Educational performances of children in primary grades in Andhra Pradesh, India

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Introduction:

Education is that which liberate man from all bondage. Education enables an individual to proceed towards light from utter darkness and towards immortality from mortality. Thus, it is a path to salvation. It helps bring out the best in a person. In the last decade, Indian has made tremendous progress in the field of elementary education. The enrollment rate has increased from 101.16 million in 2002-03 to 134.13 million in 2007-08 (Mehta, 2010). Gross enrollment rate at the primary level has also increased from 89.83 in 2003-04 to 118.62 in 2010-11 (NUEPA, 2012). Similarly, the literacy rates have increased from 65.38% in 2001 to 74.04% in 2011, a 9% increase in the last census year (Primary Census Abstract, 2011). But, these statistics does not show the state of quality of education, in particular, the family dynamics and its relation to educational outcomes.

To have a well educated society, it is important to make the foundation of the education system firm and dynamic. The foundation of the education is led when our children are at an early age. Alternatively, the education of an individual starts in tender age. At this age, say six years or less, kids are open to acquire all kinds of learning. Their understanding about the world is nascent. Nevertheless, children have tremendous capacity to learn and inculcate a variety of things. Therefore, it is the responsibility of the State in particular and the people in general to provide all necessary facilities and resources to our children. Furthermore, children constitute principle assets and are the future of a country. Their growth and development is as important as the development of material resources of the country. The best way to develop national human resources is to take care of our children. Primary education in this regard is the foundation stone. Primary education, that is, class I–VIII consisting of lower primary (I–V) and upper primary (VI–VIII) is the platform of the education system (Eleventh Five Year Plan Document, 2008). The plan document further states that education is the most critical element in empowering people with skill and knowledge and giving them access to productive employment in the future. It is the gateway of development. Realising this, all out efforts are being made by the Government of India for the growth and development of the elementary education in India. Significant progress has been made in various aspects of education. But, child development is a complex and continuous process so, much remains to be done.

India renews its commitments and determinations to give the highest priority to the basic needs and rights of all children. One of the important areas of prime importance, as envisaged by the government of India, is the primary education of our children. In this regard, the government of India has made certain legislations. Research shows that there are critical periods during the stage of young age for full development of brain's potential of a child. The formation of their attitudes and values as well as the desire to learn are also influenced at this stage, while lack of support or neglect can lead to negative

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consequences, sometimes irreversible. Early Childhood Education (ECE) requires that young children be provided opportunities and experiences that lead to their all-round development physical, mental, social, and emotional and school readiness. Alongside with health and nutrition, learning is also equally important. Learning at early stage must be directed by the child's interests and priorities, and should be contextualized by her experiences rather than being structured formally.

Child schooling and family: Family characteristics consistently influence the school enrolment in the primary grades and children from the more effluent families stay longer in the school (Ranasinghe et. al., 2002). One of the most important characteristics of the family is education of the parents, particularly, the mother. Literature also establishes this positive relationship. But, Motiram et. al., (2010) concluded that though the rate of literacy has increased over the period of time but, only a few percentages of women are able to teach and train their own children. Using data on the schooling of family members, including the father, mother, and wife, Jin-Tan et. al., in 2000 identified substantial effects of family background on returns to schooling in Taiwan. On the other hand Parfait et. al., (2006) has examined the effect of the family size on schooling in Sub-Saharan African settings. They found that there is a positive association between sibling size and schooling in urban areas but, not in rural areas. In India, using two nationally representative datasets, Chudgar (2009) found that a marginal improvement in maternal literacy has an especially large association with improvement in the school outcomes of children, especially girls.

Parent's aspirations and motivations have long term effect on children and appreciably design their schooling. Greater involvement of parents results in better achievement of children (Fan et. al., 2001). They also believed that educated parents send their children to the school at an early age. Policymakers are also of the opinion that maximum output of children schooling can be achieved by involving the parents in the education system. This is possible by regular teacher-parent interaction and discussion (Hong et. al., 2005).

Family size and, more importantly, sibling size are important elements of family. Large family and sibling size lead to less education (Alison et. al, 2009). Even in worst condition, parent may not send their kids to school at all. This phenomenon is largely seen in case for girls than boys. In the poor families, sibling size is usually larger which keep the girl child at the risk of not sending to the school. These kinds of practices are culturally bonded and largely responsible for gender differences in school enrollment and drop-out (Lincove, 2009). Using micro-data from a field survey of children in rural Andhra Pradesh, India, Ota et. al., in 2007 estimated econometric models which aim to identify the key explanatory factors in the decision on schooling. The approach adopted is to focus on the effects of sibling competition within the household, by paying close attention to the number, age and gender of a child's siblings, while also taking account of the characteristics of the household and community. Their findings suggest that the schooling decision depends as much on the child's characteristics and position within the household, as on the circumstances in which the child lives.

A follow-up study was conducted by the National Institute for Child Health and Development (NICHD) (2005), in the US, to find out the association between early child care and children's functioning through the end of the third grade. It was found that high quality child care continued to be linked to higher scores in math, reading and memory. Interestingly, the study found that more hours of care were linked

to poorer work habits and poorer social skills. The findings of the study support the relative independence of quality, quantity and type of child care in relation to child development outcomes.

Child schooling and poverty: Jacoby (1994) was the first to show empirically that income of the household has a noticeable impact on school attendance in poor settings. He again emphasized that this effect stemmed mainly from those households which were credit constrained. There are studies that have highlighted that children living in poverty stricken household have less opportunity to attend school and progress (Lloyd et. al., 1996). Similarly, children living in poverty tend to have increasing levels of disengagement from school and poor academic outcomes (Alexander et. al.,, 1997; Duncan et. al., 2005 and Hauser et., al., 2006). Furthermore, Evans et. al., (2004) has concluded that children living in poverty are often exposed to multiple risk factors in their families, schools, and communities that can accumulate to produce poor outcomes. In 2001, David has extensively examined the effect of poverty on children's education in Kinshasa, Congo. He found that despite the presence of a considerable degree of inter-household resource transfers in support of children and their education, poverty has a substantial impact on the demand for schooling, school enrollment and educational attainment. He categorically added that while increased economic well-being is associated with significantly greater educational attainment for both females and males, it is not the case that improved economic status necessarily translates into reduced gender differences in school outcomes. It is also apparent from his study that young children from low-income households are more likely to delay initial entry into school. He finally concluded that later entry, lower subsequent enrollment rates, an increased likelihood of repeating grades and eventually dropping out, and hence slower progress in reaching given educational levels, all appear to be consequences of coming from the poverty of households. Grimm (2011) in his paper analyzed the income elasticity of school enrolment in an African, poor and rural context. He found strong and robust effects. Relying on an instrumental variable strategy for identification, the estimates suggest that a decline in income by ten percent causes a decline in enrolment rates among boys six to thirteen years old by about 2.2%–2.8%. Also, the estimates are slightly higher for girls than for boys.

A number of studies have emphasized the importance of household income when parents have to decide whether to send their children to school or not (Cogneau et. al., 2008; Glewwe et. al., 2004; and Deininger, 2003). Family income has been shown to matter in particular in settings where households face liquidity constraints, caused by the lack of insurance and limited possibilities to smooth consumption through credit and savings (Jacoby et. al., 1997; Beegle, et. al., 2006). In such a context recurrent shocks to household income frequently force family to withdraw their children from school or not to enroll them in the first place (Yamano et. al., 2005). Subsequently, the children are either out of school or there is gap in their schooling. There is one interesting study by Francavilla (2011) in which mother's employment and children's schooling in India has been studied. Using the second round of the National Family Health Survey data, his results of a multilevel probit model showed that the correlation between mother's employment and their children's schooling is negative. Women in poorer households are more likely to work but, given the negative correlation, their additional income does not seem sufficient to enable children's school attendance. A sensitivity analysis on wealth deciles shows that this negative relationship disappears in urban areas and becomes weaker in rural areas at the top wealth deciles.

Some authors have suggested certain remedial action to come out of this situation. For example, Deininger (2003) has advocated that reduction of fees for primary education, together with a massive program of dissemination, decentralization, awareness building and mobilization at the local level, has been effective in increasing primary attendance by the poor and eliminating gender bias in the access to primary education.

Child schooling, health and nutrition: Alderman et. al., (2001) carried out a research, employing a longitudinal data to investigate the impact of child health on school enrolments in Pakistan using an explicit dynamic model. These estimates use price shocks when children were of pre-school age to control for behavior determining the child health shock measures. They indicated that child health is three times as important as suggested by new estimates that assume that child health is predetermined rather than determined by the household choice in the presence of unobserved factors such as preferences and health endowments.

Considering the fact that primary enrolment rates are very high in Peru, but so are the failure and drop-out rates, Pal conducted a study in 2004. She thinks that there should be an understanding of the nature of child schooling and should consider school progression from primary to secondary and higher levels, taking into account the conditional sequence with the previous level and self-selection into the next higher level of schooling. Using a unique correlated sequential probit model with unobserved heterogeneity this paper does so and obtains richer results, argued to be better than the standard static estimates. It is shown that the same set of individual/parental/household characteristics may affect different levels of schooling differently.

Wisniewski (2010) estimates the impact of nutrition and health problems on test scores of grade four students in Sri Lanka using a rich dataset on child height, weight, hearing and vision problems, helminthes infections, malaria, and micronutrient deficiencies. The results showed that stunting and hearing problems in children have direct impact on tests scores and an indirect effect as parents may adjust to small changes in nutrition and health by changing the education inputs provided to their child.

A study to investigated relation between varieties of health conditions and test scores for children and adolescents using data from the Child Development Supplement of the Panel Study of Income Dynamics was conducted by Eide et. al., in 2010. In addition to estimating how health conditions are associated with test scores ‘on average,’ the statistical methodology of the paper estimates this association at different points of the conditional test score distribution. Such information could be crucial for policy purposes because the relation between health and academic achievement may be different for students at the bottom and top of the test score distribution. They found that several health conditions are highly negatively correlated with Mathematics and Reading test scores, both on average and at different points of the achievement distribution.

Rationale of the study:

There is wide agreement among researchers that primary education is the foundation stone of the educational development and thus development of the country. Nevertheless, not much attention has been paid by the social scientists in general and demographer in particular of the developing countries, including India. Though, there are studies related to primary education of children in the developing countries, including India, which extensively and effectively captured the quantitative aspects of

schooling like, net and gross school enrollment, retention of children in the school, drop-out etc. Also there is literature suggesting familial background, more specifically mother's educational background and economic characteristics of the family do play important roles in the schooling of children. At the same time, there are studies pertaining to child development in general and child health and schooling in particular, establishing association between these two. However, some of the studies from India have demonstrated that better child health improves school enrolment, and drop out increases if the child is not healthy, especially for girl child. In addition, it is equally essential to know the educational performance of children in the school. Furthermore, enormous efforts are being made by the government of India to achieve the goal of universal primary education. Therefore, it becomes extremely important to explore and examine the quality of primary education and its various dimensions.

Objectives:

The broad objective of the study is to evaluate the educational performance of the children in the primary grades with respect to several child level, mother level and household level characteristics. In addition, the study also endevours to identify regional difference in the educational outcome of children in the primary grades.

1. To examine the performance of reading, writing and mathematical ability of children with respect to selected background characteristic in the primary grades in Andhra Pradesh, India
2. To find out factors affecting reading, writing and mathematical ability of children

Source of the data:

The present study uses the Young Lives data, being collected in four countries. The Young Lives is a long-term international research project investigating the changing nature of childhood poverty in four developing countries namely, Ethiopia, Peru, India (Andhra Pradesh) and Vietnam for over 15 years. This is the timeframe set by the United Nations to assess progress towards the Millennium Development Goals (Galab et al., 2008). As a policy-oriented project, research findings of the Young Lives will be used to help formulate future policies aimed at alleviating childhood poverty. The Young Lives research is coordinated by an academic consortium involving the University of Reading, the London School of Hygiene and Tropical Medicine, South Bank University, the University of Sussex, the South African Medical Research Council and Save the Children, UK. In India, this study has been implemented in Andhra Pradesh in association with two organizations namely, Centre for Economic and Social Studies (CESS), Hyderabad, and Save the Children UK (India).

The third round of the data conducted in the year 2009-10 has been used for the study. The total sample size of the study is 1951. The Young Lives study has been following two cohorts of children. Children in the age-group 6 to 17 months and children in the age-group 7.5 to 8.5 years, in 2001-02, are the first cohort (index children) and the second cohort respectively. It is imperative here to reveal that the second cohort of children has been taken for comparison purposes with respect to the index children. For the first and the second cohort, 2000 and 1000 children will be followed respectively, for over 15 years in each country, including India. Alternatively, the Young Lives will follow all sampled children in each country till the youngest cohort becomes 15 years old (up to 2016-17). Therefore, the children and their

households are being revisited in every three to four years for data collection. Till date, three rounds of data collections have been completed (2001-02; 2005-06 and; 2009-10). The present study uses third round of the data, collected in 2009-10 from Andhra Pradesh (India).

Analytical Strategy:

Bi-variate analysis has been used to examine the status of educational performance with respect to various background variables. Young Lives study has conducted Peabody Picture Vocabulary Test (PPVT) to know the educational performance of children. The test has been administered for reading, writing and mathematical ability for students in grade 1 to 4. In the bi-variate analysis, there are four categories of reading results. These are "can read letters", "can read words", "can read sentences" and "cannot read". Similarly, there are three categories of writing results like "write with errors or difficulty", "write without errors or difficulty" and "cannot write". Finally, for the mathematical ability results there are only two categories namely "correct" and "incorrect". Binary logistic analysis has been performed for each of the test results namely reading, writing and mathematical ability separately. In the first model, the dependent variable, that is reading, has been made dichotomous by clubbing "cannot read", with "can read letters" and "can read words". Thus, the dichotomous categories of reading are "can read sentences" and "cannot read sentences". For the second model, similar method has been adopted. Here, "cannot write" has been clubbed with "write with errors or difficulty", thus, forming the dependent variable in two categories namely, "write without errors or difficulty" and "cannot write without errors or difficulty". In the third model for mathematical ability, no change has been done in the dependent variable which is "correct" and "incorrect".

The independent variables are of three types, that is, child level variables, school level variables and household level variables. Child level variables include, sex of the child, child's grade in the school, body mass index (BMI), sibling composition, serious illness and child work. School level variables include type of the school and Mid-day Meal served in the school. Similarly, household level variables include education of the mother, wealth index, place of residence, region of residence and the caste groups. It is important here to mention that the PPVT test has been administered on children in the age group 8.5 years to 9.5 years in different grades of their schooling.

Results and findings:

The result of the reading, writing and mathematics tests illustrate that there is wide variation in the test scores of the students according to the selected background variables. Also, the result of the same background variable is not consistent throughout the three different tests, that is, reading test, writing test and mathematical ability test.

Children characteristics and school outcome: - The performance of boys is better than that of girls in reading, writing and mathematics ability tests. Though there are 53% boys who have difficulty in writing or they cannot write compared to 47% girls (Table 1). Similarly, in the case of mathematical ability test, there are around 70% boys who have committed mistakes out of total students who have committed mistakes in solving mathematics problems. But, in the case of reading test, 40% boys cannot read and 60% girls cannot read out of total students who cannot read in Andhra Pradesh. In the case of reading and writing, 67% and 65% boys can read and write correctly without mistakes whereas, only

33% and 35% girls can read and write correctly without mistakes. Similarly, in the case of mathematical ability, out of the total correct results of the students, again 67% boys have correct results as compared to only 33% girls. So, there is a wide variation in all three tests between boys and girls. This may be because of the selective treatment of boys over the girls. It is found that as the students move in the upper grade in the school, there is improvement in the all three tests results. In the case of the reading test, there are 37% students who cannot read but, this percentage has decreased to 13% when the students are in the fourth grade. Students in the grade 2 and 3 are performing better in the three tests than students in grade 1.Similar results have been found in the case of writing and mathematical ability. The bi-variate also indicated that the health of the child, which has been measured in terms of the BMI of the children, is directly proportional to the test outcomes. Because 66% and 64% students cannot read and write whose BMI is less that is who are or healthy. It is pertinent here to mention that children with low BMI have been considered as not healthy compared to children with standard BMI. Obese children have excluded from the analysis because of less representation. Likewise, there are 17% and 19% children with serious illness can read and write sentences correctly. Also, their correct mathematics score is also only 17%. It is also important here to mention that serious illnesses of children for the last one year prior to the survey have been considered. In mathematics test, children from the public school are performing better (60%) than children studying in the private school (40%). But, otherwise is the case when it comes to reading and writing. Similarly, percentages of children who are getting Mid-day Meal in the school are performing better in reading and writing tests, but not in mathematics. The percentage of reading, writing and mathematics score is less for children engaged in any kind of economic work than those children who are not engaged in any economic work.

Household characteristics and school outcome: The existing body of literature suggests that there is a very strong and positive relationship between education of the mother and the educational outcome of the children, particularly their test results. 51% children whose mothers are not educated cannot read. on the other hand, 28% and 20% children cannot read and their mothers are primary and above educated respectively. In the case of the writing test, the situation is the same, but the magnitude is little less. Here 39% children cannot write correctly if their mothers are not educated and 30% children cannot write if their mothers are educated. The bi-varite analysis depicts that the mothers education has little to say in the case of the mathematical ability test. Since 30% children have incorrectly solved mathematical problems whose mothers are no educated whereas, 37% and 34% children have solved the mathematical problems incorrectly and their mothers are primary and higher educated respectively. The result also shows that in the case of reading words and reading sentences, mothers education is important. The children belonging to mothers who have more than primary education are showing better results in the case of writing. There are 46% children who can write without difficulty and error whose mothers are more than primary educated whereas, there are 41% children who can write without difficulty and error whose mothers are only primary educated. In the case of the mathematical ability test, only 28% children can solve the problems correctly whose mothers are no educated whereas; 40% and 32% children can solve mathematics correctly whose mothers are primary and more than primary educated respectively. The results of the three tests are fairly equally distributed among different economic classes. Children belonging to the rich households can read sentences correctly (40%) whereas, 12%

children belonging to poor households can read sentences correctly. But, in the case of mathematics test, there seems that economic status has little to say because the test results of children are homogeneously distributed among children belonging to differently economic classes. The percentages of students with good reading and writing scores are more in urban areas than in rural areas. For example, 67% and 64% students from urban areas can read sentences and write without error respectively. But, in case of mathematics test scores, percentages of rural children with correct answers are more than urban children. Such as, 51% student belonging to rural areas have solved mathematics test correctly whereas, 49% students from urban areas could solve the mathematics test correctly. The results suggest that there is regional difference in the results of the students in all the three tests. It shows that the coastal region of the state of Andhra Pradesh demonstrates better educational outcome compared to Rayalaseema and Telangana. Children belonging to coastal Andhra Pradesh read sentences without error (43%) and write without error (50%), whereas in the case of Rayalaseema only 37% students could read sentences without errors and 27% students could write sentence without any error. Similarly, 24% and 23% students from Telangana could read and write sentences without error respectively.

The logistic regression analysis shows that boys with respect to girls, grade 2 and grade 3 students, children engaged in any economic activities, children getting the mid-day meal in the school and children belonging to OBC caste group are statistically significant predictors of all tests with varying magnitudes. A child getting mid-day meal is the most potent factor (3.08 times) for the writing test. Similarly, in the case of the mathematical ability test, children belonging to coastal Andhra Pradesh are statistically significant predictor of mathematical ability test as compared to children belonging to Telangana. Highly educated mothers are statistically significant determinant for reading test, but not in writing test of children as compared to children belonging to not educated mothers. Children belonging to primary educated mother are performing better (1.06 times) in the mathematics test than children belonging to uneducated mothers. Children belonging to coastal Andhra Pradesh are showing good results in writing and mathematics than children belonging to Telangana region.

Conclusions and discussions:

The study concludes that though the gross enrollment rate has increased to 118.62 but, still there are large percentages of boys and girls in the primary grades who are not able to read and write. But, their mathematical abilities are relatively better than reading and writing. The predictors of better reading and writing are almost similar with differing magnitudes. Along with other variables, children receiving the mid-day meal are the most important determinants for better writing results. Therefore, it seems that the government program of distributing mid-day meal in each primary school has not only increased the enrollment but, also contributed in the educational performance of the children. Children in grade 2 are most important determinants for better reading results. Similarly, along with other variables children in the grade 4 are most significant determinant for the better mathematical results. Older siblings are important predictor of mathematical ability test as compared to younger siblings. This may be because the older siblings may teach mathematics to their younger siblings.

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Table 1. Percent distribution of results of reading, writing and mathematics test of students in the primary grades with respect to selected background characteristics in Andhra Pradesh, India, 2009-10.

Background characteristics	Reading Test					Writing Test				Mathematics Test		
	N	Read letter	Read word	Read sent-ence	Can't read	N	With error	Without errors	Can't write	N	Cor-rect	Inco-rrect
Sex of the child	1920					1912				1898		
Boys	1018	58.2	60.9	67.1	39.0	1006	40.1	64.6	53.2	987	67.4	69.4
Girls	902	41.7	39.2	32.9	61.2	906	59.9	35.4	46.8	911	32.6	30.6
Child's grade	1743					1735				1579		
Grade 1	230	35.2	13.3	10.9	36.9	229	14.2	10.2	47.7	200	12.0	37.8
Grade 2	455	5.3	26.1	25.8	29.3	453	25.6	25.4	21.2	409	25.4	25.4
Grade 3	748	43.3	45.6	45.0	20.8	743	41.9	45.0	17.9	680	44.5	19.6
Grade 4	310	16.3	14.0	19.4	13.1	310	18.3	19.5	13.2	290	18.0	17.2
BMI	1899					1890				1709		
Healthy	816	34.3	35.4	47.9	34.3	814	59.5	51.5	35.7	750	44.3	40.5
Not Healthy	1083	65.7	64.6	52.1	65.7	1076	40.5	48.5	64.3	959	55.7	59.5
Siblings	1246					1241				1718		
Younger siblings	490	35.9	32.0	33.7	40.9	488	32.4	33.9	39.5	587	33.4	40.1
Older Siblings	756	64.1	68.0	66.3	59.1	753	67.6	66.1	60.6	1131	66.6	59.9
Serious illness	1889					1880				1702		
No	1534	80.8	81.4	83.0	72.2	1534	81.1	80.6	76.3	1391	82.4	76.8
Yes	355	26.8	18.6	16.9	26.8	355	18.9	19.4	23.7	311	17.6	23.2
Type of School	1875					1866				1692		
Public	839	42.7	43.2	48.2	34.1	834	38.5	51.6	40.2	770	60.2	54.2
Private	1036	57.3	56.8	51.8	65.9	1032	61.5	48.4	59.8	922	39.8	45.8
Mid-day meal	1895					1887				1717		
Yes	970	64.6	49.5	40.8	79.0	963	60.9	34.4	69.6	853	49.1	54.3
No	925	35.4	50.5	59.2	21.0	924	39.1	65.6	39.1	864	50.9	45.7
Child's work	1908					1899				1718		
No	1245	62.8	71.5	66.3	59.5	1240	64.1	67.8	63.8	1141	67.9	54.8
Yes	663	37.2	28.5	33.7	40.5	659	35.9	24.3	36.2	577	33.6	45.2
Mother's Education	1914					1906				1847		
No education	857	24.2	29.3	27.1	51.5	853	38.7	12.7	38.9	846	27.9	29.3
Primary education	573	40.0	36.1	36.3	28.6	572	42.4	41.1	31.4	558	39.7	36.5
Above Primary	484	35.8	34.6	36.6	19.8	481	18.9	46.2	29.7	443	32.4	34.2
Wealth Index	1890					1881				1701		
Poor	636	39.8	30.6	31.0	43.6	634	35.7	28.8	43.0	562	33.4	35.2
Middle Class	685	33.9	34.2	32.3	33.2	681	35.9	30.9	33.3	616	33.0	32.1
Rich	560	26.3	35.3	36.8	23.2	566	28.5	40.2	23.7	523	33.6	32.7
Place of residence	1916					1907				1901		
Urban	678	40.9	42.5	67.2	37.3	766	47.2	64.4	39.9	799	49.0	53.0
Rural	1238	59.1	57.5	32.7	62.7	1141	52.8	35.6	40.1	1102	51.0	47.0
Region of residence	1919					1912				1899		
Coastal region	472	30.5	34.9	42.6	33.3	511	32.5	50.1	20.0	506	36.4	25.5
Rayalaseema	689	34.8	29.4	34.0	29.1	663	37.9	26.8	37.2	659	30.7	32.9
Telangana	758	34.7	35.7	24.4	37.6	738	29.5	23.1	42.3	734	32.8	41.6
Caste group	1890					1881				1703		
Others	368	18.0	17.0	23.1	11.7	368	14.8	26.1	13.5	350	20.8	18.6
OBCs	937	40.4	52.5	49.2	47.0	929	53.1	47.3	48.4	838	50.2	41.2
SCs + STs	585	41.3	31.4	27.7	41.3	584	32.1	26.6	38.1	515	29.0	40.2
Total	1930	20.8	14.6	52.4	11.1	1930	32.4	42.9	23.0	1930	78.8	10.2

Table 2. Logistic regression analysis of child level characteristics, school level characteristics and the household level characteristics on reading, writing and mathematics test scores, 2009-10.

Background characteristics	Model I Reading Test	Model II Writing Test	Model III Mathematics Test
Sex of the child			
Girls [R]			
Boys	1.39*** (CI=1.17-1.85)	1.20*** (CI=0.80-1.49)	1.40*** (CI=.85-1.82)
Child's grade			
Grade 1[R]			
Grade 2	2.02*** (CI=1.38-2.95)	2.04*** (CI=1.37-3.04)	1.22*** (CI=0.89-1.78)
Grade 3	1.34*** (0.97-1.84)	1.38** (CI=1.04-1.92)	1.16*** (CI=0.96-1.66)
Grade 4	1.27 (CI=0.94-1.67)	1.21 (CI=0.90-1.62)	1.68 (CI=1.17-2.13)
BMI			
Not Healthy [R]			
Healthy	1.30*** (CI=1.06-1.59)	1.23** (CI=1.01-1.52)	1.40 (CI=1.01-1.94)
Siblings			
Younger siblings [R]			
Older Siblings	1.06 (CI=0.78-2.91	1.14 (CI=0.84-1.30)	1.27*** (CI=0.80-1.95)
Serious illness			
No [R]			
Yes	1.11 (CI=0.94-1.59)	1.27 (CI=0.96-1.67)	0.91 (CI=0.63-1.58)
Type of School			
Public [R]			
Private	1.25** (CI=0.89-1.61)	1.19*** (CI=0.87-1.53)	1.37 (CI=1.06-2.13)
Mid-day meal			
No [R]			
Yes	2.28*** (CI=1.85-2.81)	3.08*** (CI=2.48-3.82)	1.02*** (CI=.71-1.88)
Child's labour			
Yes [R]			
No	1.41*** (CI=1.17-1.62)	1.58*** (CI=1.17-2.39)	1.39*** (CI=1.11-2.01)
Mother's education			
No education [R]			
Primary education	1.39 (CI=0.92-1.88)	1.14 (CI=0.87-1.62)	1.06*** (CI=0.76-1.97)
Higher education	1.23*** (CI=0.83-1.89)	1.31 (CI=0.86-1.97)	1.44 (CI=1.09-1.77)
Wealth Index			
Poor [R]			
Middle Class	1.20*** (CI=0.99-2.14)	1.13 (CI=0.71-1.52)	1.24*** (CI=0.97-1.68)
Rich	0.87 (CI=0.56-2.48)	1.29 (CI=0.87-1.83)	1.08 (0.84)-1.68)
Place of residence			
Rural [R]			
Urban	1.08*** (CI=0.98-1.33)	1.31*** (CI=0.94-1.82)	1.37 (CI=1.07-2.24)
Region of residence			
Telangana [R]			
Rayalaseema	0.93 (CI=0.68-1.74)	1.09 (CI=0.72-1.39)	1.00 (CI=0.59-1.48)
Coastal region	1.16** (CI=1.07-1.51)	1.22*** (CI[=1.07-2.26)	1.41*** (CI=1.03-2.17)
Caste group			
SCs + STs [R]			
OBCs	1.21*** (CI=1.08-1.43)	1.59*** (CI=1.14-2.27)	1.43** (CI=0.97-2.21)
Others	1.15 (CI=1.19-1.56)	1.33 (CI=0.92-1.65)	1.50 (CI=1.02-2.11)

Note:- 1) * p<0.01; ** p<0.05; *** p<0.001. **2)** [R] = reference category