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When Free Lunch Is Not Free: The Hidden Trade-offs of India's School Feeding Scheme

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Abstract

This paper examines how large-scale in-kind transfer programs influence household investment decisions in education. We study the midday meal (MDM) scheme in India—the world's largest school feeding program—using data from the 2005–06 Indian Human Development Survey (IHDS). The staggered rollout of the program in primary education across states provides exogenous variation in exposure. We find that exposure to the program significantly reduces school fees, largely due to increased enrolment in government schools. However, this shift is accompanied by a decline in children's reported treatment by teachers and a reduction in parental confidence in schools, suggesting a deterioration in the perceived quality of the learning environment. To offset these perceived quality declines, parents increase their investment in private tutoring, ultimately resulting in no net change in total educational expenditure. Heterogeneity analysis reveals that these effects are more pronounced among older children, while no significant gender-based differences are observed. These patterns underscore the complex behavioral responses of households to public programs and highlight the importance of complementing such schemes with quality-enhancing interventions in public education.

Keywords: midday meal, parental investment, learning environment

JEL: D13, I21, I22, I25, O12

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1 Introduction

Government transfer programs often aim to relax household budget constraints and improve human capital outcomes, yet their indirect effects on private behavior remain empirically under-explored. In the context of education, one pertinent question is whether publicly provided in-kind benefits—such as free school meals—crowd in or crowd out parental investment in children's education. This paper examines this question in the setting of India's midday meal (MDM) scheme, the world's largest school feeding program, which offers free lunches to children in government and government-aided primary schools. While the midday meal program was instituted to address nutritional deficits and incentivize school participation, its broader effects on household education choices and expenditure patterns remain less well understood. In this paper, we exploit the staggered implementation of the program across different states in India to causally study the impact on parental investment in education. We conduct a holistic analysis of parental educational expenditure by examining three distinct categories of spending: (i) school fees, (ii) spending on books, uniforms, and transport, and (iii) private tutoring. In doing so, we also examine whether the program induced substitution across these different types of educational expenditures.

Our study primarily contributes to the following strands of literature. First, we add to the evidence on the effects of government benefit programs on human capital outcomes, particularly in developing country settings. Alderman and Bundy (2012) and Jomaa et al. (2011) provide reviews on the relationship between school feeding programs and children's health, nutrition and educational outcomes. School feeding programs have been shown to improve school attendance and enrolment (Bundy et al., 2013; Zenebe et al., 2018), test scores (Chakraborty and Jayaraman, 2019; Aurino et al., 2023), cognitive functions (Cueto and Chinen, 2008; Metwally et al., 2020) and health outcomes (Wang and Fawzi, 2020) among others. In the Indian context, several studies have specifically examined the midday meal program and its effects on health and nutritional outcomes (Khera, 2013; Anitha et al., 2019; Mohan and Thakkar, 2019) and enrolment and learning outcomes (Bonds, 2012; Jayaraman and Simroth, 2015; Chakraborty and Jayaraman, 2019). Our study complements this work by shifting the focus from child-level out-

comes to household behavior, exploring how school feeding affects the way families allocate educational resources.

Second, we contribute to literature studying how in-kind public programs shape household decisions around human capital investment. While school feeding programs are widely promoted as tools for improving nutrition and school participation, their indirect effects on parental education investments, an essential driver of long-run human capital accumulation remain underexplored. Parental investment in children's education is widely recognized as a key early-life input influencing both health and cognitive outcomes. A large body of evidence shows that early interventions—including those in education and health—can improve long-run well-being, including labor market outcomes ((McEwen, 2003; Johnson and Schoeni, 2011; Bharadwaj et al., 2013; Haire-Joshu and Tabak, 2016)). Among these, parental education investments are especially critical (Yeung et al., 2002; Francesconi and Heckman, 2016; Abufhele et al., 2017), making it important to understand how public programs shape these decisions.

A closely related study is by Wang and Cheng (2022), which examines the impact of participation in China's Nutrition Improvement Programme (NIP) on household education expenditure. While Wang and Cheng (2022) find that China's more targeted rural program increased in-school expenditures such as school fees and textbooks, we observe a decline in school fees, likely reflecting a shift from private to public schooling in India where education is largely free. Additionally, we find an increase in spending on private tutoring, whereas Wang and Cheng (2022) report no significant change in out-of-school expenditures. These divergent results may stem from contextual differences: in China, affordable in-school tutoring arranged by parents is common and trusted, while in India, declining parental confidence in public school quality may have driven households to rely more on out-of-school private tutoring. These contrasts underscore the importance of institutional and cultural settings in shaping household responses to similar policy interventions. Further, by unpacking the composition of education spending into its granular components as opposed to inside versus outside school, our study provides a detailed understanding of how households adjust their investments in response to in-kind transfers. This approach offers a rich picture of the indirect effects of school feeding programs on child development and household decision-

making.

Third, we contribute to the literature on the shadow education system which is private, fee based tutoring that supplements formal schooling. Participation in shadow education has been shown to be highly stratified by socioeconomic status, with wealthier families better able to afford and access these services (Bray, 2009). Educationally, shadow education has been associated with short-term gains in test performance, but its effects on long-term learning, conceptual understanding, and critical thinking are mixed (Bray, 2009; Jayachandran, 2014). We contribute to this literature by examining how the midday meal program shapes the interaction between formal schooling and shadow education, including potential substitution effects.

Fourth, we contribute to the literature on school choice and the broader impacts of school feeding programs on the learning environment (Adekunle and Christiana, 2016; Abotsi, 2013). Household decisions to enrol children in public versus private schools are influenced by a range of factors, including family income, perceived school quality, parental education, and the availability of benefit programs. We add to this literature by examining how access to school meals affects school choice. In addition, our findings speak to the growing body of research on the role of the learning environment in shaping educational outcomes and its key determinants (Samdal et al., 1998; Finnan et al., 2003). Specifically, we analyze how the introduction of the midday meal program influences students' perceptions of teacher behavior and parental confidence in schools.

We have a number of interesting findings from this study. Our analysis reveals that exposure to the midday meal program leads to a significant reallocation of parental educational investment, without any perceptible impact on overall education expenditure. Specifically, we find that children exposed to the midday meal program experience a statistically significant 0.047 standard deviation reduction in school fees, which can be attributed to an increase in enrolment in government schools by 0.38 percentage points. Expenditures on books, uniforms, and transport remain unaffected. The increase in enrolment in government schools plausibly resulting from a transfer from private schools is, however, associated with a deterioration in the learning environment, as children report worse teacher quality, and parents express reduced confidence in schools. To offset perceived deficiencies in

government school instruction, parents adopt a compensatory strategy such that children exposed to the midday meal program see a 0.234 standard deviation increase in private tuition expenditures. Heterogeneity analyses further show that the decline in school fees and the increase in private tuition fees is more pronounced among older children, with no evidence of gender-based disparities.

The rest of the paper is organized as follows. Section 2 provides a brief overview of the midday meal program. In Section 3, we discuss the data sources and our relevant study sample. We then present the methodology and identification strategy in Section 4. Section 5 describes the main results and findings of our study. Section 6 performs robustness checks for our main results and Section 7 provides the results from heterogeneity analyses. Finally, Section 8 concludes.

2 Midday Meal Program

The midday meal program in India is the largest school feeding program in the world, feeding about 115 million children every school day (Tibrewala, 2021). In 1995, though the central government of India mandated the provision of free school meals to all children in public primary schools via the National Program of Nutritional Support to Primary Education, the compliance rates among the states were very poor. A few years later, in 2001, seven districts in the country were hit by severe droughts leading to many deaths due to starvation. The People's Union for Civil Liberties (PUCL) then filed a case against the Government of India arguing that the stock of food grains in the country was much more than the storage capacity, and that there was a need for expansion of the different statutory food and nutrition programs including the mid day meal scheme in schools. Finally, the Supreme Court of India issued an interim order on November 28, 2001 stating that "Every child in every government and government-assisted school should be given a prepared mid day meal".[1] Nevertheless, in spite of the Supreme Court order, the midday meal program was implemented in a staggered manner across different states over the next five years, and by 2006 all students in primary government and government-aided schools in all states became recipients of the midday meal

[1]Supreme Court Order of November 28, 2001, Record of Proceedings Writ Petition (Civil No). 196 of 2001

scheme. The midday meal guidelines specified that each student should receive 100 grams of wheat or rice, 20 grams of pulses, 50 grams of vegetables and 5 grams of fat per day for a total calorie intake of 300 kilo calories (Department of School Education & Literacy, Ministry of Education, Government of India, 2025). In 2009, the total cost of providing the meal was Rs 2.90 (approximately US$ 0.032) per child per day, which was inclusive of the cooking costs, and the cost of labor and management. Of the total costs, about 75 percent was borne by the central government while the residual 25 percent was borne by the state government.

3 Data

We use data from the nationally representative Indian Human Development Survey (IHDS), a unique panel survey that interviewed around 42,152 households across 1,420 villages and 1,042 urban neighborhoods in India in the years 2005-06 and 2011-12. IHDS covers a range of topics such as income, agriculture, consumption, employment, education and health among others. We use data from the 2005-06 round of IHDS, primarily focusing on outcomes concerning education.

There are several advantages of using the IHDS data for our study. First, unlike most other survey data that have household level information, the IHDS data has child level information on the investments made by parents in educational inputs such as school fees, books, stationery, uniform, school transport, and private tuitions. This allows us to answer our main research question of how parents alter their investment decisions regarding their children's education in response to the program. Second, the first round of IHDS was conducted in 2005-06, before the midday meal program was implemented in all states. This allows us to exploit the variation in exposure to the midday meal scheme across cohorts in different states and also have a pure comparison group that includes eligible children in states who were not exposed to the midday meal program till then. Finally, the study collected comprehensive individual level information such as education level, parents' education level, type of school as well as household level information on several observable characteristics such as consumption expenditure, income, caste and residence of the household (rural/urban) among others.

Table A2 provides provides summary statistics of key demographic character-

istics of our sample and mean expenditure on educational inputs. The average age of children in our sample is 11 years, with 46.2% being female, 82% being Hindu, about 29% living in urban areas. In line with Wang and Cheng (2022), we standardize educational expenditure with respect to the mean and standard deviation. Our main dependent variables are the standardized values of the amount of educational expenditure in (i) school fees (ii) books, uniform, and transport, and (iii) private tutoring.

We referred to Chakraborty and Jayaraman (2019) to obtain the state wise implementation timeline of the midday meal program. Using the timeline of implementation they provide, we obtained the number of years of potential exposure for each child covered in the IHDS survey, varying by his/her standard and state of residence. [2]. While Chakraborty and Jayaraman (2019) did not have implementation information for the state of Goa, we referred to Government of Goa (2010) for this information and added the state to our analysis. Additionally, we do not have information on when the mid day meal scheme was introduced in Jharkhand and Nagaland, and hence we opt these two states out of our analysis. For more details about program implementation, refer to Appendix Table A1.

4 Empirical Methodology

The main objective of the study is to determine the causal impact of exposure to the mid day meal program on parental investment in their child's education related expenditures. We will look at the Intention-to-Treat estimates, where a child is defined as "treated" if he/she is in the relevant primary school grade to receive the midday meal in a state that has implemented the program, irrespective of the type of school that he/she attends. The rationale behind defining treatment in this manner is that we suspect parents might transfer their children to government schools since they would want their children to be a recipient of the program.

We define exposure to the midday meal program both at the extensive and intensive margin. Exposure at the intensive margin is defined as the number of years that the individual was exposed to the program based on his/her grade and

[2]We dropped the states of Kerala, Gujarat, Puducherry, and Tamil Nadu from our analysis since they implemented the mid day meal scheme before the Supreme Court of India mandate

the state that he/she belongs to (Refer to Table 1 for more details on how exposure is defined at the intensive margin). On the other hand, exposure at the extensive margin is a binary variable that takes a value of 1 if the individual was exposed to the program for at least a year, and 0 otherwise. For our main results, we use the definition of exposure at the extensive margin, but we will show that the results are similar even when we define exposure at the intensive margin.

Our sample consists of children who are currently attending government or private schools[3] and are between 6 to 17 years of age, with the main unit of analysis being an individual child.

We use the following econometric specification to examine the causal impact of exposure to the program on parental investment in education related expenditures:

$$\mathrm{Y_{igs}} = \beta_0 + \beta_1 \mathrm{MDM_{igs}} + \beta_2 \mathrm{X_{igs}} + \phi_{\mathrm{g}} + \gamma_s + \epsilon_{\epsilon_{igs}} \tag{1}$$

where $\mathrm{Y_{igs}}$ denotes the amount of educational expenditure for child i in standard g in state s; $\mathrm{MDM_{igs}}$ is a dummy variable that takes a value of 1 if child 'i' in standard 'g' in state 's' was exposed to the midday meal program for at least one year, and 0 otherwise; $\mathrm{X_{igs}}$ includes control variables such as age, number of children in household, mother's education in years, income per capita, religion, and binary variables for female, household head's child, and urban residence, ; ϕ_g denotes standard fixed effects; and γ_s denotes state fixed effects. Standard errors are clustered at the state level and survey weights are used. Our main dependent variables are the standardized values of the amount of educational expenditure in (i) school fees (ii) books, uniform, and transport, (iii) private tutoring, and our main coefficient of interest is α_1.

Our treatment variable $\mathrm{MDM_{igs}}$ varies at the state and standard level, i.e. whether or not a child is exposed to the program depends on his/her state of residence and the standard the child was in during the 2005-06 IHDS survey. Since treatment depends on both state and standard, we introduce state and standard

[3]Government and private schools together account for 91% of the school going sample. Children attending junior colleges, vocational training institutes, madrasah, convent schools comprising 4.48% of the sample are dropped from the analysis as these institutes are unlikely to be substitutes for government and private schools. Further, 4.9% of the sample attends Government-aided and EGS schools that are also dropped as information on midday meal implementation is not available

Table 1: Years of Exposure by Grade and Year of Implementation

Grade in 2005	Year of Implementation			
	2002	2003	2004	2005
1	0	0	0	0
2	1	1	1	0
3	2	2	1	0
4	3	2	1	0
5	3	2	1	0
6	2	1	0	0
7	1	0	0	0
$\geq$8	0	0	0	0

Notes: The states of Jammu & Kashmir, Bihar, Assam, and West Bengal implemented the mid day meal program in 2005. Therefore, children in these states were exposed to the mid day meal program for less than a year when the survey was conducted. The mid day meal program was not implemented in the states of Chandigarh, Delhi, Mizoram, and Goa by 2005.

fixed effects in our model to ensure that we account for any time invariant unobserved characteristic of states and different standards.

We argue that given the state-wise staggered implementation of the program for specific cohorts, access to this program was plausibly exogenous for households. In order to alleviate the concern that households may have relocated to states where the program was implemented in order to gain access to the program, we show that our results are robust to excluding those from our sample who have been living in their current place of residence for less than 3 years.

5 Results

We begin the discussion with our main results in Table 2. Using the specification in equation 1, we examine the impact of exposure to midday meal for at least one year on parental investments in educational inputs such as school fees, books, uniform, transport, private tutoring and the total educational expenditure. In column (1), we consider the standardized school fees as an outcome variable and the results show that exposure to the midday meal for at least a year is associated with a

0.047 SD decline in school fees. In column (2), we consider other educational expenses such as books, uniform, transport etc and the results show that there was no significant change in these expenses with exposure to the midday meal. In column (3), we find that exposure to the midday meal is associated with a 0.23 SD increase in expenses on private tutoring. Finally, in column (4), we find no significant change in the total educational expenditure. Overall, the results in Table 2 indicate that there was a significant change in the pattern of educational spending by parents in response to the midday meal program. While the spending on school fees declined, the spending on private tutoring increased. Further, given that the total spending on educational inputs did not change, it appears that parents responded to the program by reallocating expenses between educational inputs rather than an overall change in the educational expenditure.

We then explore the observed decline in school fees by examining the possibility that a child's enrollment may shift to a different school type in response to the program. In general, in India, the school fees for government schools is significantly lower compared to private schools. In our sample, the average school fees for children going to government schools was Rs. 125 and the average school fees for children going to private schools was Rs. 1521 for the last year. We hypothesize that parents moved their children to government schools in response to the midday meal program so that their children could benefit from the free meals being provided. In order to explore this possibility, we run a logit regression on school choice. The outcome variable in this regression is choosing a government school as opposed to a private school. The results in Table 3 indicate that there was a positive and significant association between exposure to the midday meal program and enrolment in a government school as opposed to private school. This result provides some evidence to support our hypothesis that parents were more likely to enrol their children in government schools as opposed to private schools in response to the program.

The choice between a government and private school in India is an important one with substantial implications on student learning. Several research papers show that private schools in India have better learning outcomes than government schools (Kingdon, 1996; Singh and Sarkar, 2015). We observe an increase in government school enrolment; however this does not translate to improved learning

outcomes for children with no change in math, reading and writing scores (results available upon request). There may be multiple factors impacting learning outcomes in this scenario. While on the one hand, increased government school enrolment may have worsened learning outcomes for children overall, on the other hand, access to free meals may have increased the nutritional intake of children, and hence their cognitive abilities and consequently, their learning outcomes. In our context, the relatively short time period in conjunction with these opposing forces may have accounted for the absence of any observed change in learning outcomes.[4]

Further, we explore some other outcomes pertaining to the learning experience of children and parents' confidence in schools. First, we examine a variable which informs children's feedback on how their teachers treat them—"How did the teacher treat you?", where the responses are on a scale of 1 to 3— with higher values representing worse treatment from the teachers. We consider this variable as the outcome variable in Table 4, column (1). The results show that exposure to the midday meal program is associated with children receiving poorer treatment from teachers. We also consider an outcome variable relating to the parents' perception of schools—"How much confidence do you have in schools to provide a good education?" The responses are on a scale of 1 to 3 with higher levels representing more confidence [5]. The results presented in column (2) of Table 4 show that exposure to the program was associated with lower levels of confidence in schools. Overall, the results in the table highlight a deterioration in the learning environment, with children reporting worse teacher quality and parents reporting lower confidence in schools.

Overall, the results show that parents increased enrollment of children in government schools to benefit from the midday meal program, and given the lower quality of education in government schools, children reported worse teacher feedback and parents reported lower confidence in schools to provide quality education. In order to compensate for the decline in learning, parents increased their expendi-

[4]Chakraborty and Jayaraman (2019) find that prolonged exposure to the midday meal program improved math and reading test scores.

[5]The original data was on the scale of 1 to 3, where higher levels represented lower confidence. For ease of interpretation, we rescaled the data such that higher levels represented higher levels of confidence

ture on private tutoring. The reallocation of resources from school fees to private tutoring was done in a way such that the overall expenditure on education was unaffected.

Table 2: Impact on Educational Expenditure

	School Fees	Books, Uniform, Transport	Private Tuition	Total
	(1)	(2)	(3)	(4)
Midday Meal	-0.047**	0.044	0.235*	0.083
	(0.017)	(0.050)	(0.135)	(0.071)
Observations	24,537	24,537	24,537	24,537
R-Squared	0.276	0.315	0.207	0.388
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Note: The dependent variables in the above table are standardized relative to overall sample mean and standard deviation. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

6 Robustness Checks

In this section, we present findings from several robustness checks that we conduct on our results.

6.1 Intensive Margin

To begin with, we test the robustness of our results to an alternative treatment definition. In the analysis so far, treatment has been defined as a binary variable that takes unity if the child was exposed to midday meal for at least a year, and zero otherwise. Since there was state wise variation in the implementation of the program, there were differences in years of exposure across cohorts. The year in which the program was first implemented in any state was 2002 and the

Table 3: Impact on School Choice: Logit Regression

	Enrolled in Government School
	(1)
Midday Meal	0.370**
	(0.145)
Observations	24,536
Pseudo R-Squared	0.2646
Control vars	Yes
Standard FE	Yes
State FE	Yes

Note: The outcome variable takes a value of 1 if the child was enrolled in a government school, and 0 otherwise. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

Table 4: Impact on Learning Experience

	Negative Teacher Feedback	Confidence in Schools
	(1)	(2)
Midday Meal	0.053*	-0.040*
	(0.029)	(0.023)
Observations	7,384	24,414
R-Squared	0.147	0.060
Control vars	Yes	Yes
Standard FE	Yes	Yes
State FE	Yes	Yes

Note: Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

IHDS-I survey was conducted in 2005. Thus, the number of years of exposure could vary from 0 to 3. We consider defining treatment at the intensive margin by including three binary variables as treatment variables—one for each year of exposure. The results are presented in Table A3. In column (1), we find that with each subsequent year of exposure, school fees declines to a larger extent. Similarly, for each subsequent year of exposure to the program, private tutoring increases to a larger extent.

6.2 Inter-state Migration

Since we are exploiting state wise variation in the implementation of the midday meal program, inter-state migration might have a confounding effect and bias our impact estimates. In order to address this concern, we restrict our analysis to households who have lived in the current place of residence for at least three years. We chose to restrict by three years since the maximum possible exposure to the program is three years. As seen from Table A4, the expenditure on school fees reduces by 0.04 SD and the expenditure on private tutoring increases by 0.24 SD,

which are similar to the point estimates that we obtained from the full sample. Therefore, we can rule out the possibility of contamination of treatment due to inter-state migration.

6.3 Clustering at District Level

In the analysis presented thus far, we have clustered standard errors at the state level, given that the program was implemented at the state level. To assess the robustness of our findings, we perform a sensitivity check by clustering standard errors at the district level, as shown in Table A5. The results remain qualitatively similar, although the p-values are slightly higher, indicating that the statistical significance is somewhat reduced when considering the more granular district-level variation. This suggests that our initial state-level clustering does not introduce substantial bias, and the key findings hold across different levels of aggregation."

7 Heterogeneity

In this section, we present heterogeneity results by age and gender. First, we consider heterogeneity by age, where we consider the results separately for those aged 12 years and below and those above 12 years. The results are presented in Table 5. Here, we present results for only school fees and private tutoring as these are the variables responding to the midday meal program. The results show that for both school fees and private tutoring, the results are driven by older children—those aged above 12 years. It is plausible that the results hold for older children as their nutritional requirements are higher than younger kids, and hence parents were more likely to ensure that their older children receive the benefit of the midday meal. In addition, parents may be more concerned about learning outcomes for older children as their test scores will determine future admissions in higher educational institutes or future employment. For both school fees and private tutoring, a t-test of the difference between those aged 12 years and below and above 12 years is statistically significant with p-values of 0.052 and 0.011 respectively.

Next, we present heterogeneity by gender. In Table 6, the results show that

Table 5: Heterogeneity by Age

Age	School Fees		Pvt. Tuition	
	12 years and below	Above 12 years	12 years and below	Above 12 years
	(1)	(2)	(3)	(4)
Midday Meal	0.010	-0.103*	0.001	0.414**
	(0.015)	(0.055)	(0.033)	(0.187)
Observations	16,790	7,747	16,790	7,747
R-Squared	0.282	0.262	0.149	0.250
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Note: The dependent variables in this table include standardized variables for educational expenditures. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

there is a decline in school fees for both males and females with the decline being larger for females. Further, for private tutoring, there is a positive and significant relationship between exposure to midday meal for males whereas the relationship is not significant for females. While there is some heterogeneity in the results, especially for private tutoring, t-tests for difference between genders are not rejected with p-value for school fees being 0.2683 and p-value for private tutoring being 0.6529.

8 Conclusion

This paper contributes to the literature on public transfer programs and household investment behavior by examining the impact of India's midday meal scheme on parental educational expenditure. Using nationally representative data from the Indian Human Development Survey and leveraging the staggered roll out of the midday meal program across states, we present causal evidence on how in-kind transfers impact private educational choices.

Table 6: Heterogeneity by Gender

	School Fees		Pvt. Tuition	
	Female	Male	Female	Male
	(1)	(2)	(3)	(4)
Midday Meal	-0.059**	-0.035*	0.250	0.230*
	(0.021)	(0.019)	(0.152)	(0.125)
Observations	11,347	13,190	11,347	13,190
R-Squared	0.285	0.274	0.200	0.218
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

Note: The dependent variables in this table include standardized variables for educational expenditures. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

Our findings suggest that the midday meal program led to a reduction in school fees, primarily due to increased enrolment in government schools. However, this shift to government schools resulted in a deterioration of the perceived learning environment, as children reported poorer treatment by teachers and parents expressed lower confidence in the schools. In response to the perceived decline in educational quality, households increased their investment in private tutoring, aiming to compensate for the worse learning conditions. Despite these adjustments, total educational expenditure remained unchanged, indicating that the decline in school fees was offset by the increase in private tutoring costs. This suggests that there was no crowding in or crowding out of overall educational investment, but rather a reallocation of spending within the household.

Taken together, our study highlights the complex and sometimes unintended behavioral responses of households to public in-kind transfers. While programs like the midday meal can reduce financial barriers to schooling, their long-run effectiveness may be limited without complementary investments in school quality. Future research should explore the interaction between demand-side incentives

and supply-side improvements to fully realize the human capital benefits of such interventions.

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A1 Appendix

Table A1: State wise Implementation of Midday Meal Program

State	Implementation	
	Month	Year
Andhra Pradesh	January	2003
Arunachal Pradesh	July	2004
Assam	January	2005
Bihar	January	2005
Chhattisgarh	April	2002
Dadra & Nagar Haveli	February	2002
Daman & Diu	June	2003
Haryana	August	2004
Himachal Pradesh	September	2004
Jammu & Kashmir	April	2005
Karnataka	July	2003
Madhya Pradesh	January	2004
Maharashtra	January	2003
Manipur	November	2004
Meghalaya	January	2003
Mizoram	February	2006
Orissa	September	2004
Punjab	September	2004
Rajasthan	July	2002
Sikkim	October	2002
Tripura	April	2003
Uttar Pradesh	September	2004
Uttaranchal	July	2003
West Bengal	March	2005

Source: Chakraborty and Jayaraman (2019)

Table A2: Summary Statistics

Variable	Mean	Std. Dev.
Demographic Characteristics:		
Age of child (in years)	10.824	3.077
Female (proportion)	.462	.499
Household head's child (proportion)	.804	.397
Hindu (proportion)	.816	.388
Muslim (proportion)	.113	.316
Christian (proportion)	.013	.115
Sikh (proportion)	.040	.197
Other religion (proportion)	.018	.133
Urban (proportion)	.289	.453
Number of children	2.814	1.362
Mother's education (yrs)	3.518	4.316
Income per capita (Rs.)	8612.644	12057.63
Educational Inputs:		
School fees (Rs.)	590.647	1446.608
Books, uniform, transport etc (Rs.)	806.649	1165.518
Private tutoring (Rs.)	260.354	916.984
N	24,537	

Note: The expenses on educational inputs are all measured over the past one year.

Table A3: Robustness check: Intensive margin

	School fees (Std.)	Books, Uniform, Transport (Std.)	Private tuition (Std.)	Total (std.)
	(1)	(2)	(3)	(4)
Midday meal 1 year	-0.044**	0.046	0.218	0.082
	(0.016)	(0.049)	(0.129)	(0.068)
Midday meal 2 years	-0.061**	0.034	0.286*	0.091
	(0.026)	(0.061)	(0.145)	(0.080)
Midday meal 3 years	-0.094**	0.058	0.309*	0.090
	(0.036)	(0.071)	(0.161)	(0.098)
Observations	24,537	24,537	24,537	24,537
R-Squared	0.276	0.315	0.208	0.388
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

The dependent variables in this table include standardized variables for educational expenditures. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

Table A4: Robustness check: Removing potential migrants

	School fees (Std.)	Books, Uniform, Transport (Std.)	Private tuition (Std.)	Total (std.)
	(1)	(2)	(3)	(4)
Midday meal	-0.041**	0.050	0.238*	0.092
	(0.017)	(0.049)	(0.135)	(0.069)
Observations	24,002	24,002	24,002	24,002
R-Squared	0.273	0.314	0.206	0.386
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

The dependent variables in this table include standardized variables for educational expenditures. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the state. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.

Table A5: Robustness check: Clustering at district level

	School fees (Std.)	Books, Uniform, Transport (Std.)	Private tuition (Std.)	Total (std.)
	(1)	(2)	(3)	(4)
Midday meal	-0.047***	0.044	0.235***	0.083
	(0.016)	(0.029)	(0.059)	(0.071)
Observations	24,537	24,537	24,537	24,537
R-Squared	0.276	0.315	0.207	0.388
Control vars	Yes	Yes	Yes	Yes
Standard FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes

The dependent variables in this table include standardized variables for educational expenditures. Controls include age, gender, household head's child, urban dummy, number of children, mother's education, income per capita and dummies for hindu, muslim, christian and sikh religions. In addition, the model consists of state and standard fixed effects. Survey weights have been added. Standard errors are clustered at the level of the district. Statistical significance at 1, 5, and 10 percent levels are denoted by ***, **, and *, respectively.