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Does school matter for children's cognitive and non-cognitive learning? Findings from a natural experiment in Pakistan and India

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Abstract

This paper reports on the findings of a natural experiment based on a sample of 1123 children aged 4-8 from the provinces of Punjab in Pakistan, and Gujarat in India. It looks at the impact of attendance (or not) in early schooling on the cognitive and social-emotional development of young children. The role of school attendance was assessed over 1 year. Children and their families were assessed twice, in or near their village homes. The study confirmed that all children progressed in learning regardless of school attendance. The overall impact of schooling is clear but relatively small. Children who attended school over the year showed greater gains in numeracy and especially in social and emotional learning, which appear to be harder than literacy to pick up outside school. Parents and children offered a range of reasons for non-attendance, including safety at home for girls, household poverty and a perception that school will not matter for their child's envisaged future. The study therefore raises a variety of issues for central and local governments to address if they want to create a school system suitable for all citizens.

KEYWORDS

early childhood education, school attainment, school attendance, social-emotional development

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Key insights

What is the main issue that the paper addresses?

Children's non-attendance and dropping out before completing primary school remain challenging barriers to achieving universal education goals. This paper examines the impact of school attendance on both cognitive and non-cognitive learning outcomes in children. The findings highlight the role of schooling in early years of life, emphasising on the factors that can influence children's engagement (or disengagement) with school.

What are the main insights that the paper provides?

The study findings confirmed that all children progressed in learning regardless of school attendance. Children who attended school over the year showed greater gains in social and emotional learning and numeracy outcomes, which appear to be harder than literacy to pick up outside school. The overall impact of schooling is clear but relatively small.

INTRODUCTION

This paper contributes to the literature on the role of school attendance in the cognitive and social development of young children. The study sample included children and families living in villages in India and Pakistan where school attendance, and even the existence of local schools, is far from universal. In this setting, of a less developed school system, there is a natural possibility to assess the progress of young children in school compared with those who do not attend.

The existing evidence on school attendance effects on children's learning remains somewhat unclear because of methodological limitations in creating clear comparisons of children exposed to school with their counterparts never exposed to school (Blau, 2021). Moreover, for ethical reasons, schooling as a long-term intervention cannot be provided for selected children only. However, a natural experiment as used here based on naturally occurring comparisons is possible and ethical. Most existing school effectiveness research concerns differential attainment between schools in one system, rather the effectiveness of attending schools or not in a national system more generally (Rutter & Maughan, 2002).

The paper starts with a brief consideration of existing literature on school enrolment and attendance, and the importance of this in developing education systems. It then outlines the methods used in the new study, before describing the results of the natural experiment, and the accompanying in-depth interview and observational data. The paper concludes with a discussion of limitations and possible implications.

This study looked at the role of school, by comparing existing samples in naturally occurring settings. Some children were attending school, others were not, and yet others were enrolled in early school but then dropped out. The main research questions are:

- · What is the impact of early school enrolment on children's learning?
- · Why do some children attend schools while others do not?

The role of schools for young children

School is usually introduced in children's lives when they begin to develop some independence from parents/carers, and can adapt to an environment mainly intended to accelerate their learning in the early years. In the last decade, increased access to early childhood learning has been a worldwide policy focus, leading to more provision and programmes in developing school systems (Richter et al., 2019). Education systems have adopted different policies for their school starting age but the expected range of starting formal school is usually between 5 and 7 years of age (Sharp, 2002). Prior evidence is inconclusive on the most appropriate age for starting school and whether an early start leads to better academic attainment outcomes in later stages of education (Burger, 2010; Hoskovcová & Sikorska Iwona, 2014). However, there is some evidence suggesting beneficial effects for disadvantaged children if they start school earlier (Berlinski et al., 2008; Downey et al., 2004; Heckman, 2006). The philosophy and practice of early childhood education promote preschool programmes and school readiness interventions targeting children's preparedness in health, self-regulation, social and emotional development, language development, cognitive development and attitudes to learning.

Schools have many purposes, for the state, the individual student and other stakeholders. The development of schooling policies is partly driven by a general realisation of children's rights to live a safe life, free from fear of hunger and poverty. They hinder children's participation in economic labour and the workforce, which is seen as exploitation and abuse (Berlinski & Galiani, 2008; Niño-Zarazúa, 2019). They may help prevent early marriage and teenage pregnancy (Birchall, 2018). The emergence of compulsory school attendance has made it easier to free parents to go to work in industrial and post-industrial settings (Morrissey, 2017), and has especially increased women's labour force participation (Dahl & Lochner, 2012; Tsai et al., 2009), making the role of school even more essential in socially and economically expanding societies.

Other potential benefits of universal school provision include increasing fairness, justice and opportunities for all, especially for the children facing socioeconomic poverty at the household level (Raudenbush & Eschmann, 2015; Tymms et al., 2023). Schools may also play an important role in promoting social and economic equality, especially following periods of conflict, natural disasters and economic downturns (Hermanussen et al., 2018). Whether schools achieve such a range of benefits is a matter of debate (Downey & Condron, 2016; Gorard et al., 2022), and is partly the subject of this paper.

Research has shown that poverty and adversity in early childhood can have negative impacts on brain development and cognitive processes, which can affect individuals throughout their lives (Shonkoff & Garner, 2012). However, early interventions between the ages of 3 and 8 that include access to healthy nutrition and educational programmes can help mitigate these negative effects and promote positive development (Li et al., 2003; McCoy et al., 2018; Nores & Barnett, 2010; OECD, 2018). It is therefore important to prioritise early interventions for children from disadvantaged backgrounds to ensure they have the best possible outcomes.

Schools can provide a structured and stimulating environment for children to learn and grow (Black et al., 2017; Marcovitch et al., 2015; Noble et al., 2015; Weaver, 2014), and they can also act as a buffer against the negative effects of poverty, neglect and other adversities that children may face at home (Taggart, 2010; Volpi, 2002). Schools can play an important role in providing a safe and structured environment for children's learning and development (Chopra, 2016; Mamat et al., 2023). Children who are out of school face significant risks, including abuse, poor health, violence and exploitation in the labour force (UNICEF, 2018). Schools are also linked to wider outcomes such as resilience, critical thinking, social skills

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and civic awareness (Siddiqui et al., 2019), even though these tend to receive less attention in the policy agenda.

Of course, low-quality and poorly monitored universal education provision could also have negative impacts on children's social–emotional wellbeing, and life satisfaction. International comparisons of learning outcomes suggest that simply attending school is not enough to ensure that children are achieving minimum levels of learning (UNESCO, 2017). This is a persistent problem of low-quality schooling in many countries, including some with well-established and well-resourced school systems (Thomson, 2019). There are issues of the safety and appropriateness of school buildings, teacher supply and qualification, as well as issues of curriculum and pedagogy (Gorard et al., 2022). What is needed is universal provision of quality schooling. Some governments, like that of Pakistan, have failed to achieve the Sustainable Development Goal to ensure inclusive and equitable quality education and promote basic learning opportunities for all.

Schools are not the only places where such protection, learning and development can take place. These things can and often are provided by families. In countries where attendance at school is not enforced by state laws, many children do not attend school and can still learn to survive and thrive in their given social environment (Amury & Komba, 2010; Ennew, 2003). The issue is that some families do not have the time or resources that others do. Compulsory schooling is at least partly about providing learning resources for all, including the poorest children from struggling families.

Why invest in early childhood education?

Children are vulnerable and receptive in their early years because their brains are highly malleable and receptive to new information, making it a critical period for learning and development (Marzola et al., 2023). These are developmental years in which children need to be shielded from harm but given opportunities for social and cognitive development. Investment of resources in early childhood education is therefore a priority (Campbell-Barr, 2012; Siddiqui et al., 2022). Establishing a school system inclusive of early childhood education is a considerable cost for the public purse, even if funded by the state government (Levin & Schwartz, 2012). To put into context, the Department for Education in England spends on average £7000+ per child annually which gives 15h of universal access to early years settings and a free meal (Department for Education (DfE), 2020). In Punjab, the Pakistan government on average spends PKR18,000 (equivalent to £53) per child annually on pre- and primary education and without a free meal for children in school. In Gujarat, India the government spends INR 39,000 rupees (equivalent to £397) per child annually, which includes provision of a free meal in Anganwadi Centres. These are marked differences in resource, and therefore in the likely quality of provisions.

Despite the financial cost associated with early childhood education, there is worldwide recognition that exposure to early childhood education in the form of school or formalised education provision can prevent later costs for the public welfare system. There are shortand medium-term benefits gained by children from disadvantaged backgrounds (Krueger & Card, 1994; Lynch & Vaghul, 2015), such as improved attainment, retention in education, completion of compulsory school and transition to non-compulsory education, which in return can also reduce state expenditure on health and medical cost, use of welfare benefits and the costs of crime and the legal system (Hillman & Williams, 2015). There is substantial evidence that financial constraints faced by some parents have prevented their children from accessing school (Lochner & Monge-Naranjo, 2012), especially for early childhood educational provision, which is not compulsory or universally available in many countries (Tran et al., 2017). Research provides some evidence on the role of school in children's early years of development. Existing studies have suggested a benefit from school (amount of schooling, regularity, continuance, age on entry, early or delayed schooling) on children's cognitive development (Bedard & Dhuey, 2006; Cliffordson & Gustafsson, 2008; Dobkin & Ferreira, 2010; Fredriksson & Ockert, 2005; Gottfried, 2010; Grigg, 2012; Sheldon, 2007). However, in countries where school is a universal provision and attendance is compulsory (Reynolds & Teddlie, 2001; Tymms et al., 1997), the impact of school attendance on cognitive outcomes is more nuanced. Regression discontinuity approaches show that much or indeed most of the progress that children make happens with age and experience, and is not specifically related to school attendance or not (Luyten et al., 2006). And evidence following natural changes, such as a move to the 4 day week in school, tends to support this (Morton et al., 2022). A high rate of school enrolment does not necessarily lead to substantially large gains in academic outcomes (Melhuish & Gardiner, 2020).

In this new study, we use the fact that schooling in India and especially Pakistan is far from universal, even for young children, to look at the literacy, numeracy and other developmental progress made by a group of over 1000 young children, only some of whom were enrolled in schools. According to development indicators from the World Bank Group (2020), Gujarat in India and Punjab in Pakistan share similar poverty levels, both exceeding their national averages (Iqbal, 2020). Politically, both regions are significant, as the elected governments in each country have leadership originating from these areas. The study described in this paper is not a country-level comparison, and the sample is treated as a single group given the uniform age criteria for children within these national school systems, where school attendance rates for young children remain low.

METHODS USED IN THIS STUDY

This research examined the impact and experience of schooling by analysing various groups in natural settings—children attending school, those not attending, and those who initially enrolled but later dropped out. The main analysis focused on the reasons for school attendance as reported by families, and the effects of early enrolment on children's learning outcomes.

The study design is longitudinal, involving assessments of a selected child sample in two waves with a gap of 12 months. During the gap between two assessments the number of children were recorded as enrolled, not enrolled, dropped out and always enrolled. The information is accounted for in the analyses.

The paper is presenting in-depth and narrative data as explanation of results obtained from the findings of longitudinal assessment outcomes and regression models. The rigour and originality of the study is its research design (a natural experiment), sample scale (large sample including assessments of children who have never attended schools and dropouts) and narrative details from children and parents on experiences and perception of attending school (or not).

The sample

The sampling took place in 12 districts of the Punjab province in Pakistan, and six districts from the state of Gujarat in India (Table 1). This was handled by the NGOs Idara-e-Taleem (ITA Pakistan) and Mycor (India) who asked community members to find volunteer house-holds with appropriate age children. This study involved 90 trained and highly experienced enumerators recruited from the local communities, who had access to households

TARIE 1

Rural

and could follow up the participants after 12 months for a second data sweep. Usually, 10 volunteer households participated in each of two villages, in each district. All households included some children aged 4–6, according to parental reports. The initial sample was 783 households with 1129 eligible children, whose data was collected in June 2020. In each country, the recruitment areas were reasonably balanced between households in rural and urban areas. Figure 1 shows the figures for each country at each phase of the study.

The sample had a reasonable balance of children attending school or not, and girls and boys from both countries (Table 2). In the second data sweep in June 2021, we could not track 106 children where the enumerators lost contact with 53 households, meaning that our achieved sample across both phases was 1023. This attrition constitutes 9% of the initially recruited sample. Table 2 also presents some of the characteristics of the missing cases to help understand the extent to which the attrition might lead to any bias in the results (Gorard, 2021). The missing cases are more likely to be urban, younger and from significantly poorer families.

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Households	Punjab (Pakistan)	Gujarat (India)				
Urban	158	237				

Geography of the sample (N)

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Achieved sample	rget Sample (<i>N</i>)
Household = 783	lousehold (750)
Children = 1129	hildren (1500)
Pakistan: Data sweep 2020 (<i>N</i>)	India: Data sweep 2020 (<i>N</i>)
Children = 616	Children = 513
Girls = 309	Girls = 264
Enrolled in school = 436	Enrolled in school = 118
Not enrolled in school = 180	Not enroled in school = 395
Pakistan: Data sweep 2021 (<i>N</i>)	India: Data sweep 2021(<i>N</i>)
Children = 543	Children = 480
Lost in follow up = 73	Lost in follow up = 33
Girls = 276	Girls = 234
Enrolled in school = 487	Enrolled in school = 385
Not enrolled in school = 56	Not enrolled in school = 95

FIGURE 1 Flow chart showing the number of cases, by country and phase.

TABLE 2 Missing children's characteristics compared with the achieved sample.

	Dropped out	Achieved sample
Girls	48%	49%
Child has disability	8%	4%
Children involved in housework	19%	20%
Average age in months, 2020	59	75
Average household assets (maximum 14)	7	9
Average household income Punjab, Pakistan	Rs 29,000	Rs 42,317
Average household income Gujarat, India	₹ 41,500	₹ 69,041

Instruments

The children were assessed for literacy, numeracy and social-emotional learning at the outset and again a year later. The assessment instrument was the International Development and Early Learning Assessment (IDELA) test, developed by the Save the Children organisation. The IDELA test has been adopted in at least 32 countries, including India and Pakistan (Save the Children, Countries of Implementation available at Countries of Implementation | IDELA, idela-network.org) for assessing children's learning and development. Several studies have already been published in which this instrument has been used. The nature and research design of the studies vary, but IDELA has been shown to be an effective measure for use with young children, and clearly demonstrated children's early years of development and learning profiles (Halpin et al., 2019; Pisani et al., 2018).

The IDELA test is a standardised test administered by a trained assessor to an individual child. We used it to assess three domains of learning in literacy, numeracy, social emotional development in early years. Literacy was assessed in terms of expressive vocabulary, letter identification, first letter sound identification and listening comprehension. For numeracy, children were asked to compare size and length, and to identify shapes, numbers and simple operations, such as, addition and subtraction. Social emotional development was assessed in three sub-domains of self-awareness, social bonding and recognition of emotions. We also looked at the general behaviour of the child (not covered in this paper). Fuller details of the testing appear in Siddiqui et al. (2022, 2023).

We piloted IDELA face-to-face in each household, or outside the house in the open, and sometimes through proximal mobile phone video calls (using screens to avoid very close contact owing to Covid). We selected the most appropriate features of the assessment that could be implemented using mobile phone and internet technologies where close contact was not permitted, and deleted items that involved handling objects or physical activity.

We also interviewed 30 parents regarding household socioeconomic conditions, reasons for school enrolment choices, children's general health and interest in attending school. Interviews were intended to provide insights and perspectives directly from parents to deepen our understanding of the reasons for school enrolment and dropout patterns. Seventy children were also involved in these discussions as far as possible.

Analyses

The interview and other in-depth data was classified in terms of largely pre-existing themes, such as why a child did or did not attend school, the barriers to school attendance and school experiences. However, some stories were not foreseen and were the more valuable for that.

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We produced descriptive results for the major impact variables and mean differences in outcomes between groups, such as those attending and not attending school. We converted these differences to simple 'effect sizes' based on Cohen's *d* formulae for standardising the differences. Evidence on education programme evaluations and school effectiveness have long used such 'effect size' formulae for reporting impact results (Coe, 2002; Slate & Jones, 2005; Xiao et al., 2016). Mathematical presentation of Cohen's *d* formulae is below:

$$Cohen's d = \frac{M_1 - M_2}{SD_{(P)}}$$

where $Mean_1 = group$ that attended school; $Mean_2 = group$ that did not attend school; and $SD_{(P)} = sum$ of standard deviation for both groups.

We created multiple linear regression models for each outcome, which are used to predict or explain the 2021 result for each child using selected known characteristics such as age, their 2020 results and whether the child was reported as attending school in 2020 and again in 2021. The predictors were entered in a forward fashion in the order of the amount of variation they explained. Any variable that did not improve the prediction was excluded from the model.

We report effect sizes, changes in R^2 and coefficient values as our headline results. The study design involves no randomisation (and there is 9% attrition). Therefore, we do not use significance tests, confidence intervals or similar, as these are mathematically predicated on randomisation (Amrhein et al., 2019; Armstrong, 2008; Baker, 2016; Gorard, 2021).

RESULTS OF THE STUDY

School attendance

Of the achieved sample for both years, 692 children (68%) were in school for both years and 98 (10%) were never recorded as attending school (Table 3). The remainder were recorded as attending school in only one of the years.

There were some substantial differences between the characteristics of children with the four patterns of school attendance or non-attendance (Table 4). Those attending school in 2020 had more household assets (a measure of relative wealth) and those attending in both years were a little older.

School attendance is increasing in both countries and other developing education systems (Gorard et al., 2022). There is investment in new or free school places, either by governments or by international organisations. Also, more women are joining the labour workforce in both countries, which means more children are attending school as a kind of childcare if nothing else.

However, many reasons were suggested by families for children still not being enrolled in school, or for dropping out of school at a young age. In rural areas there were concerns over

	Attended school 2021	Not in school 2021	Total
Attended school 2020	692	53	745
Not in school 2020	180	98	278
Total	972	151	1023

TABLE 3 Children's patterns of school attendance.

TABLE 4	Children's characteristics by pattern of school attendance
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	Attended school both years	Attended school first year only	Attended school second year only	Did not attend school either year
Average age in months, 2020	5.68	4.89	4.99	4.51
Average household assets	8.99	9.31	7.43	7.82
Girls—percentage	50.7%	47.2%	53.3%	50.0%
Disability	1.5%	2.0%	3.6%	1.1%
Children involved in housework	18.8%	11.8%	18.1%	12.0%

the distance from home to school, even if the school was free to attend, and in urban areas as well there were concerns over child safety, especially for girls.

One mother, asked why she does not send her daughter to school, said:

The school is not near, and I worry if she walks to school then it is not safe for her. It is at least safe that she is at home.

Children's education was not always a priority when family income resources were very limited and there was no government provision to support children's enrolment in school. Income constraints and school fees were in tension.

A mother of four children said:

I am dependent on my brother's income. My husband is in jail for a minor crime. And I have a few months-old baby to look after. I can't even work under such condition. I have no other means to support my children. Two of them used to go to school before but now I can't pay the fees, so they don't go to school anymore. These are very hard times.

Other mothers said:

We decided to come to city so that we could earn some money and make a pukka house in our village. If I spend on school fees, I can't save money.

I can't leave my younger child alone at home. She is a toddler. Her elder sister look after her. I can't afford to send them to school unless both go to school. I know my elder daughter is missing school but there is no other way. None in our family have ever gone to school. There is a school but we just don't bother. Children are happy like this.

I have a 12 years old daughter who works now. When my husband lost job in the pandemic we had no means to support our family. He worked in the city and we were in the village where there was no work for him. We were in real difficult times after a few months and then someone asked if we could send our elder daughter to work as house cleaner and helper for a family in the city. We had no choice. I went with my daughter at first to see the family and I was very satisfied to know that they were kind people. She was not going to school anyway so living in that big city house with educated people would give her some skills. She lives in that house and we get her monthly salary in the village. This is our only means of survival. She is happy there because she is looked after well by that family. Her education finished then but at least she is happy and safe there. That's more important for me than her school education.

This idea, that school is not really appropriate or useful for their children, appeared in several interviews:

School is for people who understand its value. No one in our family have gone to school and children just help their parents in farming, construction, fields and housework. Our children grow up learning these skills. We see school education is relevant for jobs in the city. Our children will never do those jobs. We don't get anything from that education from school. Our children learn from doing things with elders and then they take up those tasks themselves.

Some families, especially in rural areas, justified their decision not to use schools because they feel that what children learn in school will be of no relevance to their future occupation. These families seem to assume that their children will follow in their footsteps.

I want my son to become a carpenter and this is how he is going to support himself and our family. School cannot help him learn any such thing. A lot of labour migrants go to Middle-East on skilled jobs. No one asks if they completed school or not. We have progressed financially by working on construction sites. I want my son to join that workforce as it brings good amount of money. They ask what we know in construction of houses and buildings. These skills are learned as we saw our parents doing and this is how our children will learn. School education is for people who will work in offices.

I am a refugee from Afghanistan. My family came to Pakistan and the only thing that helped me to survive in the construction sites was skill as plumber. As a child I worked with my father's friend and slowly I learned this work. This is not what school had taught me. I wasted my time in school whatever years I spent. I want my son to learn skills as early as possible so that he becomes financially independent. School wastes our time. I know that school opens opportunities for children but we are not in that race.

One of the daughters is very good in school and the teachers encouraged us to help her in coming to school every day. She is continuing school and we will do our best that she completes education. The older daughter was not good in getting good results. Teachers were not happy so I thought it is better to take her out from school and she could spend time in learning some other skills. Spending school fee on her was a waste of our limited income resources. She was not happy in school and never liked teachers. She now helps me at home and in the evening she spends a few hours at my friend's place in learning skills for stitching clothes. She can cook now and she could stitch as well.

Children who moved from rural to urban areas, or from very poor or broken families, were also less likely to attend school. In conversation with these children, we found a mature (but distressing) attitude of responsibility towards family and fight for survival. The following quotations from their interviews reflect their experience of a life in which school does not play any role.

One child said:

I work in this hotel. My job is cleaning tables and washing dishes. I get paid every day and I give all that money to my mother. She works and we all have to work for money. My father has left us. The hotel owner is a very strict man. I sometime sleep in this hotel when it gets late at night.

(Jabir, 8 years)

Others told us:

I have to go to shop for work every morning. If I don't go to work, then we will not have enough money to eat food. My dad said we don't need school.

(Adil, age 8 years)

I work in a factory shop 3 days a week. When I don't go to work we play in the street and there is a water pond. I know how to swim.

(Sarmad, 6 years old)

I help my mother at home. She is always ill. I clean house and bring water from the wells. It is heavy and hard to walk with water. I play with friends when we go to wells.

(Saba, age 7 years)

I ran away from home because my father is a drug addict. He never sent us to school. He used to beat me very badly. My mother left home and we live with him now. I work in this shop now. The owner lets me sleep here. I will not go back to home because beating hurts.

(Sajid, age 9 years)

I was in school and then we became poor. I had friends in school. My brother goes to school but I don't go. I stay at home with mum and help her.

(Irum, 6 years)

We are poor now. I liked school because I had friends. I have more friends and I play in the street all day now.

(Imran, 5 years old)

These were common themes. In rural areas, children were more likely not to have attended school at all, owing largely to cost, distance and safety concerns. Respondents in urban areas had often moved from their villages for economic reasons. They were daily wage earners, without any qualification or even school education themselves. Their children might have attended school previously but had left even at this very early age. Among the reasons children dropped out from school was that the school could not cope with their learning difficulties, and they struggled to learn and had difficulties keeping up with other peers in the class. Their school experiences were often not happy ones. Without the necessary support, children disliked going to school and gradually their parents stopped sending them to school.

A parent of one child said:

He was always unhappy at school. He is slow in learning and the teacher always complained about him. We changed school as well, but he never liked going to school because it was difficult for him. He is at home now and we have arranged a private tutor for him. At least he is happy now and doesn't cry every morning.

Another child's father said:

There were lots of family problems. His mother does not live with us anymore. It is difficult for me to manage my job and his education. We live in a joint family and there are always people around him to look after but responsibility for his school is something no one cares about. I am not able to do it myself so I can't expect others to do so. It is just so difficult to manage.

Comparison between groups defined by pattern of school attendance

It is interesting to see how the four patterns of school attendance (both years, first year only, second year only and never) are related to test scores in each year. As expected, children who attended school in both years have the highest scores for all three outcomes (Table 5). The second highest scores in 2020 were for those children at school in 2020, but who were later found to have left. Those who did not attend school have slightly lower average scores. However, at this young age, the differences are not large. Children who were in school in the second year but not the first were likely to be younger, and had the lowest outcomes. This is probably related to their average age or stage of development at the time. They were just not at school yet.

The onset of the Covid-19 pandemic in 2020 and temporary lockdowns meant that most children did not actually attend school for some of this period, whether enrolled or not. This could have dampened the differences linked to school attendance or not. Anyway, we cannot attribute these differences in outcomes solely to school attendance at the outset, because of the pre-existing underlying differences between the groups in terms of background characteristics (see above). However, we can retain these groups (and so their characteristics) as they are, and see what happens when attendance at school changes after 1 year. This is the advantage of a natural experiment.

A year later, looking at the 2021 results, the situation is different (Table 6). All groups have improved their literacy, numeracy and social-emotional scores. This is largely a result not of

	Attended school both years	Attended school first year only	Attended school second year only	Did not attend school either year
Literacy score	57.05	33.40	26.22	28.63
Numeracy score	79.81	63.81	43.26	45.03
Social emotional score	56.27	50.55	42.85	43.54
IDELA total score	64.38	49.25	37.44	39.07

TABLE 5 Outcomes in 2020 by patterns of school attendance.

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	Attended school both years	Attended school first year only	Attended school second year only	Did not attend school either year
Literacy score	66.89	43.49	49.64	41.16
Numeracy score	85.28	61.54	69.20	54.46
Social emotional score	64.39	51.67	53.53	46.95
Total test score	72.19	52.23	57.46	47.52

TABLE 6 Outcomes in 2021, by patte	erns of school attendance
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school attendance but of increased age (and some parents reported using tutors, especially when local schools were closed). Children will learn rapidly at this young age, whether at school or not. One concern for this study is how to assess the benefit of learning from school attendance, over and above the learning that takes place anyway.

In the second year, the children who attended school for 2 years clearly still have the highest scores in all three outcomes. However, they are being caught up by the group of 180 children who had not attended school in 2020 but were now in school. This group has gone from easily the lowest scoring group in 2020 to the second highest in 1 year, and are beginning to catch up with the children who attended school from the outset. They still have the same characteristics and backgrounds. All that has changed is their age (which is the same as for all other groups) and their enrolment in school. This suggests a noticeable benefit for outcomes from attendance at school—the only remaining difference.

Those who have never attended school generally have the lowest scores by 2021, and those who dropped out of school after 2020 have scores that are hardly any better. The two groups who were not attending school in 2021 have made the least progress in all domains of the test. However, children who attended school in both years and those who started school in 2021 performed better than other groups, suggesting that school matters—for attainment and socialisation.

Looking at the progress the groups made in the 2 years, those who started attending school by the second year have made the largest gains for all outcomes (Table 7). This change over 1 year is expressed as effect sizes based on the overall standard deviations of the figures in Tables 5 and 6 (and which appear in brackets in Table 7). For this group the effect size for numeracy is an astonishing 1.01. Of course, this is a natural experiment with no randomisation, and this group started from the lowest base score in 2020, so had more latitude in making progress.

The gains for children attending school in both years are more modest but still substantial, especially considering that they started from a much higher base score in 2020. Again, it is clear that children are improving their literacy and numeracy scores whether they attend school or not. Yet those attending school from the outset have high scores, and those who enrolled in school within the year have high scores as well. Numeracy progress is noticeably greater for those attending school. Perhaps this is something that is harder to learn at home or in isolation than literacy is. The biggest difference lies in the social emotional development score. Those children not attending school by the end of year have substantially lower progress scores here. More than literacy and numeracy, socialisation does not happen at home for these young children in the same way as it does at school.

We observed that many children not in schools struggled with the language of emotions and feelings. They had lower scores than those who attended school in both years and in the second year. This was less because they had little empathy or sense of feeling for pain, happiness and sadness but perhaps more owing to a lack of vocabulary to name the appropriate emotions and feelings. Most children could identify what happiness is and what makes them happy, but identifying or recognising sadness and pain was difficult for many children not attending school. Those who attended school attributed sadness to experiences at school such as 'when teacher shouts at me', 'my friend hit me' or 'when no one plays with me'. We asked what makes them sad, one child said:

My mother does not live with us here. She has left us and now gone to another city and this makes me sad. I want her to come back home.

Simple comparisons between groups

An alternative way of looking at the data is to compare the effect sizes of the differences between the school attendees in 2021 and others, both for 2020 and 2021. How much more progress do those attending school in 2021 make?

In literacy outcomes, both those attending school and those not attending improved their scores over time (as above). However, the children attending school improved their scores by slightly more, with an effect size of 0.70 in 2020, growing to 0.75 in 2021 (Table 8). The children at school in 2020 were ahead at the outset, and pulled further ahead over 1 year. The initial gap between the two groups of children widened slightly over 1 year.

A common observation by the enumerators was that children who had a delay in language development sometimes struggled to communicate and engage in the research tasks and activities. There could be several reasons for this delay. Children from families with a high level of poverty clearly had limited opportunities for verbal engagement with parents. Many migrant workers' native language or dialect is different from what people usually speak in urban areas, including the language of instruction in schools in the Punjab, for example. Some children who were not attending school in the daytime when both parents were working spent long hours without the presence of an adult in the house every day. We asked parents how children spend their time if they do not attend school. The most common activities reported by their parents were that they play in the street with other children or stay at home locked inside watching TV or looking after, or being looked after by, other siblings. This was observed in rural areas and where workers moved from rural to urban settings and lived in temporary accommodation or rented servant quarters. Many migrant women worked as

	Attended school both years	Attended school first year only	Attended school second year only	Did not attend school either year
Literacy score	0.37 (26.31)	0.42 (23.82)	0.88 (26.65)	0.53 (23.08)
Numeracy score	0.28 (19.54)	0.10 (23.51)	1.01 (25.78)	0.43 (22.02)
Social emotional score	0.43 (18.81)	0.06 (19.09)	0.55 (19.35)	0.06 (20.05)

TABLE 7 Effect sizes for change over 1 year, by patterns of school attendance.

TΑ	BLE	8	Literacy scores by school attendance or not.
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	Literacy score 2020	Standard deviation	'Effect' size	Literacy score 2021	Standard deviation	'Effect' size
Attending school 2021	50.69	28.88	0.70	63.33	25.69	0.75
Not attending school 2021	30.31	22.38		41.98	27.72	
Total	47.68	28.94		60.17	28.45	

domestic helpers while men worked as security guards, drivers or domestic helpers. There were few opportunities for verbal interaction between such parents and their children. When we asked a mother working as a domestic helper in 10 different homes how she spends time with her children, she said:

When I come back home after a long day of working in homes, I am too tired to talk with anyone. I can't talk and it is just so difficult. I can just make dinner and make sure they have eaten enough, and they have some food for breakfast in the morning as I leave home very early. On weekends I have so much cleaning and work at home.

Another said:

There is so much to do at home. I spend all my day in cleaning, cooking and doing laundry. Children just play on their own.

The home environment of children from above average income groups had learning resources and materials and there was attention from parents to help learning activities in addition to attending school. Mothers' (usually) engagement in this process was in the form of reading stories, helping with homework, attending parent teacher meetings and studying together. Many families also had grandparents living in the household. Grandparents were helpful for working women as they provided support for childcare when mothers worked outside. Children had a stronger social network in the presence of grandparents and more opportunities for language development.

For numeracy, the effect size of school attendance (vs. not) is bigger than that for literacy, and it grows over time from an effect size of 0.79 in 2020 to 1.04 in 2021 (Table 9). Children attending school were ahead at the outset and improved further over 1 year. As noted above, it may be that numeracy is harder to learn informally than literacy for some children.

The same pattern appears for social and emotional development. Children attending school in 2021 are more developed in these respects than non-attenders and made more progress since 2020 (Table 10).

	Numeracy score 2020	Standard deviation	'Effect' size	Numeracy score 2021	Standard deviation	'Effect' size
Attending school 2021	72.27	25.79	0.79	81.96	21.83	1.04
Not attending school 2021	51.62	21.92		56.95	25.73	
Total	69.22	26.29		78.27	24.13	

TABLE 9 Numeracy scores by school attendance or not.

TABLE 10 Social emotional scores by school attendance or not.

	Social emotional score 2020	Standard deviation	'Effect' size	Social emotional score 2021	Standard deviation	'Effect' size
Attending school 2021	53.50	20.12	0.37	62.15	19.22	0.68
Not attending school 2021	46.00	19.60		48.61	20.78	
Total	52.40	20.21		60.15	20.03	

Regression models predicting literacy, numeracy and social emotion outcomes

The regression model for literacy omits both the sex of the child and whether they attended school in 2020 as relevant predictors of literacy scores once other factors are accounted for (Tables 11 and 12). Prior literacy score is, understandably, the main predictor. However, the next main predictor is whether the child was attending school in 2021. The increase in R^2 is small but it confirms what was suggested by the natural experiment. All children improve literacy, on average, over the year but the gain is a little greater for those who attend school. The explicit teaching and directed learning that take place at school are meant to enhance this natural early progress, but may not always do so to the extent that educators imagine.

The coefficients for the model are as might be expected. Literacy scores tend to be higher when the child is older, comes from a wealthier household, had a higher literacy score at the outset and attended school (Table 12).

The model for numeracy is similar (Table 13). Again, school attendance in 2020 and the sex of the child are not relevant. Here age is entered into the model before household assets. The overall model is stronger than for literacy. As suggested by the findings noted so far, the role of school is slightly greater for numeracy than literacy (additional R^2 of 0.05).

The coefficient for school attendance in 2021 is correspondingly higher (0.20 in Table 14). The model for social and emotional development is slightly weaker than for the academic outcomes, suggesting that this outcome is less predictable, using the kind of variables used

Step	R ²	Increase in R ²
Literacy score 2020	0.304	-
Attended school 2021	0.321	0.017
Sum of household assets	0.334	0.013
Age	0.350	0.006

TABLE 11Model for literacy score, 2021.

Note: Not relevant: Attended school 2020, child sex.

TABLE 12 Coefficients for model of literacy score, 20

Variable	Unstandardised coefficient	Standardised coefficient
Age in years	3.359	0.152
Sum of assets	1.846	0.157
Literacy score 2020	0.407	0.414
Child went to school 2021	9.444	0.118

TABLE 13 Model for numeracy score, 2021.

Step	R ²	Increase in R ²
Numeracy score 2020	0.336	-
Attended school 2021	0.382	0.046
Age	0.404	0.022
Sum of household assets	0.410	0.006

Note: Not relevant: Attended school 2020, child sex.

here. Yet again, there is a role for school attendance (Tables 15 and 16). Schools are about more than attainment. They are where children might learn to interact with others, including adults.

Schools provide more than learning experiences and tuition. Children can enjoy the social interactions. One girl aged 6 said:

I had lots of friends. I used to go to school. I had many cousins to play with. When we came in the city it is better, but I don't go to school anymore and I miss all my friends and cousins who I used to play with. Here we have a TV only and I just spend all day watching dramas. There is no one to talk. School is so much fun. I have friends and we play. At home it is nice but boring.

Other comments on the social aspects of school include:

I like playing with my school friends.

(Ayesha, age 4 years)

We have a big ground in school, and we play there.

(Salman, age 5 years old)

TABLE 14	Coefficients for model of numeracy score,	2021
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Variable	Unstandardised coefficient	Standardised coefficient
Age in years	3.806	0.202
Sum of assets	0.842	0.084
Numeracy score 2020	0.367	0.400
Child went to school 2021	13.756	0.202

TABLE 15Model for social emotional score, 2021.

Step	R ²	Increase in R ²
Social emotional score 2020	0.262	-
Attended school 2021	0.292	0.030
Sum of household assets	0.300	0.008
Age	0.311	0.011

Note: Not relevant: Attended school 2020, child sex.

 TABLE 16
 Coefficients for model of Social emotional score, 2021.

Variable	Unstandardised coefficient	Standardised coefficient
Sum of assets	0.962	0.116
Age in years	1.741	0.112
Social emotional score 2020	0.435	0.439
Child went to school 2021	8.409	0.149

I like school because we have a nice garden, and we play there. We have toys and computers in school. I like lunch time in school.

(Ahmed, 6 years old)

Of course, such friendships are not only possible at school:

I liked school. I had friends there but I have new friends now. I play with my new friends now. We play in streets now.

(Fahad, age 4 years)

However, some children, especially girls, sounded as though they were effectively trapped at home:

I help my mother. I cook and clean house. I have a younger sister who I look after and we play. I don't have any friend. We don't play outside because my mother does not let us play outside. She only let my brother go outside and play with his friends.

(Sana, age 6 years)

Some further barriers to school attendance

Children who were attending schools generally reported liking their school, seeing it as a fun place for activities and playing with other children. Going to school was also liked by these children because of the teachers and rewards they get for being 'good' in the class. The following quotations reflect children's reasons for liking school.

We watch cartoons in school. There is music as well. We sing poems with our piano teacher. I like when we watch TV in school and play in school. Our teacher Samiya is very nice. I like her very much.

(Amna, 5 years old)

Miss Salma is my favorite teacher. I like her. She says I am good. I always get a star on my work as well.

(Farah, age 6 years)

I like school because our teacher is very nice. She reads us stories and let us play in the ground. She also makes us do drawing and painting. I like drawing and colouring pictures.

(Salma, 5 age 5 years)

However, some children who had attended school but have now left at this early age did not enjoy it, either because it was seen as boring or because of reported abuse by teachers. Examples include:

School was nice because we played with friends. My teacher was not nice. She used to hit me when I was naughty. I don't want to go back there.

(Shazia, 5 years old)

I like playing with kids in the street more than going to school. I don't like studying at school. It is boring.

(Sarmad, age 7 years)

These are probably not the real reasons that the parents removed children from school. As above, poverty is a key justification for ceasing school, as much as not attending at all. There are personal/family reasons for ceasing school, and natural disasters like floods also made it impossible for children to continue their schooling.

There were floods in our village. And our school and houses were destroyed. I didn't go back to school after that.

(Farid, age 7 years)

School was nice. I don't go to school because my father lost his job and we are poor now. My teacher was always asking for fees and in the end he said don't come to school if your parents don't pay your school fee.

(Irfan, age 6 years)

I used to go to school. My father died and there was no one to look after us. I stopped going to school.

(Deeba, 6 years)

LIMITATIONS OF THE STUDY

This study did not randomise the cases, and did not try to correct for school attendance like prior studies using a regression discontinuity design, for example. In addition, the need to conduct the work outside schools via households, for obvious reasons in a study of school attendance or not, means that the sample size is relatively modest, especially for the group who never enrolled in school.

The non-school attenders often started with a low level in both literacy and numeracy—a position that might make it easier to show progress from. The tests used were relatively simple, and this might mean that the more advanced learning that could be taking place in school might not be fully registered by the test. It may be, of course, that other factors are involved, including unmeasured differences in the types of children attending and not attending school. The 'effect' sizes we report may have been affected (reduced) by the Covid lockdowns for part of the study, which will have reduced the difference in experience between school attendees and others to some extent.

Nevertheless, the study is both relatively large scale and in depth, and the findings are both interesting and challenging.

DISCUSSION

This study confirms several of the studies cited at the start, showing that children make clear progress in literacy and numeracy aged 4–8 whether they are in or out of school. This is good news because it shows that delaying exposure to school for a few months or even a year does not prevent a child from learning. Sometimes the premium for school attendance

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seems rather low, from our natural experiment or from the larger regression discontinuity studies in developed systems, in comparison with the progress that takes place anyway.

Nevertheless, children who attend school makes considerably more progress than those who do not, or who drop out. This progress is especially marked in numeracy, and in non-cognitive development. The most important and the biggest effect of school was on children's social emotional learning. Children who attended school compared with those who never attended school were more self-aware, had more friends to play with and could recognise emotions of empathy. This shows that schools are about much more than attainment. The impact of school on children's social emotional skills is substantial.

Of course, this all assumes that schools are benevolent and effective institutions. This is not always the case. In this study, children who had dropped out of school at an early age often reported that their life at school was stressful and dull, and that they had more fun after leaving school. Parents, and children, commonly reported that teachers' unfriendly behaviour, strict punishments and bullying were the reasons for their children's aversion to school. In our interviews, parents told us that they had received harsh comments from teachers. This was particularly so for parents with children with learning challenges. This can also be an issue in more developed systems. Teachers can be very good, but they can also be damaging whether intentionally or not (Gorard & Smith, 2010; Siddigui et al., 2023).

The bad news is that progress with or without schooling is then more related to family background and economic factors. Universal schooling in developed systems like that in England was introduced precisely because privileged children would tend to make good progress regardless of schools, with educated parents, tutors, books at home and other resources, but disadvantaged children not only faced the drag factor created by poorer nutrition, on average, but also tended to lack equivalent educational resources at home. In systems like that of Pakistan where schooling is not universal it is the poorest families, for the reasons they describe in this paper, who tend not to use schools. Yet it is these children who probably need school the most.

Poverty remains a significant barrier to education in many rural areas of India and Pakistan. The obstacles can be a lack of infrastructure, such as schools and transportation, economic barriers, such as costs of uniforms and textbooks, or opportunity costs of attending school, such as inability to earn a wage. However, over and above these barriers caused by fees, distance, the need to work and child-care, many of the stories related to us in our interviews suggest that parents face a learned subjective opportunity structure (Siddigui et al., 2023). The context and their experience have created a kind of learner identity that either does or does not encompass schooling as a key factor. To some extent, and only to some extent, the specific reasons given for using or not using schools may be merely attributed rather than the primary causes. For the poorest families the need to work and so provide food and shelter for their children is the priority. All else is considerably higher up the hierarchy of needs. Until and unless parents see the relevance of education, school attendance for the poorest will not be a priority. There also needs to be a societal change in attitude where education is valued more for its own sake. Perhaps with advances in technology and the kinds of labour needed, child labour will be in less demand, and childhood education more necessary and feasible.

The school 'effect' of attendance on progress is there and is noticeable. This may be especially important for the children from the poorest families least likely to use schools unless it becomes the norm. There is good evidence worldwide on how to improve enrolment and attendance at school in less developed systems like those described in this paper. This requires the funding of free school places, and perhaps incentives at the outset (Gorard et al., 2022). Governments should act on this robust body of evidence.

While it is recognised that access to education can promote equality by improving learning outcomes of poor children, thus closing the socioeconomic gaps, for children living in poverty-stricken areas, traditional schooling may not be accessible or feasible. Alternative methods of education could be conceived, for example, through distance learning and community-based programmes where community schools might use technology, such as digital education, so that children in remote communities can have access to learning without the need to travel long distances. Despite poverty most households had access to relatively low-cost technology such as TV and mobile phones. These alternative means can be useful tools to bridge the learning gaps between children and education where there is a complete disconnect from school.

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No conflict of authors.

DATA AVAILABILITY STATEMENT

The anonymised data can be made available upon request.

ETHICS STATEMENT

The project achieved ethics approval from School of Education, Durham Unviersity, Ethics Committee. The approval reference is EDU-2019-05-02T15:38:38-czwc58.

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REFERENCES

- Amrhein, V., Greenland, S., & McShane, B. (2019). Scientists rise up against statistical significance. Nature, 567(7748), 305–307.
- Amury, Z., & Komba, A. (2010). Coping strategies used by street children in the event of illness. https://media.afric aportal.org/documents/Coping_Strategies_by_Street_Children.pdf
- Armstrong, J. S. (2008). Statistical significance tests are unnecessary even when properly done and properly interpreted: Reply to commentaries. Available at SSRN 1153121.
- Baker, M. (2016). Statisticians issue warning on P values. Nature, 531(7593), 151.
- Bedard, K., & Dhuey, E. (2006). The persistence of early childhood maturity: International evidence of long-run age effects. *The Quarterly Journal of Economics*, *121*(4), 1437–1472.
- Berlinski, S., Galiani, S., & Manacorda, M. (2008). Giving children a better start: Preschool attendance and school-age profiles. *Journal of public Economics*, 92(5-6), 1416–1440.
- Black, M., Walker, S., Fernald, L., Andersen, C., DiGirolamo, A., Lu, C., & Early Childhood Development Series Steering Committee. (2017). Early childhood development coming of age: Science through the life course. *The Lancet*, 389(10064), 77–90.
- Blau, D. M. (2021). The effects of universal preschool on child and adult outcomes: A review of recent evidence from Europe with implications for the United States. *Early Childhood Research Quarterly*, 55, 52–63.
- Birchall, J. (2018). Early marriage, pregnancy and girl child school dropout. *Knowledge, Evidence and Learning for Development*, 2(7), 1–15.
- Burger, K. (2010). How does early childhood care and education affect cognitive development? An international review of the effects of early interventions for children from different social backgrounds. *Early childhood research quarterly*, 25(2), 140–165.

- Campbell-Barr, V. (2012). Early years education and the value for money folklore. *European Early Childhood Education Research Journal*, 20(3), 423–437.
- Chopra, N. (2016). Quality early childhood education for disadvantaged children: An investigation in the MCD schools. *International Journal of Early Years Education*, *24*(1), 49–62.
- Cliffordson, C., & Gustafsson, J. (2008). Effects of age and schooling on intellectual performance: Estimates obtained from analysis of continuous variation in age and length of schooling. *Intelligence*, *36*(2), 143–152.
- Coe, R. (2002). It's the effect size, stupid. *British educational research association annual conference* 12 (2002, BERA Conference), 14.
- Dahl, G., & Lochner, L. (2012). The impact of family income on child achievement: Evidence from the earned income tax credit. *American Economic Review*, 102(5), 1927–1956.
- Department for Education (DfE). (2020). *Early years entitlement: Local authority funding of providers*, Early_years_entitlements_local_authority_funding_of_providers_FINAL.pdf (publishing.service.gov.uk).
- Dobkin, C., & Ferreira, F. (2010). Do school entry laws affect educational attainment and labor market outcomes? *Economics of Education Review*, 29(1), 40–54.
- Downey, D., & Condron, D. (2016). Fifty years since the Coleman report: Rethinking the relationship between schools and inequality. Sociology of Education, 89(3), 207–220.
- Downey, D., Von Hippel, P., & Broh, B. (2004). Are schools the great equalizer? Cognitive inequality during the summer months and the school year. *American Sociological Review*, 69(5), 613–635.
- Ennew, J. (2003). Difficult circumstances: Some reflections on 'street children' in Africa. *Children, Youth and Environments*, 13(1), 128–146.
- Fredriksson, P., & Ockert, B. (2005). Is early learning really more productive? The effect of school starting age on school and labor market performance. SSRN: https://ssrn.com/abstract=760728; https://doi.org/10.2139/ ssrn.760728
- Grigg, J. (2012). School enrollment changes and student achievement growth: A case study in educational disruption and continuity. Sociology of Education, 85(4), 388–404.
- Gorard, S. (2021). How to make sense of statistics: Everything you need to know about using numbers in social science. SAGE Publications.
- Gorard, S., See, B., & Siddiqui, N. (2022). Making schools better for disadvantaged students. Routledge. https:// doi.org/10.4324/9781003287353
- Gorard, S., & Smith, E. (2010). Equity in education: An international comparison of pupil perspectives. Palgrave Macmillan. https://doi.org/10.1057/9780230277335
- Gottfried, M. (2010). Evaluating the relationship between student attendance and achievement in urban primary and middle schools: An instrumental variables approach. *American Educational Research Journal*, *47*(2), 434–465.
- Halpin, P., Wolf, S., Yoshikawa, H., Rojas, N., Kabay, S., Pisani, L., & Dowd, A. (2019). Measuring early learning and development across cultures: Invariance of the IDELA across five countries. *Developmental Psychology*, 55(1), 23.
- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, *312*, 1900–1902. https://doi.org/10.1126/science.1128898
- Hermanussen, M., Bilogub, M., Lindl, A., Harper, D., Mansukoski, L., & Scheffler, C. (2018). Weight and height growth of malnourished school-age children during re-feeding. Three historic studies published shortly after world war I. *European Journal of Clinical Nutrition*, 72(12), 1603–1619.
- Hillman, J., & Williams, T. (2015). Early years education and childcare. Nuffield Foundation Report, Early-yearseducation-and-childcare-lessons-from-evidence-2015.pdf (nuffieldfoundation.org).
- Hoskovcová, S., & Sikorska Iwona, M. (2014). Six or seven: When is a child resilient enough to start school and to cope with the transition stress? Czech and polish experience: Social policy and research outcomes. From Person to Society, 343, untitled (d1wqtxts1xzle7.cloudfront.net).
- Iqbal, N. (2020). PIDE knowledge brief, national poverty estimates 2018–19. Available at: National poverty estimates 2018 19 – PIDE – Pakistan's premier economic think tank advocating reform through socio-economic and public policy research.
- Krueger, A. B., & Card, D. (1994). The economic return to school quality: A partial survey, Working paper. Princeton Unviersity, econ-school.pdf (berkeley.edu).
- Levin, H., & Schwartz, H. (2012). Comparing costs of early childhood care and education programs: An international perspective. Hacienda Pública Española. Revista de Economía Pública, 201(2), 39–65.
- Li, H., Barnhart, H., Stein, A., & Martorell, R. (2003). Effects of early childhood supplementation on the educational achievement of womenm. *Pediatrics*, 112(5), 1156–1162.
- Lochner, L., & Monge-Naranjo, A. (2012). Credit constraints in education. *Annual Review of Economics*, 4(1), 225–256.
- Luyten, H. (2006). An empirical assessment of the absolute effect of schooling: Regression-discontinuity applied to TIMSS-95. Oxford Review of Education, 32(3), 397–429.

- Lynch, R., & Vaghul, K. (2015). The benefits and costs of investing in early childhood education: The fiscal, economic, and societal gains of a universal prekindergarten program in the United States, 2016–2050. Washington Center for Equitable Growth.
- Mamat, N., Razali, A., Hashim, A., Awang, M., Azman, M., & Fajrie, N. (2023). A comparing key performance indicator and benchmarks of quality pre-school among the agency in Malaysia. *International Journal of Evaluation and Research in Education*, 12(1), 505–516.
- Marcovitch, S., O'Brien, M., Calkins, S., Leerkes, E., Weaver, J., & Levine, D. (2015). A longitudinal assessment of the relation between executive function and theory of mind at 3, 4, and 5 years. *Cognitive Development*, 33, 40–55.
- Marzola, P., Melzer, T., Pavesi, E., Gil-Mohapel, J., & Brocardo, P. S. (2023). Exploring the role of neuroplasticity in development, aging, and neurodegeneration. *Brain Sciences*, 13(12), 1610.
- McCoy, D. C., Salhi, C., Yoshikawa, H., Black, M., Britto, P., & Fink, G. (2018). Home-and center-based learning opportunities for preschoolers in low-and middle-income countries. *Children and Youth Services Review*, 88, 44–56.
- Melhuish, E., & Gardiner, J. (2020). Study of early education and development (SEED): Impact study on early education use and child outcomes up to age five years, Research report. Department for Education.
- Morrissey, T. (2017). Child care and parent labor force participation: A review of the research literature. *Review of Economics of the Household*, 15(1), 1–24.
- Morton, E., Paul, T., & Megan, K. (2022). A Multi-State, Student-Level Analysis of the Effects of the Four-Day School Week on Student Achievement and Growth. (EdWorkingPaper: 22-630). Retrieved from Annenberg Institute at Brown University. https://doi.org/10.26300/p96h-8a41
- Niño-Zarazúa, M. (2019). Welfare and redistributive effects of social assistance in the Global South. *Population* and Development Review, 45, 3–22.
- Noble, K., Houston, S., Brito, N., Bartsch, H., Kan, E., Kuperman, J. M., Akshoomoff, N., Amaral, D. G., Bloss, C. S., Libiger, O., Schork, N. J., Murray, S. S., Casey, B. J., Chang, L., Ernst, T. M., Frazier, J. A., Gruen, J. R., Kennedy, D. N., Van Zijl, P., ... Sowell, E. R. (2015). Family income, parental education and brain structure in children and adolescents. *Nature Neuroscience*, *18*(5), 773–778.
- Nores, M., & Barnett, W. (2010). Benefits of early childhood interventions across the world:(under) investing in the very young. *Economics of Education Review*, 29(2), 271–282.
- OECD. (2018). Early learning matters: The international early learning and child well-being study. https://www. oecd.org/education/school/Early-Learning-Matters-Project-Brochure.pdf
- Pisani, L., Borisova, I., & Dowd, A. J. (2018). Developing and validating the international development and early learning assessment (IDELA). *International Journal of Educational Research*, 91, 1–15.
- Raudenbush, S., & Eschmann, R. (2015). Does schooling increase or reduce social inequality? Annual Review of Sociology, 41, 443–470.
- Reynolds, D., & Teddlie, C. (2001). Reflections on the critics and beyond them. School Effectiveness and School Improvement, 12, 99–113.
- Richter, L., Black, M., Britto, P., Daelmans, B., Desmond, C., Devercelli, A., & Vargas-Barón, E. (2019). Early childhood development: An imperative for action and measurement at scale. *British Medical Journal Global Health*, 4(4), 154–159.
- Rutter, M., & Maughan, B. (2002). School effectiveness findings 1979–2002. *Journal of School Psychology*, 40(6), 451–475.
- Save the Children. (2024). IDELA countries of implementation. Available at: Countries of implementation | IDELA (idela-network.org).
- Sharp, C. (2002). School starting age: European policy and recent research. NFER. https://defenddigitalme.com/ wp-content/uploads/2020/05/44414.pdf
- Sheldon, S. (2007). Improving student attendance with school, family, and community partnerships. *Journal of Educational Research*, 100, 267–275.
- Shonkoff, J., & Garner, A. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, 129, e232–e246.
- Siddiqui, N., Dixon, P., & Gorard, S. (2023). Is parental awareness of children's academic potential a good predictor of children's learning outcomes in early year's settings? Findings from two provinces in Pakistan and India. *Journal of Social Sciences*, 8(1), 8. https://doi.org/10.1016/j.ssaho.2023.100651
- Siddiqui, N., Gorard, S., & See, B. (2019). Can programmes like philosophy for children help schools to look beyond academic attainment? *Educational Review*, 71(2), 146–165. https://doi.org/10.1080/00131911.2017. 1400948
- Siddiqui, N., Stephen, G., Smruti, B., Saba, S., Hamza, S., Beng Huat, S., & Kiran, P. (2022). Does school matter for early childhood education? Assessing cognitive and wider development of children in the Province of Punjab, Pakistan and State of Gujarat, India. British Academy. Available at: Does school matter for early childhood education? Assessing cognitive and wider development of children in the Province of Punjab, Pakistan and State of Gujarat, India. Wider development of children in the Province of Punjab, Pakistan and State of Gujarat, India (worktribe.com).

- Slate, J. R., & Jones, C. H. (2005). Effects of school size: A review of the literature with recommendations. Essays in Education, 13(1), 12.
- Taggart, B. (2010). Vulnerable children: Identifying children 'at risk. In *Early Childhood Matters* (pp. 182–207). Routledge.
- Thomson, D. (2019). Some thoughts on 'the children leaving school with nothing. Report Family Fisher Trust (FFT), https://ffteducationdatalab.org.uk/2019/09/some-thoughts-on-the-children-leaving-school-with-nothing/
- Tran, T., Luchters, S., & Fisher, J. (2017). Early childhood development: Impact of national human development, family poverty, parenting practices and access to early childhood education. *Child: Care, Health and Development*, 43(3), 415–426.
- Tsai, W., Liu, J., Chou, S., & Thornton, R. (2009). Does educational expansion encourage female workforce participation? A study of the 1968 reform in Taiwan. *Economics of Education Review*, 28(6), 750–758.
- Tymms, P., Little, A., & Hodge, L. (2023). The economic benefits of effective reception classes in England. Research report. Department for Education. Available at: The economic benefits of effective Reception classes in England (publishing.service.gov.uk).
- Tymms, P., Merrell, C., & Henderson, B. (1997). The first year at school: A quantitative investigation of the attainment and progress of pupils. *Educational Research and Evaluation*, 3(2), 101–118.
- UNESCO. (2017). More than one-half of children and adolescents are not learning worldwide, UIS fact sheet no. 46.
- UNICEF. (2018). Out-of-school children in the Balochistan, Khyber Pakhtunkhwa, Punjab and Sindh Provinces of Pakistan. https://www.itacec.org/document/sector_plans/UNICEF_UIS_pakistan_oosc_report_2013_en. pdf
- Volpi, E. (2002). Street children: Promising practices and approaches, World Bank Report. https://ovcsupport.org/ wpcontent/uploads/Documents/Street_Children_Promising_Practices_and_Approaches_1.pdf
- Weaver, I. (2014). Integrating early life experience, gene expression, brain development, and emergent phenotypes: Unraveling the thread of nature via nurture. Advances in Genetics, 86, 277–307.
- World Bank Group. (2020). Gujarat Poverty, growth, and inequality (English). India state briefs Washington. http://documents.worldbank.org/curated/en/933681504004310148/Gujarat-Poverty-growth-and-inequality
- Xiao, Z., Kasim, A., & Higgins, S. (2016). Same difference? Understanding variation in the estimation of effect sizes from educational trials. *International Journal of Educational Research*, 77, 1–14.

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