

# Parental Engagement in Early Childhood Education during COVID-19: Learning from structured Tech and Teacher support programs in Urban Maharashtra<sup>1</sup>

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## Abstract

Lower income countries like India struggled to maintain and revive early childhood education (ECE) during COVID-19 induced school closures. Shifts to remote-learning methods necessitated parental engagement in children's education, which proved difficult in resource-constrained environments. Inequalities in parental engagement and access to ECE were only exacerbated during the pandemic, making the need to explore suitable models for greater engagement an urgent priority (UNICEF, 2020).

This paper studies delivery of ECE in two types of ECE centres in cities of Maharashtra, India, both serving disadvantaged households. In response to COVID-19, both initiated a structured "low-tech" programme through Whatsapp that provided age-appropriate content for 3–8-year-olds in form of bite-sized videos. In addition, one type of centre created a structured "teacher support" programme which included a combination of live classes, "well-being" check-ups, and provisioning of educational materials (such as devices and data recharges), as well as non-educational relief support (such as rations and medicines). We surveyed 676 parents and interviewed 58 teachers between April and June 2021 to gauge the influence of both programmes on enabling parent and child engagement in ECE.

We found access to the *low-tech* programme was associated with higher engagement levels (time spent on educational activities). Access to the *teacher support* programme, in addition to the tech programme, was associated with even better outcomes. Teachers corroborated these findings.

*Key Words - Early Childhood Education, Covid-19, Education Technology, Low Income Households, Parental Engagement*

## Introduction

Early Childhood Education (ECE) is recognized for its benefits to development and learning of children across their lifetimes (Silberstein, 2021). However, ECE received limited priority across the globe during COVID-19 (UNESCO, UNICEF, World Bank, 2020). In the Indian context, limited evidence was created on status of ECE delivery during the pandemic. One of the only studies conducted on ECE reported that delivery of ECE was taking place at a "lower scale" and "frequency" compared to pre-pandemic (Accountability Initiative, 2021).

Pre-primary school closures deprive children of cognitive stimulation and socio-emotional development, required to fundamentally prepare them for their future course of learning. Beyond the long-term impact on learning, the closure of early education facilities and limited interactions with extended families and peer groups, further deprived children of both social and cognitive stimulation beyond their homes (Yoshikawa et al., 2020).

In India, prolonged school closures shifted sites of education from schools to homes, with a renewed reliance on Ed-tech. India however found a significant digital divide in access to devices, internet and other resources required to access remote modes of learning (NSSO, 2017-18). For such resource-

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<sup>1</sup> The authors would like to thank Ashifali Vadsaria, Gagandeep Kaur, and Rini D'Souza from The Akanksha Foundation; and Azeez Gupta, Vishal Sunil, Namya Mahajan, Utsav Kheria, and Siddhanth Sachdeva from Rocket Learning for providing access to their projects and communities. We would also like to thank Atul Ade, Deepanshi Tuli, Kranti Jamankar, Khagesh Singanjude, Nilesh Wagde, Rupali Sakpal, Siddharth Desarda, Sonia Saini, Vaishnavi Lakade, and Vrushali Navadkar for conducting data collection. We would also like to thank Lina Cardona-Sosa for detailed comments on the draft. Most importantly, we thank the parents and teachers who provided their valuable time and insights, that made this study possible.

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constrained contexts, use of low-tech modes of communication, such as SMS text messages or WhatsApp messages have been found to be effective in both, imparting remote learning and bridging some of the digital divide in access to the same (Page et al., 2021; McKnight et al., 2016; Aker et al., 2012). Recent evidence from during the COVID-19 pandemic found that an intervention carried out in Botswana in the form of SMS messages followed by a phone call, increased learning levels of children and saw 95% participation from parents (Angrist et al., 2022).

Disruption of ECE and reliance on Ed-tech, necessitated parental engagement in children's education, especially for younger age groups (Borup, et al., 2014; Schroeder & Kelley, 2009). Various barriers prevent parents from engaging in education, especially in resource-constrained contexts, for example access to educational resources (Hornby & Lafaele, 2011), time of parents (Ribeiro et al., 2021), and cognitive bandwidth (Mani, et al., 2013).

This paper studies delivery of ECE in two categories of ECE centres attended by low-income households in urban Maharashtra – 'balwadis' and pre-school grades in 'Akanksha' schools. During COVID-19, both types of centres piloted a structured "low-tech" programme (henceforth, tech programme) called *E-paathshala*<sup>7</sup>. Akanksha schools, were running a structured "teacher support" programme - designed to provide educational and non-educational support to parents – in addition to the tech programme. Our sample includes 676 parents and 58 teachers who were surveyed and interviewed between April and June 2021, to gauge the influence of both programmes on enabling parent and child engagement in ECE.

We found that access to the tech programme was associated with higher engagement levels (time spent on educational activities), while access to the teacher support program, in addition to the tech programme, was associated with even higher engagement. We further found that less educated mothers might require teacher support programmes, over and above tech programmes, to encourage sustained participation (when compared to their more educated counterparts).

Teachers corroborated findings from the data, reporting that parents became "more responsive" and allocated more time towards children's education due to features of the tech program, such as - play-based and interactive nature of content, regularity of receiving content, use of inexpensive materials at home, and ease with which content could be understood.

This paper contributes to nascent evidence on the impact of the COVID-19 pandemic on ECE delivery in low-income settings like India. It further contributes to understanding how low-tech and parental support programmes may enable effective remote education in low-resource contexts, especially in times of crisis but also during routine school closures cause by extreme weather events and natural disasters.

### ***Understanding Parental Engagement in Education:***

Even prior to the pandemic, parental engagement in children's education has been found to greatly improve learning capabilities (Heckman, 2012) social adjustments and behaviour (Nokali, et al., 2010), self-esteem (Goodall & Vorhaus, 2011), and mental health (Jeynes, 2003; Smith, et al., 2020). Various barriers however, prevent parents and caregivers from engaging in education of their children.

At the household level, socio-economic backgrounds of households continue to be a primary determinant of parental engagement in education. Low-income and less educated households (compared to their better-off counterparts) are less likely to provide support (Ribeiro et al., 2021; Brossard et al., 2020), and to be able to access educational resources for ECE in the home (Hornby & Lafaele, 2011). Finally, engagement might also be determined by perceptions of the importance of parental support for learning, whether their child requires it (Ribeiro et al., 2021), and on knowledge about methods to effectively engage (Dighe & Seiden, 2020).

In context of remote modes of learning used during the pandemic, accessibility of internet and devices; low self-efficacy in use of technology (Ribeiro et al., 2021; Povey, et al., 2016); and perceptions about effectiveness of remote modes (Abuhammad, 2020; Dong et al., 2020) might have posed challenges for parental engagement.

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<sup>7</sup> This programme, run by Rocket Learning (a non-profit Ed-tech organisation in India), is currently being conducted in partnership with Ministries of Education and Women and Child Development across five states in India, with a reach of over 1 million children.

Further parents of young children reported increased stress levels and suffering mental health since the start of the pandemic (as highlighted by McCoy, et al., 2021; Brown, et al., 2020).

Engaging parents requires alleviation of this variety of barriers, particularly for already disadvantaged and under-resourced households (Liu, et al., 2010). Additionally, efforts of schools might also determine engagement (González & Gillanders, 2021; Eccles & Harold, 1996).

**THE INTERVENTION:** We study delivery of ECE in two categories of ECE centres - balwadis and pre-school grades Akanksha schools in Mumbai and Pune, Maharashtra.

**Structured Tech Program:** In response to school closures, both types of ECE centres piloted a structured low-tech program called *E-Paathshala*<sup>8</sup> between January and June 2021 - a digital intervention that provides structured and age-appropriate content for 3–8-year-olds, following a well-defined curriculum. The program is designed to enable parents and children in low-income and under-resourced settings to engage in ECE at home.

Parents and class teachers are added to WhatsApp groups on which digital educational content - in form of bite-sized videos (of 2-3 minutes and of <5mb to minimize data usage) are circulated daily. Videos are targeted to parents, and show case educational activities using easily available or easy to procure materials.

**Structure Teacher Support Program:** Through interviews with teachers, we find that the studied ECE centres - balwadis<sup>9</sup> and Akanksha schools<sup>10</sup> - had devised teacher support programs consisting of both, educational and non-educational support, to enable parental engagement in ECE during the pandemic.

In balwadis, teachers reported primarily using WhatsApp for regular teaching, communication and instruction for parents and students. Parents of balwadi students having access to internet-enabled devices were added to WhatsApp groups along with teachers for better communication. The approach taken in balwadis however was largely dependent on initiative of individual teachers and NGOs and varied vastly from one to the other. It was thus mostly developed in an ad-hoc way, in response to school closures.

This made the approach of balwadis relatively “unstructured” compared to the “structured” teacher support programs in Akanksha schools, where parental engagement programs and community outreach had existed prior to the pandemic, and were only adapted to digital modes during school closures. In Akanksha schools, teachers reported using WhatsApp to share educational content with parents, and reported using both synchronous and asynchronous platforms extensively. Live classes of 40 minutes each were conducted on Zoom at least two days a week, and up to five days a week in some cases. Akanksha teachers further help routine phone calls with parents to discuss content shared via the tech programme and to clear doubts. Further, they conducted routine one-on-one “well-being checks” via phone calls with parents, and utilized an established “community support network” to provide parents with non-education support such as rations and medicines, and educational resources including devices and data packs, as required.

At the time of data collection, while all Akanksha schools (17 across Mumbai and Pune) had enrolled their students into the tech program, only some balwadis (279 Marathi-medium balwadis in Mumbai) had enrolled their students in the same. As a result, households sampled could be divided into three groups based on enrollment into the two types of ECE centres, and the tech program. Group I consisted of households enrolled in balwadis and not enrolled in the tech program, Group II consisted of households enrolled in balwadis and the tech program, and Group III consisted of households enrolled in Akanksha schools, all of whom were enrolled in the tech program.

## STUDY DESIGN

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<sup>8</sup> E-paathshala is a programme designed by [Rocket Learning](#)— an India-based non-profit Ed-Tech organisation. The program is currently being used across 10,000 pre-schools catering to over 100,000 students across five states in India.

<sup>9</sup> Balwadis are ECE centres run in schools of the Municipal Corporation of Greater Mumbai (MCGM), with the purpose of catering to low-income communities where ECE delivery is lacking. 819 balwadis are run by 25 different NGOs under a private public partnership model with the Education Department of MCGM, as of July 2021.

<sup>10</sup> [Akanksha Foundation](#) is a NGO running “innovative schools” for children from low-income communities of urban Maharashtra for over 30 years. Currently it runs 21 English-medium schools - 17 having pre-school grades with an enrolment of 815 students under a PPP model with the state.

## Data

We surveyed 676 households enrolled in Akanksha schools and balwadis in Mumbai and Pune, and conducted qualitative interviews with 58 Akanksha and balwadi teachers. Data was collected between 17th April and 18th June 2021. This time-period coincided with the peak of the second wave of COVID-19 in Maharashtra, and almost completely overlapped with the second lockdown in the state<sup>11</sup>. As a result, all surveys were administered telephonically.

Surveys were translated to, and conducted in two languages - Hindi or Marathi - based on preference of respondents. Interviews with teachers were conducted in three languages - Hindi, Marathi or English. Surveys and interview schedules were translated into Hindi and Marathi by certified translators, and back-translated by a third-party.

Surveys of households captured socio-economic characteristics prior to and since the pandemic as well as levels of engagement with ECE of parents and the sampled child, which acted as the variable of interest. Sampled teachers were asked questions about their experiences shifting to digital modes of instruction for teaching, using the structured tech program, and about institutional or individual approaches they have adopted to motivate parents to engage in ECE in the home.

## Sampling Strategy

Sampling of Households: Households were selected from a list of students enrolled in the two distinct ECE centres. Sampling strategies for both types of schools differed based on the information publicly available and/ or provided to the research team.

From Akanksha schools, **data was collected for a total of 311 households**, sampled from a list of all 815 students who were enrolled in pre-school grades for the academic year 2020. Of 292 students enrolled in schools we Mumbai data was collected for 139, and for 523 students enrolled in 9 schools in Pune, data was collected 172. From balwadis, we attempted to contact approximately 1800 households of which **data was collected for 365 households** including a combination of households enrolled in balwadis that were and were not piloting the tech programme at the time of survey<sup>12</sup>.

Attrition rates from those initially sampled to those from whom data was ultimately collected was considerably high, likely due to the period of data collection overlapping with the second wave of the pandemic in the state of Maharashtra<sup>13</sup>.

Sampling of Teachers: **Qualitative interviews were conducted with 58 teachers - 15 employed in Akanksha schools<sup>14</sup> and 43 employed in balwadis.** In balwadis, we collected data from 31 balwadi teachers employed in balwadis piloting the tech programme, and 12 teachers employed in balwadis not involved in piloting<sup>15</sup>.

## Empirical Strategy

The objective of the study was to assess whether receiving the structured tech and teacher support programs was associated with higher engagement of households in ECE. The outcome variables captured - frequency of content shared; frequency of parent and child engagement with content; time spent on education in the week prior to data collection; increase in time spent since the start of the tech

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<sup>11</sup> The second lock-down in the state of Maharashtra spanned from 3rd April to 3rd June 2021.

<sup>12</sup> A complete list of students enrolled in balwadis was not available to the research team. As a result, we relied on a list of phone numbers compiled for enrollment of students into the structured tech program. This list consisted of 2167 unique phone numbers who had been added to a Whatsapp group for the tech program, and had replied on the group at least once. This weeded out incorrect phone numbers.

<sup>13</sup> Households in distress were much less likely to participate in surveys. Surveyors hired for data collection were also impacted by the pandemic directly or indirectly, resulting in some dropping-out temporarily or permanently in between the period of data collection. For this reason, the period of data collection itself was extended from 45 days to approximately 90 days, and required the research team to conduct repeated training with surveyors. Secondly, while response rates of households was low across the three groups, it was considerably lower for households enrolled in balwadis. A possible reason for this could be that Akanksha teachers were regularly interacting with households and informed parents about the research study before-hand. The same could not be done in the case of balwadis. Another explanation could be because the MCGM did not have an updated and complete list of enrolled students', sampling from balwadis was done with reference to the enrolment of balwadi households into the pilot tech program, which might itself have various errors of exclusion. For example, the list of numbers compiled for this purpose would only include parents having internet-enabled smartphones that are compatible with Whatsapp.

<sup>14</sup> In Akanksha schools we were provided with a complete list of the 34 Junior KG teachers, - two per Junior KG class. We attempted to speak to one of the two class teachers per school, selected randomly, of which interviews were conducted with 14 Junior K.G. teachers.

<sup>15</sup> We first selected a random sample of 50 balwadi teachers employed in the 279 Marathi-medium balwadis, of which interviews were conducted with 31 teachers. We then randomly sampled 30 teachers from 171 Hindi-medium balwadis (where the tech program was not being piloted), of which interviews were conducted with 12 teachers.

programme; and households' willingness to continue participating in the program (even once schools reopen and if content was no longer shared with them).

The explanatory variable is one that captures whether households belonged to Group I (enrolled in balwadis and not participating in the structured tech program), Group II (enrolled in balwadis and participating in the structured tech program), or Group III (enrolled in Akanksha schools that have a structured teacher support program, and participating in the structured tech program).

Since the selection into the programme and our sample may not have been random, we account for differences in socio-economic background characteristics of households through a conditional linear regression analysis. Control variables include - gender and age of the sampled child; household size; highest education level attained by the mother of the child; monthly household income; occupation of the household head; religion and caste group of households; whether any child in the household (apart from sampled child) had attended a preschool; and ownership of a computer, smartphone with internet, or TV. Additionally, we control for whether data was collected during the COVID-19 lockdown in the state, and during the one-month summer holiday for Akanksha schools (where frequency of digital ECE content was reduced and live classes were not being held<sup>16</sup>). Standard errors are clustered at the school or balwadi level.

While we find differences in outcomes across the three groups - reflecting an association of the tech and teacher support programmes with higher engagement - it is difficult to attribute differences solely to the programs due to possible endogeneity bias. We thus utilize data collected through open-ended questions with parents about the programme, as well as in-depth interviews with teachers, to corroborate findings from the conditional analyses.

## RESULTS

**Background of households:** We found that social and economic disadvantage (across indicators of household income, occupation of household heads, social group, maternal education, and access to devices) follows a gradient in our sample. Group III households (those in Akanksha schools) are socially and economically most well-off, relative to households attending balwadis. Further, Group II households are better-off than Group I households. Socio-economic differences across Groups are presented in Table 1.

### [Table 1 here]

The entire sample however, on average, was more disadvantaged than the average urban resident in Maharashtra, with lower parental education levels and a higher population of Muslim households compared to population averages for the state (NFHS-5, 2019). On the other hand, it should be noted that given the sample is selected from two of the largest cities in the state, sampled households are likely to more advantaged than the majority of the country, even in access to programmes such as those under study.

**Parent and Child Engagement in ECE:** We compared households in Groups I, II, and III on all outcomes through a multivariate linear regression model<sup>17</sup>, controlling for key demographic and socio-economic indicators that we found to differ across the three groups (as presented in the section above).

### [Table 2 here]

Group II and Group III households – who were participating in the structured tech program – were more likely (compared to Group I households) to report; receiving content on more days (in the “last week”); higher parent and child engagement levels; having increased time engaging in educational activities (since the start of the tech programme); and willingness to continue the program. These differences persist even after accounting for socioeconomic and demographic indicators.

Group III households – who received both structured tech and structured teacher support – were significantly more likely to have spent more days on ECE (in the “last week”) and to report engaging in

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<sup>16</sup> During the period of data collection, both balwadis and Akanksha schools had annual summer holidays (between 1st and 31st May 2021). For this reason, only in Akanksha schools, the frequency of E-Paatshala content was reduced from daily to 5 times a week.

<sup>17</sup> For the purpose of maintaining brevity in the text, we highlight only those indicators where differences are statistically significant at the 5% level (i.e.  $p < 0.05$ ). See Table 2 for regression coefficients. Complete tables can be provided on request.

“most or all” of the educational activities shared with them, even when compared to Group II households (who participated in the tech programme, but had “unstructured teacher support”).

Average hours spent on ECE engagement (in the “last week”) however, did not significantly vary across groups.

To further understand the efficacy of the programmes, we interact the intervention type with an important driver of parental and tech engagement - mother’s education levels (Ribeiro et al., 2021; Brossard et al., 2020). We find that more educated mothers (those who completed 10<sup>th</sup> grade or above) have a higher likelihood of wanting to continue the programme (“once it stopped” or “once schools reopened”) – this is true for mothers in both intervention Groups (II and III).

### **Did the programme “work” and what components drove engagement?**

Although we are unable to address selection issues and endogeneity concerns in the model, we corroborate these findings by drawing from in-depth interviews with teachers. Insights from teacher and parent interviews highlighted multiple possible factors at play - mode of delivery, type of content, resources and capacity required to do the activities.

Teachers working in ECE centres implementing these programmes observed an increase in parental engagement and suggested the tech programme nudged parents to become “more responsive” - evidenced by a higher responsiveness from parents in reaching out to teachers for feedback and clarifications, and inquiring about future content. Teachers suggested that the use of a familiar platform like WhatsApp likely minimized parent’s hesitancy with technology. Further, content sent to parents was in the form of short videos that were easy to download and did not require substantial internet bandwidth. They also suggested it helped parents learn how to conduct activities, which may also explain their willingness to continue engaging in the programme even after schools reopen.

Several teachers emphasised that high quality of content drove parental engagement, describing it as “interactive”, “play-based” and “simple to understand”. They also praised the curriculum of the tech programme for being holistic (“going beyond only basic literacy and numeracy”). Similarly almost 60% of parents participating in the programme engaged with the content because they found it “interesting”, and 80% said their children liked the content.

Teachers also praised content for only featuring materials and resources that are already available at home (minimising need for parents to spend money), while almost 90% of households participating in the tech programme reported that materials for activities were available at home.

Finally, teachers said the tech programme eased their workload by providing curated digital content, and some explained that it helped them build their own capacity to teach remotely, and informed them with new ideas and methods for teaching.

### **Discussion and Conclusion**

Findings of this study highlight the potential of contextually appropriate low-tech educational content and teacher support, in improving parent and consequently child engagement in ECE. Analysis of data from households and teachers revealed that for parents who had access to devices, the tech programme might have helped alleviate several barriers like low motivation levels, poor knowledge regarding learning and teaching methods, and low self-efficacy in use of technology, which usually hinder parental engagement during the early childhood period.

The observed premium in engagement levels for those receiving structured teacher support also revealed the criticality of non-educational support in the form of counselling, relief provisions (such as food) and educational resources, in times of crises.

Alleviating barriers of parental engagement have the potential to not just improve learning abilities and school readiness of the child, but also development of children more holistically. This is only possible if efforts are made to understand the resources and context of parents and children in their homes.

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## Tables

**Table 1: Sample Description – Households and Children in the Sample**

Households Characteristics	Group I	Group II	Group III	Total
<b>Monthly HH Income prior to Covid-19 in INR (Median)</b>	11000	12000	15000	12000
<b>Asset Ownership (%)</b>	<b>Group I</b>	<b>Group II</b>	<b>Group III</b>	<b>Total</b>
TV with Cable	50.35	65.63	76.21	67.31
Computer/Laptop/Tablet	21.99	54.02	40.19	40.98
Fridge	44.68	72.32	74.6	67.6
<b>Mother's Education (%)</b>				
No formal Schooling	13.48	16.07	4.50	10.21
10th and above	34.76	41.52	59.17	48.23
<b>Father's Education (%)</b>				
No formal Schooling	8.51	10.27	2.89	6.51
10th and above	53.20	54.91	58.85	56.36
<b>Social Group (%)</b>				
Gen (Hindu)	7.09	11.61	20.58	14.79
SCST (Hindu)	7.8	5.36	9.32	7.69
OBC (Hindu)	39.72	30.36	26.69	30.62
Muslim	23.4	36.16	33.44	32.25
Others	21.99	16.52	9.97	14.64
<b>Child Characteristics</b>				
Female (%)	53.9	55.36	49.2	52.22
Disability (%)	1.42	0.45	0.96	0.89
<b>N</b>	<b>141</b>	<b>224</b>	<b>311</b>	<b>676</b>

**Table 2: Parent & Child Engagement, and continuance of programme**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Days received content in the last week	Days engaged in activity in last week	Engaged zero hours last week	Engaged in "all/most" activities in last week	Engaged in "none" of activities in last week	Hours spent on ECE in last week	Time spent on ECE increased in last 6 months	Continue engaging when schools reopen	Continue engaging when content stops
<b>Reference: Group I (attending balwadis, not participating in E-paathshala)</b>									
<b>Group II</b> (balwadis and E-paathshala program)	<b>0.93***</b>	<b>0.39</b>	<b>0.03</b>	<b>0.02</b>	<b>-0.05</b>	<b>-0.02</b>	<b>0.20***</b>	<b>0.12***</b>	<b>0.14**</b>
	(0.3)	(0.3)	(0.1)	(0.1)	(0.1)	(0.4)	(0.1)	(0.1)	(0.1)
<b>Group III</b> (Akanksha schools and E-paathshala program)	<b>0.35</b>	<b>0.49**</b>	<b>0.10**</b>	<b>0.24***</b>	<b>-0.12**</b>	<b>-0.40</b>	<b>0.23***</b>	<b>0.37***</b>	<b>0.33***</b>
	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.4)	(0.1)	(0.1)	(0.1)
<b>Child's Age and Sex</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Household Size</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Mother's Education</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Log Monthly Income</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Occupation of Household Head</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Social Category</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Devices and internet at home</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Older child attended pre-school</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
Lockdown period	YES	YES	YES	YES	YES	YES	YES	YES	YES
Summer Holidays	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Constant</b>	<b>3.10***</b>	<b>1.03</b>	<b>0.42***</b>	<b>-0.28*</b>	<b>0.69***</b>	<b>2.07***</b>	<b>0.17</b>	<b>0.15</b>	<b>0.17</b>
	(0.7)	(0.8)	(0.2)	(0.2)	(0.2)	(0.8)	(0.2)	(0.2)	(0.2)
<b>R<sup>2</sup></b>	<b>0.15</b>	<b>0.06</b>	<b>0.04</b>	<b>0.1</b>	<b>0.07</b>	<b>0.07</b>	<b>0.12</b>	<b>0.17</b>	<b>0.16</b>
<b>N</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>

Note: Standard errors in parentheses (\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ ). Equivalence of Groups II and III are also tested and reported, where significant.