Role of Parental Education in Schooling and Child Labour Decision: Urban India in the Last Decade

Diganta Mukherjee · Saswati Das

Abstract This paper uses household level data from National Sample Survey Organization (NSSO) of India, the 55th (1999–2000) and the 61st (2004–05) rounds, to show that even with a significant wage incentive for schooling of urban children, the school drop out rate and child labour incidence are not small over this period. The parents' level of education plays an important role in reducing this tendency; thus establishing the linkage between social and human capital outcomes in the family. We also look at the incidence of harmful and manual occupations among the child labour. Mother's education appears as the more important factor in the recent round in curbing the manual work incidences; supporting earlier findings that women's empowerment (one important indicator of which would be female educational level) is indeed becoming instrumental in increasing parental awareness. Using a pooled data set, we have also analysed the changes in the impact of parental education on these decisions between 1999–2000 and 2004–05.

1 Introduction

Childhood is a period of life to be devoted to education and training. Work done by children often jeopardizes their chances of becoming productive adults. In many places, including India, Pakistan, Bangladesh, Ghana and other countries, incidence of child labour outside the family is either rising or is significant and decreasing very slowly. This reflects a shift in attitude towards child labour itself. Initially seen mainly as a tool enabling the

D. Mukherjee (✉)
ICFAI Business School Kolkata, Plot J-3, Block GP, Sector V, Salt Lake City,
Kolkata 700 091, India
e-mail: digantam@hotmail.com

S. Das
Indian Statistical Institute, Kolkata, India

child to become socialized and acquire skills that will be useful to him or her in the future, it is now increasingly often seen by families as a means of supplementing their income.[1]

School dropout and child labour are major problems for the modern day society, particularly in the developing countries. Poverty forces many children to work full time for their own and their families' survival. But one can also have a situation where children live in communities that do not have adequate school facilities, so they work. In fact, many schools serving the poor are of such abysmal quality, or chances of improved upward mobility for graduates are so slim, that the expected return is not equal to the sacrifice made. The literature is replete with testimony of families that would like to educate their children, but either cannot do so, or do not feel that the inferior schools available to them merit the costs. While it is true that many children drop out of school because they have to work, it is equally true that many become so discouraged by school (because of the inferior quality of education provided) that they prefer to work (Ray 2000a and The Probe Team 1999). These problems mean that only 68 per cent of the world's children until age 11 complete primary education (International Labor Organization 1996). There are several empirical studies on this. See Heady (2000), a quantitative survey for Bangladesh, focussing on the slum population of Dhaka city (Delap 1998) and Grootaert and Patrinos (1998). Ray (2000a 2000b) found similar evidence for Ghana and Peru.

The striking fact that its not only poverty that drives children from school to the child labour market is also illustrated by the National Sample Survey (NSS) reports showing that among the school dropouts roughly 25 percent were not in school because they were not interested. Among those employed in the child labour market, particularly for urban boys, a large proportion (≈ 10 %) was working not because they had to, but to acquire skill or spend time.

Bourdieu (1986) introduced social capital and cultural capital to complement economic capital, which consists of financial, physical and natural capital. He describes social capital as the actual or potential resources residing in one as a result of the investment in social relations over the years, both conscious and unintended, of the individual and its family. Cultural capital on the other hand would encompass human capital (skill formation) and education, culture as well as early socialization. Both the social and cultural capital of a child's family is important, albeit often disguised determinants of the returns to investment in education. They shape a young child's cognitive and social development, and will influence the decisions of a child's parents regarding length and quality of its education (Janssens et al. 2004).

Loury (1977 1981) was one of the pioneer authors to introduce social capital into the economics of education. He shows how differences in socioeconomic background (through social stratification, racial segregation in neighborhoods, differences in parental education and income) determine the eventual education that an individual will receive. Individuals with otherwise equal initial abilities but living in different social contexts can end up choosing entirely different educational careers. Coleman (1988) popularized the concept of social capital with its role in the creation of human capital. He emphasizes the importance of relations (in the sense of regular interaction and a cordial relationship) between the parents and the child for child outcomes. Heltberg and Johannesen (2002) found that education of the parents, especially that of the mother had a strong impact on human capital outcomes. See also Janssens et al. (2004).

---

[1] This is discussed in more detail in the excellent survey on the determinants of child labour by Brown et. al. (2002) and the references cited therein. See also Das and Mukherjee (2007), henceforth referred to as **DM**.

The aim of this paper is to explore this linkage between parental human capital and children outcomes (in terms of extent of schooling, tendency to drop out and decision to work as child labour). In particular, we focus on urban children as the labour market opportunities are more diverse and may require a wider set of skills from them than from children in the rural sectors. Even though poverty is likely to be a major driving force towards school dropout and child labour, we want to check if parental education and occupation structure (kind of job, manual or skilled, or nature of job contract) has any significant role to play. The analysis is done separately for the male and female children to highlight possible gender differences. We do this in two stages. In the first stage, we analyse the linkages separately for the two time periods 1999–2000 and 2004–05. Secondly we pool the two data sets and explore the changes over the two time periods.

The rest of the paper is organized as follows. Section 2 formulates the alternative hypotheses to be tested in our context. The data and methodology is described in Sect. 3 and the results are presented in Sect. 4. Finally, Sect. 5 concludes with a discussion of some policy issues.

2 The Statistical Hypotheses to be Tested

Based on our above discussion, it is relevant to check whether parental level of education is important in determining the dropout or schooling decision for the child. Prior to this, we should also check whether formal education actually helps in the job market or not. This is done in **DM** who provide strong evidence for such a linkage in the adult and child labour market.

We now come to the primary question of the paper; that of the role of parental education in dropout or work decisions for the child. In the first stage of our analysis, the relevant hypotheses are:

H_{1A} parental education levels do not influence dropout decision for the child.

H_{1B} parental education levels do not influence the decision to employ the child in the labour market.

Secondly, for the incidence of manual and harmful child labour, we formulate the following hypotheses:

H_{2A} parental education levels do not influence the decision to employ the child in manual work.

H_{2B} parental education levels do not influence the decision to employ the child in harmful work.

These are tested separately for the two time periods considered. The second stage analysis focuses on the change of the effect of parental education on the child labour or drop out decision. To do that we will use a pooled data set and dummy variable technique to test the following hypothesis:

H_{3A} there is no change in the influence of parental education levels on dropout decision for the child.

H_{3B} there is no change in the influence of parental education levels on the decision to employ the child in the labour market.

H$_{4B}$ there is no change in the influence of parental education levels on the decision to
         employ the child in manual work.

H$_{4B}$ there is no change in the influence of parental education levels on the decision to
         employ the child in harmful work.

   We formulate the relevant regression equations in Sect. 3 and the results are discussed
in Sect. 4.

3 Data and Methodology

The present study focuses on urban male children, as the incentives for education would be
stronger for the urban male in the recent years when the workforce is being progressively
introduced to new products, skills and opportunities.

   As mentioned earlier we use the household level data collected and made available by
National Sample Survey Organization (NSSO) for the large sample rounds 55th and 61st
conducted during 1999–2000 and 2004–05 on employment and unemployment situation in
India. Some important concepts and definitions followed in this study are described below.

   The sample: One salient feature of the 1999–2000 survey was that the *rotation-sampling
scheme* was adopted. The survey period was divided into four sub-rounds, each with a
duration of three months. Under *rotation sampling scheme*, 50 per cent of the sample first
stage units (fsus) of each sub-round was revisited in the subsequent sub-round. fsu's are
urban frame survey blocks for the urban sector. The ultimate stage units are households at
the subsequent stage. A sample of 10,400 fsus (rural and urban combined) were surveyed at
all-India level during the survey period. Out of 10,400 fsus, a total of 3,900 fsus (1,300
each from sub-rounds 1, 2 and 3) were revisited in the subsequent quarters. NSSO makes
available both types of data file, one, including the fsus visited only once during the period
and another type including the revisited fsus also. In the present analysis only first type of
data files were used to avoid the repetition.

   The seventh quinquennial survey on employment and unemployment was conducted in
the 61st round of NSS during July, 2004 to June, 2005. As usual, the survey period of this
round was divided into four sub-rounds, each with a duration of three months. An equal
number of sample villages/blocks (fsus) were allotted for survey in each of these four sub-
rounds. At the all-India level, a total number of 12,788 fsus (8,128 villages and 4,660 urban
blocks) was allocated for the survey. The ultimate stage units are households at the sub-
sequent stage.

   Activity status: In both the surveys, NSSO used three approaches for classification of the
activity statuses of the person surveyed. These are:

(i)   number of persons usually employed—usually employed in the principal status and all
       workers taking into account the employed according to both the principal and
       subsidiary statuses,
(ii)   the average number of persons employed in a week based on the current weekly
       status and
(iii) The average number of persons–days employed per day.

   Of the three approaches, the usual principal status approach is best suited as a measure
of the economic activity in an economy with seasonal fluctuations in the employment. This
is because, in this approach the criteria used is the pattern of activities followed by the
person for a relatively long period of time (NSSO 2001). In our present study we

considered only those urban male and female children *usually employed in the principal status* and termed them as labourers.

Household size: According to NSS (NSSO 2001) the number of normally resident members of a household is its size. It will include temporary stay-away but exclude temporary visitors and guests. In deciding the composition of a household, more emphasis is placed on 'normally living together' than on 'ordinarily taking food from a common kitchen'.

Father's/mother's education: Adult education has been categorized as below:

(a) not literate 0;
(b) literate but below primary 1;
(c) primary and middle 2;
(d) secondary 3;
(e) higher secondary 4;
(f) graduate and above 5.

Informal enterprises: All enterprises with type of ownership as either 'proprietary' and 'partnership' have been treated by NSS (NSSO 2001) as informal enterprises in the present survey.

Father's occupation: Only two categories of occupation have been considered. One category represents those who work in household enterprise (self employed) or own account worker, employer or work as regular salaried/wage employee. An own account enterprise is an undertaking run by household labour, usually without any hired worker employed on a 'fairly regular basis'. By 'fairly regular basis' it is meant that the major part of the period of operation(s) of the enterprise during the last 365 days (NSS), 2001). Another category is if other than these specified cases.

Child education: Child education has been categorized as below,

(a) not literate 0;
(b) literate but below primary 1;
(c) primary 2;
(d) above primary 3.

Dropout: Dropout child has been defined as who ever attended but discontinued studies to supplement household income or other reasons; or dropped out for similar reasons.

Child labour incidence: In NSS data relationships between family members can only be identified using the information regarding 'relation to head'. Due to incomplete information child labour incidence for only following two cases could be considered: (1) head of the household is father with living spouse; and (2) head of the household is grand father with only one son or one daughter with his or her spouse alive. As a result only 435 (out of 617) observations having child labour incidence and 20,920 (out of 25,183) observations having no such incidence could be considered for boys in the 55th round in the present analysis. The corresponding figures for the 61st round are 374 (out of 495) and 18,241 (out of 22,106). Similar data loss has also occurred for the girls. It is worth mentioning here that filtering through these conditions not only reduces the sample size but may bias our results also. The family composition may be related to child labour decision.

Manual Work: According to National Classification of Occupations 1968 (NSSO 2001), manual work is a work which essentially involves physical operations. However, jobs essentially involving physical labour but also requiring a certain level of general, professional, scientific or technical education is not to be termed as manual work. On the other hand, jobs not involving much of manual labour but at the same time nor requiring much

educational background either are to be treated as manual work. Thus, engineers, doctors, dentists, midwives etc. are not considered as manual workers even though their jobs involve some amount of physical labour. But peons, chowkidars, watchmen etc. are considered as manual workers even though their work may not involve much physical labour.

*Harmful work:*The identification of harmful work was due to the list of state prohibited occupations prepared by the New York State Department of Labour. Effort was to make a one to one matching of this listed occupations with those of 5-digit National Industrial Classifications 2004, prepared by the Central Statistical Organization of India, though in few cases some subjective decisions were unavoidable.

Other variables: Other variables used in our analysis are average monthly per capita expenditure as proxy for per capita income and dummies for caste (general and scheduled) and religion (Hindu and Islam).

3.1 Model Specification

We now discuss the testing of hypotheses H_{1A} and H_{1B}. For the binary dependent variables drop out and child labour incidence, we use the following probit model:

$$P(Y_i = 1) = \alpha + \beta_1 \text{hhsize} + \beta_2 \text{MPCE} + \gamma_1 GC + \gamma_2 SC + \gamma_3 \text{Hindu} + \gamma_4 \text{Islam}$$
$$+ \delta_1 \text{fgedu} + \delta_2 \text{mgedu} + \delta_3 \text{focu} + \varepsilon \tag{1}$$

where, hhsize = household size; MPCE = average monthly per capita expenditure; GC = indicator or dummy variable for general caste; SC = indicator or dummy variable for schedule caste; mgedu = mother's education; focu = father's occupation; α, $\beta's, \gamma's$ and $\delta's$ are the parameters of the model and ε is the random noise term.

$Y_1 = 1$, in case of occurence of school drop out incidence; 0 otherwise.
$Y_2 = 1$ in case of occurence of child labour incidence; 0 otherwise.

This model uses observations including both child labour and child non-labour for the two rounds. Hypotheses H_{1A} and H_{1B} now become $H'_{1A}, H'_{1B} : \delta_1 = \delta_2 = 0$ for the relevant equations.

Regarding the hypotheses H_{2A} and H_{2B}, the manual and harmful child labour incidences are modeled as,

$$P(Y_i) = \alpha + \beta_1 \text{hhsize} + \beta_2 \text{MPCE} + \gamma_1 GC + \gamma_2 SC + \gamma_3 \text{Hindu} + \gamma_4 \text{Islam} + \delta_1 \text{fgedu}$$
$$+ \delta_2 \text{mgedu} + \delta_3 \text{focu} + \eta_1 \text{chwage} + \eta_2 \text{chedu} + \varepsilon \tag{2}$$

where $\eta's$ are additional parameters for two additional explanatory variables, namely, child's wage and child's education.

$Y_3 = 1$, if child occupation is manual; 0 otherwise.
$Y_4 = 1$ if child occupation is harmful; 0 otherwise.

Now the observations are restricted to the observations with child labour only, in both rounds. Hypotheses H_{2A} and H_{2B} now become $H'_{2A}, H'_{2B} : \delta_1 = \delta_2 = 0$ for the relevant equations.

For the pooled analysis, we define a new variable $D_{61} = 1$ if observation is from 61st round; 0 otherwise.

Now we use the following probit models:

$$P(Y_i = 1) = \alpha + \beta_1 \text{hhsize} + \beta_2 \text{MPCE} + \gamma_1 \text{GC} + \gamma_2 \text{SC} + \gamma_3 \text{Hindu} + \gamma_4 \text{Islam}$$
$$+ \delta_1 \text{fgedu} + \delta_2 \text{mgedu} + \delta_3 \text{focu} + D_{61} \times \beta_1 \text{hhsize} + D_{61} \times \beta_2 \text{MPCE}$$
$$+ D_{61} \times \gamma_1 \text{GC} + D_{61} \times \gamma_2 \text{SC} + D_{61} \times \gamma_3 \text{Hindu} + D_{61} \times \gamma_4 \text{Islam} + \varepsilon \qquad (3)$$

for $i = 1$, 2, 3 and 4 as defined above. The first set of parameters estimate the overall effect. The second set (with the dummy D_{61}) estimates the incremental effect for the 61st round.

The hypotheses H_{3A}, H_{3B}, H_{4A} and H_{4B} now becomes $H'_{3A}, H'_{3B}, H'_{4A}, H'_{4B} : D_{61} = 0$.

4 The Results

We start our empirical analysis by noting a few descriptive statistics as salient features of the urban child labour market in Table 1. An estimated 2.5 percent of the urban boys aged 5–14 worked as labourers in 1999–2000, in different industries in urban India against wages. The estimated number for all India urban boys was about 5.8 lac. Encouragingly, this has come down to around 2.2 percent in the 61st round (2004–05) which works out to an estimated number of 5.6 lac. Looking at the girl workers, the percentage working decreased from 1.55 in 1999–2000 to 1.21 in 2004–05. The estimated number in the population has also come down from 3.2 lac to 2.9 lac. Looking at these figures, it seems that the policies focused on reducing child labour in modern day India is more effective in case of girls than for boys.

Next we look at the education level of parents and their income (MPCE) for relevant segments of the child population in Table 2. Note that average education for the parents of children in the labour market are markedly lower than for those who are not working giving casual evidence in favour of the fact that education plays a role in child labour reduction. But as the income is lower for the families with child labour also, one needs to explore the cause and effect relationship more closely.

We have found 369 cases of manual and only 66 cases of harmful child labour incidence for the boys in 55th round. The incidence of harmful work has alarmingly gone up to 311 in the 61st round but manual work has come down to 211. The changes in the percentage incidence is also in the same direction. The corresponding figures for the girls reveal that they are less involved in harmful work. The average education levels of parents and the children are reported separately in Table 3. It is surprising to note that for the 61st round, the average education of the parents and the child is higher in case he is in a harmful

Table 1 Number of children in the age group of 5 to 14, all India urban 1999–2000 and 2004–05

Category- >	In the sample				Estimated total			
	55th round		61st round		55th round		61st round	
Count	Male	Female	Male	Female	Male	Female	Male	Female
Population	24,369	23,331	22,601	20,607	2,30,60,100	2,06,34,500	25,867,100	23,982,000
Usually employed in principal status	617	361	495	249	583421	319835	566489	290182
Percentage	2.53	1.55	2.19	1.21	2.53	1.55	2.19	1.21

Table 2 Average education and MPCE of sample households

Category	55th round				61st round			
	Male		Female		Male		Female	
Characteristic	Child worker	Child not working	Child worker	Child not working	Child worker	Child not working	Child worker	Child not working
	(435)	(20920)	(222)	(19160)	(374)	(18241)	(177)	(16827)
	(2.04%)	(97.96%)	(1.15%)	(98.85%)	(2.01%)	(97.99%)	(1.04%)	(98.96%)
Average education of father	0.816	2.354	0.847	2.287	0.647	2.338	0.842	2.251
	(1.008)	(1.645)	(1.159)	(1.636)	(0.899)	(1.645)	(1.086)	(1.627)
Average education of mother	0.299	1.661	0.365	1.611	0.307	1.681	0.345	1.626
	(0.714)	(1.606)	(0.783)	(1.574)	(0.686)	(1.574)	(0.805)	(1.570)
MPCE	439.34	706.968	437.482	685.480	468.126	834.234	468.902	798.979
	(175.780)	(469.435)	(256.360)	(583.157)	(178.751)	(904.226)	(183.676)	(1086.412)

Standard deviation in parenthesis

Table 3 Educational, economic and occupational background of sample households with child worker

Category	Characteristic	Average education of father	Average education of mother	Average education of self	MPCE	Child wage
55th round Male	Manual (369) (84.83%)	0.772 (0.993)	0.287 (0.687)	0.989 (0.984)	439.92 (176.91)	166.76 (108.91)
	Non-manual (66) (15.17%)	1.061 (1.065)	0.364 (0.853)	0.758 (0.915)	441.66 (170.59)	153.4 (70.515)
	Harmful (66) (15.17%)	0.409091 (0.722757)	0.166667 (0.543021)	0.681818 (0.862181)	435.9091 (173.2582)	213.0455 (100.8892)
	Harmless (369) (84.83%)	0.888889 (1.035307)	0.322493 (0.738358)	1.01084 (0.98626)	439.9539 (176.4532)	156.0867 (102.3448)
	Total (435) (100%)	.816 (1.008)	.299 (0.714)	.885 (.975)	439.34 (175.78)	164.73 (104.041)
55th round female	Manual (154) (69.37%)	0.681818 (0.961375)	0.331169 (0.741445)	0.935065 (1.014118)	383.1299 (147.8542)	143.8571 (89.14917)
	Non-manual (68) (30.63%)	1.220588 (1.454233)	0.441176 (0.870449)	1.029412 (0.976906)	560.5735 (380.3816)	200.6618 (54.94573)
	Total (100%)	0.846847 (1.158859	0.364865 (0.782865)	0.963964 (1.001609)	437.482 (256.3598)	161.2568 (84.29812)
61st round male	Manual (215) (57.49%)	0.637209 (0.858444)	0.283721 (0.661678)	0.981395 (0.9321)	451.271 (153.676)	224.2504 (135.8591)
	Non-manual (159) (42.51%)	0.675 (0.981271)	0.85625 (0.351938)	0.3375 (0.717153)	490.918 (206.240)	225.0469 (117.4208)
	Harmful (311) (83.15%)	0.777778 (0.905974)	0.396825 (0.730437)	1.063492 (0.931059)	488.141 (150.361)	247.5583 (119.8215)
	Harmless (63) (16.84%)	0.623794 (0.910484)	0.289389 (0.676697)	0.881029 (0.94117)	464.072 (183.918)	219.9844 (129.6652)
	Total (100%)	0.649733 (0.910344)	0.307487 (0.686209)	0.911765 (0.94072)	468.126 (178.751)	224.6292 (128.3221)
61st round female	Manual (148) (83.62%)	0.824324 (1.086192)	0.635135 (0.483027)	0.337838 (0.742803)	445.257 (142.337)	195.846 (81.113)
	Non-manual (29) (16.38%)	1.034483 (1.40109)	0.758621 (0.435494)	0.37931 (1.082781)	589.573 (296.073)	245.621 (90.981)
	Total (177) (100%)	0.858757 (1.141841)	0.344633 (0.804735)	0.960452 (0.955615)	468.902 (183.676)	204.001 (84.57796)

occupation. The wage incentive for manual and harmful work for the boys is evident from the child wage figures. Also, the parents' need to send the children to such hazardous occupations is also borne out from the MPCE figures. Only exception is for the boys in the 61st round, where the richer parents seem to prefer to send the children to harmful work.

Table 4 below presents the distribution of education level among working children in the urban sector. It is starkly evident that the drop out phenomenon is sharply increasing

Table 4 Level of education among child labour (frequency, percentage)

Education level	55th round				61st round			
	Male		Female		Male		Female	
0	182	41.84	97	43.69	163	73.42	76	34.23
1	121	27.82	56	25.23	104	46.85	40	18.02
2	99	22.76	50	22.52	87	39.19	53	23.87
3	33	7.59	19	8.56	20	9.01	8	3.60
Total	435	100	222	100	374	100	177	100

with schooling level. This is a disturbing fact, more so because there exists substantial premium for education in the labour market for both adult and child, as reported in **DM**.

In this paper we would like to explore the role of parental education in exploring and improving the child's human capital scenario in the face of a changing social pattern and economic opportunities. It is traditionally believed that father's education level plays a major role in decision making at the household level. Thus, it is expected that in case of child schooling or labour decision, father's education will be a significant explanatory variable. Also, stability of father's income should play a major role in deciding whether a child continues schooling or drops out and possibly joins the child labour market. So this is included in our set of explanatory variables. Our primary focus is on whether the mother's education level (as a proxy for her voice in household decision making) plays any role in these decisions. So, a significant coefficient of mother's education in the presence of the other variables would indicate the significance of an educated mother's role in these decisions.

4.1 Drop Out and Child Labour Incidence

Regression output presented in Tables 5–8 show patterns similar to that observed in Table 2 with respect to father and mother's education, both turning out to be significant with the intuitively expected sign. This establishes the hypothesis that mother's education, even in the presence of father's education as a predictor variable, has a significant contribution to the decisions in these respects. The effect of father's occupation is more interesting. We see that in most cases it is either insignificant or negative (significant or at least weakly significant). Only for boys in the 61st round, it shows a positive significant effect. Overall it seems that *focu* either do not influence these decisions much, over and above the effect of parental education levels, or it also has an ameliorating effect on drop out and child labour incidences. The exceptional case for the 61st round boys is surprising.

As expected, MPCE and household size has a strong impact on drop out and child labour incidence. But what is encouraging is that the education variables also have influence on these, even in the presence of MPCE as an explanatory variable. Being a scheduled caste reduces the drop out and child labour incidence in a weakly significant sense in some cases. General caste is less involved in child labour. Among the Muslims, both school drop out and child labour incidence are significantly higher.

In the second stage of our analysis we look at the results from the pooled data set using the dummy variable technique as mentioned above, to study the change of the effect of parental education on drop out and child labour incidence over the period considered.

Table 5 Drop out incidence, separate analysis for rounds

Variable	55th round				61st round			
	Male		Female		Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio
HH	-8.94E-03	-0.95568	1.07E-02	1.2413	1.25E-02	1.1872	3.87E-02	3.9128
MPCE	-2.72E-04	-3.4878	1.05E-05	0.26272	-5.99E-04	-6.1227	-2.26E-04	-2.616
GC	-2.12E-02	-0.51093	-2.07E-02	-0.5047	7.71E-02	1.5753	-6.18E-02	-1.247
SC	-6.84E-02	-1.286	7.04E-03	0.13771	0.14329	2.6754	8.06E-02	1.5592
Hindu	4.55E-02	0.61785	0.15891	2.0862	-0.10921	-1.3165	0.31534	3.0288
Islam	0.21996	2.6885	0.31189	3.7284	5.85E-02	0.63737	0.37796	3.369
FGEDU	-7.96E-02	-4.7554	-7.15E-02	-4.4632	-0.13993	-7.0178	-0.10879	-5.7463
FOCU	-6.84E-02	-1.5824	-8.64E-02	-2.0632	-3.55E-02	-0.77289	-4.00E-02	-0.88135
MGEDU	-0.10756	-5.555	-0.14351	-7.6289	-0.11747	-4.9481	-0.17506	-7.5337
Constant	-1.3991	-12.737	-1.6845	-16.321	-1.2165	-9.5121	-1.854	-13.337
No. of obs.	21355		19382		18615		17004	
Log-likelihood (0)	-2892.5		-3018.5		-2468.3		-2515.9	
Log-likelihood	-2713.1		-2846.1		-2197.3		-2265.0	
Likelihood ratio test	358.857		344.859		542.060		501.857	
Mcfadden Rsq	0.62032E-01		0.57125E-01		0.10980		0.99735E-01	

Table 6 Drop out incidence, combined analysis for rounds

Variable	Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio
HH	−1.30E-02	−1.5029	1.36E-02	1.6811
MPCE	−2.96E-04	−3.9324	1.58E-05	0.43329
GC	−2.22E-02	−0.53418	−1.90E-02	−0.46287
SC	−7.52E-02	−1.4237	1.30E-02	0.25671
Hindu	1.15E-02	0.17568	0.19091	2.7227
Islam	0.18831	2.4977	0.34188	4.3261
FGEDU	−7.98E-02	−4.7656	−7.08E-02	−4.4251
FOCU	−7.29E-02	−1.6998	−8.12E-02	−1.9516
MGEDU	−0.10793	−5.5716	−0.14233	−7.5945
DHH	3.06E-02	2.7317	2.09E-02	1.9058
DMPCE	−2.61E-04	−2.3981	−2.71E-04	−3.079
DGC	0.1011	1.5758	−4.33E-02	−0.67413
DSC	0.22611	3.0412	6.15E-02	0.85793
DHINDU	−7.53E-02	−0.90153	6.48E-02	0.74247
DISLAM	−8.76E-02	−0.8551	−2.10E-02	−0.19638
DFGEDU	−6.01E-02	−2.3112	−3.81E-02	−1.5384
DFOCU	4.19E-02	0.67058	3.66E-02	0.60193
DMGEDU	−8.23E-03	−0.2691	−3.37E-02	−1.1323
Constant	−1.3221	−15.896	−1.7457	−21.12
No. of obs.	39970		36386	
Log-likelihood (0)	−5360.9		−5535.2	
Log-likelihood	−4910.9		−5111.6	
Likelihood ratio test	899.985		847.226	
Mcfadden Rsq	0.83939E-01		0.76531E-01	

   The marginal effect of parental education found in our results for boys is quite positive. For both drop out and child labour incidence, the effect of *fgedu* has become stronger. Effect of *mgedu* has increased for the drop out case. The difference in effect in case of girls is not significant. Another positive finding for the boys is that in both decisions, the importance of MPCE has reduced. If the income impact on child labour reduces then it means education, in particular parental education, is playing a progressively major role in child labour decisions. This has important policy implications.

   We have not found any systematic gender differences in the analysis for drop out. The only difference in the analysis of child labour incidence is in the sign of *focu* which is positive (negative) for boys (girls).

4.2 Harmful and Manual Child Labour Incidence

For analysing both harmful and manual child labour incidence, child wage and child education are also used as explanatory variables. We have replaced the missing values (there are some non-reporting) for child wage by the industry specific average (according

Table 7 Child labour incidence, separate analysis

Variable	55th round				61st round			
	Male		Female		Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio
HH	−2.31E-03	−0.21135	4.00E-02	3.1697	2.22E-02	1.826	2.07E-02	1.3249
MPCE	−4.07E-04	−3.3893	−2.08E-04	−1.5588	−6.21E-04	−4.6796	−4.17E-04	−2.5038
GC	−0.13617	−2.6385	−8.68E-02	−1.2737	5.30E-02	0.90665	−0.17915	−2.3138
SC	−9.93E-02	−1.6157	8.03E-02	1.124	1.54E-02	0.23124	−0.16581	−1.9044
Hindu	0.12091	1.1331	0.25858	1.8465	5.32E-02	0.41326	0.14857	0.88522
Islam	0.36008	3.1545	0.2244	1.4765	0.33222	2.4547	0.38794	2.2038
FGEDU	−0.16774	−7.6372	−0.14034	−5.0438	−0.24991	−9.3514	−0.13225	−4.1978
FOCU	1.43E-02	0.28308	−0.15056	−2.4832	0.11921	2.1375	−9.63E-02	−1.4338
MGEDU	−0.21648	−7.3092	−0.15979	−4.3992	−0.17412	−5.1987	−0.17331	−4.2546
Constant	−1.4991	−10.096	−2.1844	−12.034	−1.593	−9.1039	−1.9154	−8.4091
No. of obs.	21355		19382		18615		17004	
Log-likelihood (0)	−2124.3		−1212.9		−1831.6		−984.09	
Log-likelihood	−1835.4		−1081.3		−1520.9		−868.79	
Likelihood ratio test	577.778		263.336		621.447		230.598	
Mcfadden Rsq	0.13599		0.10855		0.16964		0.11716	

Table 8 Child labour incidence, combined analysis for rounds

Variable	Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio
HH	−7.21E-04	−7.06E-02	3.64E-02	3.0218
MPCE	−3.92E-04	−3.4476	−2.38E-04	−1.8173
GC	−0.1354	−2.6248	−8.84E-02	−1.3005
SC	−9.61E-02	−1.5759	7.20E-02	1.0173
Hindu	0.14162	1.4875	0.20188	1.6757
Islam	0.37962	3.6207	0.17011	1.2578
FGEDU	−0.16776	−7.639	−0.1402	−5.0421
FOCU	1.56E-02	0.30873	−0.154	−2.5521
MGEDU	−0.21621	−7.3045	−0.16058	−4.4235
DHH	2.09E-02	1.516	−9.74E-03	−0.56871
DMPCE	−2.49E-04	−1.5946	−1.21E-04	−0.63437
DGC	0.18781	2.4118	−8.98E-02	−0.87177
DSC	0.10809	1.2109	−0.22941	−2.0631
DHINDU	−0.11743	−1.0279	4.34E-02	0.29685
DISLAM	−7.51E-02	−0.56188	0.30962	1.7797
DFGEDU	−8.22E-02	−2.3799	7.83E-03	0.18642
DFOCU	0.10164	1.36	6.15E-02	0.68141
DMGEDU	4.15E-02	0.92977	−1.12E-02	−0.20541
Constant	−1.5388	−13.616	−2.0842	−14.695
No. of obs.	39970		36386	
Log-likelihood (0)	−3955.9		−2197.5	
Log-likelihood	−3356.4		−1950.5	
Likelihood ratio test	1199.09		494.008	
Mcfadden Rsq	0.15156		0.11240	

to the NIC industry code). In the regression analysis for manual and harmful child labour incidence some of the explanatory variables turned out to be non-significant in both the cases. Thus we have dropped these, namely SC, Hindu, FGEDU and FOCU, from the final model presented. The results are reported in Tables 9–12.

For the manual work case, the overall fit is generally good, excepting the 55th round male children case. Household size turns out to have a weak positive effect on manual work incidence for the girls even though it is not significant for the boys. This is possibly because girls are usually assigned more household work and this incidence will be higher for larger families. MPCE has the expected negative relationship in the cases where it is (at least weakly) significant. Surprisingly, father's education was significant and had the right sign (negative) in the 55th round but it is reduced to insignificance in the 61st. On the other hand, *focu* has emerged as an ameliorating factor for manual work in the 61st round.

Another surprising find is the positive sign of the *mgedu* coefficient for the girls. Child's educational level has a positive and weakly significant coefficient in the manual occupations. This positive sign may be due to a perception of better future prospect from the child's point of view. Though this work is manual, this sector may be more productive or has a larger supply of jobs. A further support to girls working more at home, and hence in

Table 9 Manual work, separate analysis for rounds (only significant variables)

Variable	55th round				61st round			
	Male		Female		Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio	Coefficient	T-ratio
HH	9.86E-03	0.26894	4.88E-02	1.1297	1.79E-02	0.43196	0.18229	2.2227
MPCE	6.73E-05	0.13783	-2.49E-03	-3.8357	-1.18E-04	-1.7644	-2.29E-04	-1.7221
GC	0.4097	2.2332	5.78E-02	0.22122	-0.54825	-3.1109	-0.60164	-1.5809
SC	0.10337	0.46136	0.3216	1.259	-0.27983	-1.4401	-0.56269	-1.6722
Hindu	-0.26462	-0.5014	-0.11748	-0.15874	-7.91E-02	-0.1889	1.1741	1.7517
Islam	-0.59429	-1.1006	0.13325	0.16885	0.28456	0.64175	1.868	2.6958
FGEDU	-0.19744	-2.4744	-0.19908	-1.8547	1.45E-02	0.1706	-0.13805	-0.90751
FOCU	-2.04E-02	-0.11575	-0.12787	-0.56838	-0.72778	-4.3832	-0.39184	-1.3698
MGEDU	-8.62E-02	-0.75718	0.21528	1.445	-0.13041	-1.0796	0.3062	1.4428
CHEDU	0.16679	1.9226	0.19825	1.6916	0.17377	2.0592	6.62E-02	0.46372
CHWAGE	7.74E-04	0.87099	-5.69E-03	-4.1801	-1.97E-04	-0.36408	-3.60E-03	-2.3871
Constant	1.1207	1.6644	2.1735	2.6543	1.0638	2.0618	0.41895	0.46186
No. of obs.	435		222		374		177	
Log-likelihood (0)	-185.17		-136.78		-255.03		-78.940	
Log-likelihood	-176.28		-107.92		-233.95		-61.505	
Likelihood ratio test	17.7972		57.7079		42.1484		34.8689	
Mcfadden Rsq	.48055E-01		0.21096		0.82635E-01		0.22086	

Table 10 Manual work, combined analysis for rounds

Variable	Male		Female	
	Coefficient	T-ratio	Coefficient	T-ratio
HH	9.05E-03	0.2582	5.63E-02	1.3361
MPCE	5.56E-05	0.12022	−2.31E-03	−3.7609
GC	0.40804	2.2405	0.14079	0.55564
SC	0.10066	0.4551	0.29626	1.1996
Hindu	−0.28951	−0.69624	0.16149	0.2882
Islam	−0.61825	−1.4035	0.21683	0.35193
FGEDU	−0.19727	−2.4729	−0.23014	−2.2048
FOCU	−2.17E-02	−0.12365	−0.11852	−0.54096
MGEDU	−8.55E-02	−0.7536	0.18649	1.2849
CHEDU	0.16621	1.9234	0.20388	1.8032
CHWAGE	7.61E-04	0.87505	−3.91E-03	−2.7601
DHH	−3.58E-02	−0.75537	−0.1056	−1.3308
DMPCE	−6.21E-04	−1.0377	−2.38E-05	−2.60E-02
DGC	−0.97286	−3.8645	−1.0136	−2.0938
DSC	−0.39917	−1.3761	−1.0703	−2.6061
DHINDU	0.21601	0.49424	0.36628	0.53912
DISLAM	0.90749	1.8359	1.0989	1.3186
DFGEDU	0.20462	1.7548	0.16342	0.85406
DFOCU	−0.70984	−2.9572	−0.16811	−0.45847
DMGEDU	−4.21E-02	−0.25388	8.42E-02	0.31409
DHEDU	2.28E-03	1.91E-02	−0.344	−1.8265
DHWAGE	−3.95E-04	−0.37954	8.49E-03	4.0057
Constant	1.1598	2.6896	1.4603	2.4915
No. of obs.	809		399	
Log-likelihood (0)	−478.26		−221.30	
Log-likelihood	−410.14		−173.44	
Likelihood ratio test	136.227		95.7263	
Mcfadden Rsq	0.14242		0.21628	

non-wage activities, is in the negative relationship between *chwage* and manual work incidence for girls in both rounds.

The marginal analysis of the manual work case confirms the round wise findings in general, baring a few exceptions. For the boys' case, the (weak) effect of MPCE and *mgedu* that showed up for the 61st round now disappears completely. On the other hand, the weak significance of *fgedu* (55th round) and general caste dummy (61st round) becomes stronger in the marginal analysis. So the marginal analysis provides stronger evidence for the importance of *fgedu* and lack of importance of *mgedu*.

For the harmful work case, we have not analyzed the girls' case as the incidences are too low. The goodness of fit is very poor for the 61st round and only household size turns out to be significant (negative). The 55th round results show no effect of HH or MPCE as well as *mgedu*. Father's education and occupation has significant negative coefficients showing the reduction effect of these two factors on harmful work incidence. Child's

Table 11 Harmful work, separate analysis for rounds (only significant variables)

Variable	55th round		61st round	
	Male		Male	
	Coefficient	T-ratio	Coefficient	T-ratio
HH	2.36E-02	0.64137	−0.12607	−2.7769
Hindu	0.36675	2.0992	−0.1152	−0.69467
FGEDU	−0.28868	−2.964	9.06E-02	0.94141
FOCU	−0.15614	−0.94275	−0.16852	−0.94294
MGEDU	−2.49E-03	−1.72E-02	3.83E-02	0.29692
CHEDU	−0.14318	−1.5623	4.64E-02	0.48873
CHWAGE	2.60E-03	4.2154	7.71E-04	1.3311
Constant	−1.4583	−3.9257	−0.25076	−0.64473
No. of obs.	435		374	
Log-likelihood (0)	−185.17		−169.58	
Log-likelihood	−133.20		−162.43	
Likelihood ratio test	37.9417		14.2910	
Mcfadden Rsq	0.10245		0.42137E-01	

Table 12 Harmful work, combined analysis for rounds (only significant variables)

Variable	Male	
	Coefficient	T-ratio
HH	−2.25E-02	−0.72678
Hindu	0.20555	1.3192
FGEDU	−0.28904	−2.9962
FOCU	−0.22371	−1.3948
MGEDU	−1.10E-02	−7.68E-02
CHEDU	−0.1736	−1.929
CHWAGE	2.23E-03	3.7361
DHH	−4.62E-02	−1.3083
DHINDU	−0.20599	−1.0035
DFGEDU	0.37004	2.7092
DFOCU	0.15519	0.66956
DMGEDU	7.14E-02	0.37217
DCHEDU	0.24798	1.9263
DCHWAGE	−1.13E-03	−1.4517
Constant	−0.88865	−3.3424
No. of obs.	809	
Log-likelihood (0)	−354.96	
Log-likelihood	−331.18	
Likelihood ratio test	47.5708	
Mcfadden Rsq	0.67008E-01	

education plays a similar role. *chwage* has a positive coefficient signifying that more dangerous jobs tend to pay better even in the child labour market (this holds for both the rounds). The marginal analysis of the harmful work case also confirms the above findings.

5 Concluding Remarks

This paper uses household level data from NSSO, 55th and 61st round (1999–2000 and 2004–05) for urban children, to show that school drop out rate (3.31% in 1999–2000 and 1.55% in 2004–05) and child labour incidence (2.04% in 1999–2000 and 1.7% in 2004–05) is not too small.[2] The parents' level of education plays an important role in reducing this tendency; thus establishing the linkage between social and human capital outcomes in the family. We also look at the incidence of harmful and manual occupations among the child labour. Father's education now appears as the more important factor in curbing these incidences. Our study emphasizes the importance of government policy making towards enhancing the quality of schooling and enforcing school attendance. Importance of adult education programme is also not small.

References

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education*. New York: Greenwood.

Brown, D. K., Deardorff, A.V., & Stern, R. M. (2002). The determinants of child labour: Theory and evidence. Discussion paper no. 480, Research seminar in international economics, School of Public Policy, University of Michigan.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, 95S–120S.

Delap, E. (1998). The determinants and effects of children's income generating work in urban Bangladesh, mimeo.

Das, S., & Mukherjee, D. (2007). Role of women in schooling and child labour decision: The case of urban boys in India. *Social Indicators Research, 82*(3), 463–486.

Grootaert, C., & Patrinos, H. A. (1998). The policy analysis of child labor: A comparative study. St. Martin's Press.

Heady, C. (2000). *What is the effect of child labour on learning achievement? Evidence from Ghana*, Innocenti working paper no. 79. Florence: UNICEF Innocenti Research Centre.

Heltberg, R., & Johannesen, N. (2002). *How parental education affects child human capital: Evidence from Mozambique*. Institute of Economics, University of Copenhagen, Discussion paper 02-04.

International Labor Organization—International programme on the elimination of child labour (1996). *Child labour: What is to be done, Document for discussion at the Informal tripartite meeting at the ministerial level*. International Labour Office, Geneva

Janssens, W., van de Gaag, J., & Gunning, J. W. (2004). *The role of social capital in early childhood development: Evidence from rural India*. Amsterdam Institute of International Development.

Loury, G. C. (1977). A dynamic theory of racial income differences. In P. A. Wallace & A. M. La Mond (Eds.), *Women, minorities, and employment discrimination*. Lexington: Heath Publishers.

Loury, G. C. (1981). Intergenerational transfers and distribution of earnings. *Econometrica, 49*, 843–867.

NSSO (2001). *Employment and unemployment situation in India, 1999–2000*. Ministry of Statistics and Programme Implementation, Govt. of India.

Ray, R. (2000a). *The determinants of child labour and child schooling in Ghana, mimeo*. University of Tasmania.

Ray, R. (2000b). Child labour, child schooling and their interaction with adult labour: Empirical evidence for Peru and Pakistan. *World Bank Economic Review, 14*, 347–367.

The Probe Team (1999). *Public report on basic education in India*. New Delhi: Oxford University Press.

---

[2] See discussion on child labour incidence in Sect. 3. The corresponding figures for Ghana (1991–92, rural and urban combined) are 28% and 0.8% and for Pakistan (1991) are 44% and 14.5% (Heady 2000).