items related to goods owned by the family, parents' education attainment and whether the family was covered by the Bolsa Familia cash transfer program, using measures calculated with the Rasch model (BOONE, 2016). The graph below presents the percentage of families who reported doing the listed activities frequently and always, for parents in the highest and lowest SES quartiles.

GRAPH 6 - Percentage of families who always or frequently do activities, according to their socioeconomic status, in the public school sample



Source: Data from the study.

We found that a lower percentage of families of lower SES reported always or frequently doing the six types of activities that compose the home learning environment. The differences between the percentage of parents who do activities more associated with schooling, like playing with letters or teaching the alphabet

and counting and playing with numbers are more pronounced: 48.4% and 45.2% of lower-SES families reported doing these activities, respectively. For higher-SES families, these values are higher: 70.5% and 73.4%. A pronounced contrast was also observed for the percentage of families who reported frequently or always reading or leafing through books with their children: 33.6% of lower-SES parents and 59.8% of higher-SES parents.

The pattern we found reinforces the hypothesis of increased inequalities of learning opportunities in view of the closure of schools for in-person activities.

CONCLUSION

The data presented in the article are part of an impact study about the effects of the COVID-19 pandemic on the well-being and development of children. The study is still ongoing, but the data collected through the questionnaires administered to teachers and parents reveal patterns and reinforce a few hypotheses about the effects of the interruption of in-person activities on the learning opportunities of children and on the increase of educational inequalities.

The results indicate huge challenges to the implementation of remote learning in the public education system, as well as in subsidized not for profit and common private schools. The descriptive analyses indicate that there is a pattern between communication difficulty and families' socioeconomic profile. This can largely be explained by a lack of access to the internet and to different tools that facilitate contact between school and family. Besides, the challenges to engaging children in live activities offered by private schools are also great. Approximately 41% of teachers said they had a little less than half their class or few children during these activities. The evidence reinforces that having access to the internet and to platforms that allow synchronous contact is only part of the challenge to ensuring direct contact between children, teachers and classmates.

The factors associated with children's non-engagement will be investigated in the course of the study and may indicate possibilities and paths for teachers' pedagogical work during school year 2021. Hybrid learning, with in-person and remote classes, will likely be implemented in many schools in Brazil during 2021 and 2022. The description of the most effective strategies can help build pedagogical material to support teachers and families in maximizing learning for children via remote learning.

Finally, the results reveal that learning opportunities are associated with families' socioeconomic profile. The descriptive analysis of data suggests that families of higher socioeconomic status do more frequently different activities and games associated with children's learning. The results we found reinforce

the need for schools and public managers to think about additional strategies to communicate to families the importance of playing games, doing physical activities, reading books and telling stories on a daily basis. In addition, schools can be facilitators that help parents in changing the routine to include games as a form of interaction that is fun and promotes bonding and the development of children.

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