The School Going Child Worker: An Analysis of Poverty, Asset Inequality and Child Education in Rural India

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The School-Going Child Worker:

An Analysis of Poverty, Asset Inequality and Child Education in Rural India

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Abstract

In examining child work and education in rural India, I find that Parental education and hours of non household child work demonstrate a U shaped relationship. I contend this is due to weak labor markets for skilled workers in rural India that creates a "high education trap." This results in poverty and perpetuation of child work in households with highly educated parents. School attendance is feasible even for child workers, but is conditional on continuity of enrollment. At 30 hours of non household work per week, school enrollment in the previous year ensures that the probability of attendance in the current year is 93 percent.

JEL Classification: D13; I21; I32; O15; O17; O53

Keywords: Child work; Child labor; Child education; Rural India; Poverty; Gender discrimination.

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1. INTRODUCTION

A central debate in the child labor literature concerns the relationship between child labor and poverty (Basu and Van, 1998; Gupta, 2000), and the impact of parental education on child work and education (Bacolod and Ranjan, 2008; Ray and Lancaster, 2005). This paper estimates the impact of asset affluence, public infrastructure and parental education on child education and child work in rural India. The theoretical model examines full family income, parental utility function, and child time allocation. Parents maximize their utility subject to the selected budget constraint and allocate child time among three alternative activities: study, leisure, and work. Three types of child activities in poor households -- the idle child, the unschooled child worker, and the school-going child worker -- are discussed based on alternative allocation of child time at the optimal point.

In the empirical application, Using the National Family Health Survey (NFHS 2005-2006) of India, I show that School attendance is of a continuous nature and the difference between the school-going child worker and unschooled child worker is conditional on school enrolment in the previous academic year.

Parental education and child work demonstrate a U shaped relationship. I contend that this surprising result is due to non existent labor markets for adult skilled workers in rural India. Scanty opportunities for highly educated and skilled parents create a “high education trap,” resulting in poverty and perpetuation of child work even in households with highly educated parents. A sharper upward slope in the curve for mother’s education suggests another feature of the Indian rural labor market. Gender discrimination in the market for skilled labor means that highly educated women pay an additional penalty, resulting in more poverty and higher hours of child work.

The paper is divided as follows. Section 2 discusses relevant literature and contribution of this paper. Section 3 outlines the theoretical framework. Section 4 reports results from the empirical investigation. Section 5 analyzes empirical findings. Section 6 concludes the paper.

2. LITERATURE REVIEW

An emerging debate in the literature on child labor is the question of whether child labor is a phenomenon of poverty only, or whether child labor can persist at higher levels of family income. If child labor is a result of poverty only, then it would be a "luxury." If child labor persists at higher income levels, then parents would be selfish, discounting future development of children in favor current consumption. Basu and Van (1998) discuss these possibilities by developing the luxury axiom and substitution axiom. Adult and child wage rates, and labor demand functions are used to develop a model of multiple labor market equlibria, where children work at one equilibrium but do not work at another. The luxury axiom leads to the assumption that parents do not use child work unless parental income falls below a minimum subsistence level. The substitutability axiom implies that adult labor and child labor are substitutes, via an "adult equivalent scaling". Depending on the comparison of adult wage and effective child wage, firms employ only adults, only children, or both adults and children. Bhalotra (2007) makes a similar assumption as the luxury axiom, demonstrating that if child work is used only for survival, then the wage elasticity of labor supply should be negative. In the context of rural Pakistan, Bhalotra (2007) studies the impact of child wage, parental income, land ownership and parental education on hours of child work separately for boys and girls. The conclusion is that child work is indeed driven by poverty and not selfishness on part of parents.

Contrary to the above findings, Parsons and Goldin (1989) use the 1907 surveys of child labor in America and find that self-interest of parents prevailed over altruism in the late nineteenth century, driven by a low expectation of receiving a share of children's adult earnings, and "a willingness on the part of working-class parents to sell cheaply the future income streams of their offspring for current consumption purposes." Gupta (2000) discusses child wage determination as a result of bargaining between parents and employer. Wages are paid in kind (which is the only compensation received by the child in the form of meals) and cash (which is taken by the parent). Gupta contends that exploitation of child worker is not by employer, since the employer pays the child worker according to their efficiency function. Rather, child workers are exploited by their guardians who extract part of the compensation paid to the child through their bargaining power. Ray (2000) in a comparative study of child labor and school attendance in Peru and Pakistan rejects the luxury axiom, concluding that the probability of child employment does not reduce significantly in either country with income. Bhalotra and Heady (2003) draw similar conclusions in a study on persistence of child work in rural, land rich households of Pakistan and Ghana. Edmonds (2005a) in a study of Vietnam, finds a non linear relationship between economic status and child work. The impact is more pronounced in poorer household than in rich households, but child work in the poorest and richest households is not sensitive to economic status. Bacolod and Ranjan (2008) find ambiguous answers. In poorest household, children of low ability will be sent to work, but children of high ability will work and go to school. Children in higher asset index households are less likely to be idle or work full time, but children in household with higher "house index" are more likely to work.

A second debate in the literature relates to the impact of parental education on child work and education. Bacolod and Ranjan (2008) do not find a significant influence of either parent's

education on child time allocation. Bhalotra (2007) finds a negative but insignificant impact of father's education on hours of child work, but finds a positive and significant impact of mother's education on hours of child work. Bhalotra and Heady (2003) also conclude that investment in women's education will reduce child work and improve school attendance, and this impact would be beneficial to future generations as well. Ray (2000) finds a negative and significant impact of female education on probability of child work, and the opposite impact of female education on child school attendance. Chernichovsky (1985), in a study of school enrolment and attendance in rural Botswana finds a strong positive impact of education of household head on children's school enrolment, concluding that educated parents will send their children to school and will also keep them enrolled longer. Rasheda and Russell (2005) find that mother's education has stronger positive impact on age appropriate schooling of children than father's education. Ray and Lancaster (2005) report significant impact of parental education on child schooling.

An emerging point of consensus is that child work has a negative impact on children's educational attainment. Baland and Robinson (2000) contend that child labor adversely affects children's future earning ability. It is inefficient when parents are very poor, have zero bequests and face imperfect capital markets, and when parents do not realize that there are private returns to children's human capital formation. Calva and Miyamoto (2004) conclude that increase in return to schooling investment reduces child labor. Emerson and Souza (2007) in a study of Brazil, find that older children are likely to command higher wages, more likely to work, and less likely to attend school than later born siblings. Ray and Lancaster (2005) find that child school attendance is "habit forming" i.e. children who are already going to school are less likely to dropout. Psacharopoulos (1997) uses Bolivian and Venezuelan data to find that children who

perform “non- trivial” work have two years less of schooling than children who do not perform child work. Akabayashi and Psacharopoulos (1999) find that child work reduces their mathematical and reading skills.

In exploring the impact of poverty, existing studies look at the impact of parental income, household consumption expenditure, or per capita expenditure on child work (Bacolod and Ranjan 2007; Bhalotra 2007; Ray 2000). I contend that if economic inequality is severe, then the relationship between parental income and child work may not be obvious, since a majority proportion of households are poor and will have very low share of national income, and these may also be the households where child work is incidental. If that is the case, then it may appear that an increase in parental income increases child work. However, increase in income at the lower end of income strata may not indicate significant improvement in economic status. Hence, the understanding of the relationship between parental affluence and child work requires the use of a variable that measures economic inequality.

I introduce economic inequality explicitly in the analysis and argue that in rural India, economic inequality significantly increases child work incidence. To this end, an “Asset Affluence Indicator” is developed in this paper. The AAI does not measure income or household expenditure. It is the weighted sum of 39 household assets, the weights being the inverse of sample ownership rate. A major advantage of the AAI is that because of the inclusion of a wide range of assets and because of the way it is weighted, the AAI is a comprehensive measure of asset inequality in the sample, with higher weight assigned to luxury assets and lower weight assigned to essential assets. I use the AAI to measure the impact of economic inequality on child work. Similar logic was applied in creating an index of public infrastructure. The weights are now the inverse of penetration rate.

Authors of existing literature have used asset ownership as indicators of economic status, but not as a comprehensive measure of economic inequality. For example, Bacolod and Ranjan (2007) use four asset indicators: housing index (quality of housing construction, number of rooms etc.), asset index (household consumer goods), facilities index, and resource index (school infrastructure). However, their indices were created using either factor analysis or a simple sum of indicators. Similarly, Ray (2000) and Akabayashi and Psacharopoulos (1999), use dummy variables for public utilities and household assets,

This paper adds to the understanding of the relationship between parental education and child work by showing that this relationship is non linear. Using quadratic terms for parental education in the regression equations, I find a U shaped relationship between mother's education and hours of child work (non household and household), and a similar U shaped relationship between father's education and hours of non household work. Only father's education and hours of household chore has the expected negative relationship. The U shaped relationship is sharper in case of mother's education. The same U shaped relationship is found between parental education and probability of school attendance. These findings contradict existing understanding of the impact of parental education, especially mother's education. I contend that this result may not be as surprising as it appears at first. The impact of parental education can be offset if labor markets for skilled workers and professional workers are under developed or even non existent, thus creating a "high education trap". High education, in combination with lack of experience with unskilled work leads to scanty job opportunities for the educated in rural India.

Beyond certain years of education, parents can actually have lower income than less educated counterparts, and if this also brings them below the poverty threshold, they may have to use more hours of child work to close the minimum consumption gap. Hence, the simultaneous

development of rural labor markets and educational system is necessary for higher rate of return to education. Only then will parental education have its expected impact on child labor incidence.

Policy prescriptions for reducing child labor incidence and encouraging child education include laws banning child labor (Dessy and Knowles, 2007), public utilities, (Akabayashi and Psacharopoulos, 1999; Calva and Miyamoto, 2004; Ray, 2000; Ray 2001), well functioning financial, land and labor markets, (Bhalotra and Heady, 2003), and technological improvement (Calva and Miyamoto, 2004).

This paper contributes to these policy discussions by inferring that public policy encouraging child education can ensure their human capital formation; even that of child workers. Education is of a continuous nature, and school enrolment in the previous year almost invariably ensures continued attendance. The probability of school attendance conditional on past attendance is 100 percent in case of no child work, and 93 percent at 30 hours of weekly non household work. These probabilities reduce to 28 percent and 5 percent, respectively, conditional on non attendance the previous year. This inference finds support in existing research on the impact of government program on educational attainment and eventual wage increase. For example, Duflo (2001) finds that school construction with government support increases encourages children in completing education, and results in returns to education to range from 6.8 percent to over 10 percent.

3. THEORETICAL MODEL

3.1 Family, Utility Function And “Full Family Income”

In this section, I develop a one period model of utility maximization and time allocation of poverty and child time. A family is assumed to consist of two parents and one child. Rational parents are the sole decision makers in the family and perform their social and economic roles by maximizing utility derived from investment in their child and consumption of a basket of goods and services, subject to a family budget. Education is assumed to be the only investment in the child, and is purchased from the market. Consumption is assumed to be produced through household work only, with the aid of household assets, such as appliances. Household work is assigned a money equivalent value. Parents divide their own time into market work (for earning money income) and housework (for home production of consumption). Parents also allot child time between studies, leisure, and child work. The sum of market income of parents and child, money equivalent of household work performed by parents and child, and interest earned on savings is defined as full family income.

3.2 Poverty Threshold and the Alternative Budget Constraints

Incorporation of parental altruism and its temperance in the face of poverty is achieved by assuming that every family, regardless of income status, has two budget constraints: one where parents are sole earners and sole contributors to full family income (equation 3(A) below), and another where both parents and child contribute to full family income (equation 3(B) below). A family is defined as living below the poverty threshold if, under the condition that parents are the sole contributors to full family income, devoting the income entirely towards consumption would leave the family below subsistence level. To address parental paradox and altruism, I follow the luxury axiom of Basu and Van (1998) and assume that parents use child work only for meeting a certain poverty threshold. All parents above the poverty threshold are altruistic and do not

involve child time for raising family income[1]. Altruism is less feasible for parents living below the poverty threshold. Parents may be forced to shift the family budget constraint outward by "choosing" to receive additional family income by allotting a fraction of child time towards work.

However, irrespective of the degree of poverty, parents arbitrarily determine a limit $\overline{\beta}$ on child time that can be used towards income contribution, so that every child gets at least some leisure or study time. Taken together, the outlined framework is expressed with the help of the following set of equations.

Family utility function

$$U = U(C, \varepsilon) \cdots\cdots\cdots\cdots (1)$$

$$C = n_B A_B + n_L A_L \cdots\cdots\cdots\cdots (2)$$

Alternative family budget constraints

(3A) $C + P_\varepsilon \varepsilon = M_\phi + V_\phi + gS_\phi$ **IF** $\left(M_\phi + V_\phi + gS_\phi\right) \geq n_B A_B$

(3B) $C + P_\varepsilon \varepsilon = \left(M_\phi + M_\kappa\right) + \left(V_\phi + V_\kappa\right) + gS_\phi$ **IF** $\left(M_\phi + V_\phi + gS_\phi\right) < n_B A_B$

$$0 \leq T_\omega \leq \overline{\beta}$$

C = family consumption with price normalized to 1.

A_B = Value of essential household assets owned (necessities)

n_B = Proportion of A_B consumed

$n_B A_B$ = Measure of poverty threshold

A_L = Value of non essential household assets owned (luxuries)

[1] Relaxing this assumption does not alter basic results of the model.

n_L = Proportion of A_L consumed

ε = units of child education

$\mathbf{M_\Phi}$, $\mathbf{M_\kappa}$ = market income of parents and child, respectively.

V_ϕ, V_κ = money equivalent of home production of parents and child, respectively.

$\mathbf{S_\Phi}$ = family savings contributed by parents only; for simplicity it is assumed that the child does not contribute towards savings.

g = interest earned on savings bank account holdings

$\mathbf{P_\varepsilon}$ = price per unit of child education

$(M_\phi + M_\kappa) + (V_\phi + V_\kappa) + gS_\phi$ = full family income

T_ω = child time allotted to work.

$\bar{\beta}$ is the parent determined maximum limit on child time devoted towards work.

3.3 Poverty Threshold

The family owns appliances valued at ($A_B + A_L$), and consumes a proportion (n_B, n_L) of the total ownership of appliances at every time period. Consumption C consists of the "necessities" component $n_B A_B$ at which the family is at the poverty threshold. Any consumption below $n_B A_B$ places the family below the poverty threshold. Any consumption over and above the threshold $n_B A_B$ is assumed to be derived from the use of both necessary and luxury household assets. This implies that families at or below the poverty threshold do not own any luxury assets i.e.

$C \leq n_B A_B$ defines "at or below poverty threshold"

$C \geq n_B A_B$ defines "above poverty threshold"

3.4 Child Work Defined

Parents' decision about child time allocation between the three alternative activities --study, leisure, and work-- is accepted by their child. For simplicity, I assume that every unit of child time is equivalent to one unit of educational attainment i.e.

$$\varepsilon = T_{\varepsilon} \cdots\cdots\cdots\cdots (4)$$

The child's time and budget constraints are as follows:

$$T_K = T\varepsilon + T_\ell + T_\omega \cdots\cdots\cdots\cdots (5)$$

$$M_K + V_K = W_K T_\omega$$

$$W_K = 1$$

Hence, $M_K + V_K = T_\omega \ldots\ldots\ldots\ldots (6)$

Substituting (3) into (4), gives the combined child budget constraint:

$$M_K + V_K = T_K - (T_\ell + T_\varepsilon) \ldots\ldots\ldots\ldots\ldots (7)$$

T_K = total child time T_ω = work time $T\varepsilon$ = study time, T_ℓ = leisure time, W_K = child wage rate or its home production equivalent, normalized to one.

Equation (6) defines child work as any household (V_K) or non household work (M_K) performed by the child if their parents allocate a fraction of child time $\left(\frac{T_\omega}{T_K}\right)$ to such household or non household work.

3.5 The Optimization Process

Parents choose the budget constraint (3A) or (3B) they want the family to be on by setting the value of $M_K + V_K$, and hence from (6), setting the value of T_ω. Maximizing the utility function (1) subject to the chosen constraint gives the optimal choice of family consumption and child education. From (4), the optimal choice of education also gives the child time allotted to studies. Once T_ω and T_ε are determined, (5) gives T_ℓ.

This is illustrated in figure 1 for a family that is above poverty line. Hence by assumption, parents allot child time between leisure and studies only. Budget constraint 3(A) is represented by DD_1 in panel 1. The optimal point is obtained at the point of tangency between DD_1 and indifference curve U_1.The optimal consumption and education level chosen by parents are (C_1, ε_1); $C \succ n_B A_B$. Panel 2 of figure 1 illustrates the combined time and money income constraint of the child (Line T_1T_1). The sum of time allotted to leisure and studies is measured on the vertical axis. The sum of money income and its equivalent that a child can earn by doing non household work or household chores is measured on the horizontal axis. Equations (4), (5) and the optimal point together imply that the child does not work ($T_\omega = 0$), studies for $\mathbf{T}_{\varepsilon 1}$ ($=\varepsilon_1$) hours, and enjoys leisure for the remaining time ($T_K - \varepsilon_1 = \mathbf{T}_{\ell 1}$ hours).

[Figure 1 here]

3.6 Parental Education Parameter ψ

ψ is a non negative exogenous measure of parental education and influences the importance attached by them towards child education as an investment in their future, and is independent of the financial condition of the family. In terms of indifference curve terminology, this implies a certain degree of preference of more educated parents for child education and the rate at which

they are willing to sacrifice current consumption for investment in their future. The steepness of the indifference curve between child education and consumption is driven by the parameter ψ. Figure 2 illustrates the differential impact of parental education parameter ψ. The first household with more educated parents have parameter value ψ_1 and flatter indifference curve ($\mathbf{U}\ \psi_1$) compared to the second household that has lower parameter value ψ_2, and hence steeper indifference curves. More child education and lower consumption is chosen at the optimal point by parents of the first household as compared to the second household. Children of the first household are hence required by their parents to study longer hours ($\mathbf{T_1}=\boldsymbol{\varepsilon_1}$).

[Figure 2 here]

3.7 Public Infrastructure Parameter θ

This is an exogenous measure of economic development in the city/village where the household is located. Parents' desire to provide children with education needs to be supported by public infrastructure, such as schools, teachers, bookstores, and electricity. Availability of public utilities is likely to encourage child education, even in the face of poverty. For example, facilities of free schooling, mid-day meal plans and subsidized tuition fees will encourage parents to educate their children, as compared to parents who do not have access to such amenities. Hence, public infrastructure has a similar impact on the slope of the indifference curve as parental education. The more developed the public infrastructure, the flatter the indifference curve, and higher the child education is chosen by parents at the optimal point.

3.8 Three Cases of Child Time Allocation

<u>The Idle Child</u>

Focusing on families that live below poverty line, one possible outcome arises for a family that lives below the poverty line but whose parents have made a conscious decision not to involve their child in work. Consider the case of a child with disability or the case of parents who think it is morally incorrect to make children work. The relevant budget constraint is 3(A) or JJ_1, as shown in figure 3. Even if parents allotted their entire income to consumption only, the family would still live in poverty. Suppose that parental education is zero years and the value of the education parameter ψ is so low that the indifference curve is vertical. The optimal point is a corner solution at J_1, where parents devote their income entirely towards family consumption only. Consequently, in panel (b), $T_{\ell 3} = T_{\kappa}$, and $T_{\varepsilon}=T_{\omega} =0$. Thus, the family continues to face severe poverty, the child is totally idle at home and time not allotted towards studies due to unaffordable educational expense is not allotted towards any alternative activity.

[Figure 3 here]

The Unschooled Child Worker

Consider the case of a family below the poverty line and where parents have made a decision to involve child time in work, since by doing so they will at least be able to bridge the consumption gap and maybe even the education gap. The relevant budget constraint is now 3(B). Two results are possible, and these are shown in figures (4) and (5).

[Figure 4 here]

In figure (4), parents decide to bridge only the consumption gap and utilize child time to ensure that the family is above the poverty line. Parents allot $\mathbf{T^*_{\omega 4}}$ hours towards child work. This

shifts the family budget constraint from KK_1 to QQ_1. Parents continue to allot their income to consumption only ($=Q_1$). Total family consumption increases to Q_1 due to child contribution amounting to K_1Q_1. Once again, assuming that the value of ψ is so low that the indifference curves are vertical, the optimal point is reached at a corner solution Q_1. Consequently, in panel (b), child time is now divided into work and leisure, but no time is allotted to studies. In this case, the child helps bring in income for improving the family's standard of living, but does not receive educational investment in return.

The School-going Child Worker

Figure (5) illustrates the case where parents are poor but more educated than in the previous cases, and hence have a higher value of ψ. They want to allocate at least some resources for child education, even if that entails severe hardship in terms of consumption. Initially, parents live below poverty line when they select constraint 3(A) (budget constraint RR_1). At this point, unaffordable expense rules out any possibility of parents investing any portion of their income in their child's education. The optimal point is at R_1, where parents are unable to rescue their family from severe poverty despite devoting all their income to consumption only. Child time is totally spent in leisure (not shown in panel (b) of figure 5). Now consider the case where the parents decide to involve child time for making ends meet. Suppose that the new budget constraint including child work is SS_1. Parents continue to contribute R_1 but now the child also makes a contribution R_1S_1, raising the total family income to S_1. The optimal point is an interior solution (C_5, ε_5). The family successfully raises its standard of living beyond the poverty line, and in fact can invest at least some resource towards child education. The family pools parental and child income to get this new higher income. Child time is now allotted between leisure, work, and

studies, as shown in panel (b). In this case, the child is actually better off working for some time because it increases the chance that parents will be able to afford educational expenses.

[Figure 5 here]

4. EMPIRICAL INVESTIGATION

In this section, I present an empirical investigation of the theoretical model of household poverty and child time allocation. The model outlined in section 3 implies a number of testable hypotheses whose exploration facilitate understanding the impact of poverty, parental education, and public infrastructure on child time allocation between education and work. The hypotheses are:

I. Household affluence **C** has a negative impact on hours of child work T_{ω}.

II. Household affluence C has a positive impact on child education ε.

III. Parental education ψ has a negative impact on hours of child work T_{ω}.

IV. Parental education ψ has a positive impact on ε.

V. Public infrastructure θ has a negative impact on T_{ω}.

VI. Public infrastructure θ has a positive impact on ε.

Hypotheses I, III, and V imply the following functional relationship:

$$T_{\omega} = f\left(C(A_B, A_L), \psi, \theta, controls\right) \ldots\ldots\ldots\ldots (8)$$

Similarly, hypotheses II, IV and VI imply the following functional relationship:

$$\varepsilon = f\left(C(A_B, A_L), \psi, \theta, controls\right) \ldots\ldots\ldots\ldots (9)$$

4.1. Data

I fitted regression models to relationship (8) and (9) and used the National Family Health Survey (NFHS) 2005-2006 of India to explore the outlined hypotheses. Administered by the Ministry of Health and Family Welfare and Government of India, the NFHS collects household level data on demography, health, labor market, education, mortality and morbidity in rural India. The 2005-2006 wave surveyed 543,734 household members belonging to 109,041 households across rural and urban locations. The person recode of the survey included questions on child work for children aged 5-14 years, including hours of child work one week prior to survey, work status for household chores and non household work in the one week prior to survey, and work status one year prior to survey. Child education variables include school attendance status in the year of survey and one year prior to survey, and level of educational attainment in the year of survey. The household recode gives information on parental background characteristics. I merged the person recode file with the household recode in order to synchronize child characteristics and parental education variables.[2]

The survey makes a distinction between two types of child work: non household work, and household chore. Hours of both types of child work one week prior to the survey were selected to represent T_{ω} to test relationship (8) by running separate regressions of hours of non household work and hours of household chores. [3] School attendance status in the year of the survey was selected to represent ε to test relationship (9).[4] Of the 543,734 individuals surveyed, 128,594 (approximately 24 percent) were children between ages 5 and 14 years. Response to questions on child work was obtained from127,606 children. Within this sub sample, 6.1 percent of children performed non household work in the one week prior to the survey, and 56.5 percent

[2] Further information on the survey in IIPS and Macro International (2007.)
[3] For the rest of the paper, "hours of child work" always refers to hours of work one week prior to survey. Non household work does not include information on nature of work performed, except that it was performed for a non household member and whether it was paid or unpaid.
[4] The author acknowledges that school attendance status does not represent hours of study or quality of education.

performed household chores during the week prior to survey. The average hours of non household were 13.17 hours per week. The average hours of household work were 9.80 hours per week. Table 1 shows the percentage distribution of hours of work performed by children by location.

Table 2(a) and 2(b) show the summary statistics on child education and hours of work. 73 percent of children attended school during the 2005-2006 academic year, irrespective of work status and education level appropriateness.[5] 65 percent of all children were pursuing education at their age appropriate level. Children at age inappropriate educational level include 27 percent (of all children) who have never attended school. Of the children who did not attend school in 2005-2006, 95 percent had also not attended school in the previous academic year (2004-2005).

60 percent of children who did at least five hours of non household work in the one week prior to survey have never attended school. 60 percent did not attend school in 2005-2006, 37 percent attended school at age appropriate level, and 3 percent attended school at age inappropriate level. Among children who performed more than 28 hours of household chores, 50 percent have never attended school. 50 percent did not attend school in 2005-2006, 41 percent were attending school at age appropriate education level, and 9 percent were attending school at age inappropriate level.

[Table 2a and 2b here]

Parental education (in years) was selected to represent ψ.

[Table 3a and 3b here]

[5] Children between age 5 and 11 who are at least at primary school level and children between ages 12 and 14 who are at least at secondary level are attending school at age appropriate level.

4.2. The Asset Affluence Index

Household affluence variable $C(A_B, A_L)$: The survey reports a number of household asset ownership variables. The asset variables record the ownership of assets, but not their quality, cost, vintage, or depreciated value. Nonetheless, a major advantage of the asset ownership variables in the NFHS dataset is that it covers a wide range of asset categories. I divided a total of 39 assets into five asset categories, and used the asset categories to create an **Asset Affluence Index (AAI).** Each asset is an indicator variable. The asset categories and assets included in each category are given in appendix A.

Households were assigned a weighted asset category score in each of the five categories, using the following formula:

$$A_i = \sum_{j=1}^{n} a_{ij}\upsilon_{ij} \cdots\cdots\cdots\cdots (10)$$

Where,

A_i = Asset category

i = 1, 2,…,5.

j = 1,…..,n.

a_{ij} = 1 if household owns asset j within category i

= 0 otherwise

υ_{ij} = weight

The weights υ_{ij} are the inverse of the proportion of all households who own the asset (i.e. the ownership rate). This allows me to make a distinction between essential assets and luxury assets. The rationale is that the higher the proportion of households who own the asset, the more basic and affordable it is, and hence is less indicative of affluence. For example, only

7.1 percent of rural households own a refrigerator (a luxury in rural India), while 84 percent own a cot (an essential good). This assigns a weight of 14.08 to refrigerator ownership and a weight of only 1.19 to cot ownership. Hence, a household that owns a cot but does not own a refrigerator is assigned a lower AAI than a household that owns a refrigerator. In general, a higher AAI indicates higher overall affluence of a household.[6] Appendix B shows the assets that were included in each category, ownership rates, and the corresponding weights. Appendix B also shows the maximum possible weight that any household can score in any category and also in the overall AAI. For example, in the farm investment category, if a household owns each and ever farm asset, i.e. own an animal-drawn cart, a water pump, a thresher, a tractor, and livestock/herds/farm animals, then this household is assigned the maximum possible score, which is 81.3236. As a second example, if a household owns an animal-drawn cart and a thresher, but does not own a water pump, a tractor, or livestock, then this household gets a score of 42.1196 (10.8696 + 31.25 from table 4) in this category. By similar logic, the maximum possible AAI score is 701.5736, where a household owns each and every of the 39 assets, and the minimum possible is 0, where a household owns exactly zero out of the 39 assets.

The AAI –" A " - was calculated as the sum of the individual weighted asset category score i.e. [7]

$$A = \sum_{i=1}^{5} A_i \cdots\cdots\cdots\cdots (11)$$

[6] It is possible that some assets are inferior goods. In that case, low percentage of ownership, perhaps by only very poor families would also give a high weight, but this naturally would be misleading, and would not indicate higher affluence. To avoid this issue, while creating the AAI, I included only those assets that are normal goods.

[7] Since the asset category total (see equation 10) is the sum of individual asset weights, the category weights are in effect influenced by the number of assets in the category. Since the number of assets in each category was uneven, there is an upward bias for categories that included more assets and similarly a downward bias for those categories that included fewer numbers of assets. To work around this problem, I tried an alternative method of creating the comprehensive index, where I weighed down (or up) each asset category weight by multiplying the weights by the inverse of the probability that an asset was selected for that particular category. This method did not make any difference to overall result and hence is excluded from the discussion.

The use of an asset index such as the AAI has additional advantages. First, income variables can be imprecise due to respondent error, suppression of illegal components, etc. Second, income can be erratic by nature. Specifically for rural sub sample, income is of a seasonal nature, and the income variables will not capture this seasonality. Assets as determinants of affluence do not have these disadvantages because assets are visible to the enumerator and are difficult to conceal. Assets are built by a family over time, and have an element of income smoothing, signifying the overall affluence of a family. Third, in studying the impact of household affluence on hours of non household work, the question of reverse causality naturally arises. In this paper, child work was measured by hours of non household work in the week before the survey, while a total of 39 assets were used to develop the AAI. Given that assets are built over time, it is unlikely that income from child work increased family income so much that all 39 assets were accumulated in the exact seven days prior to the survey. Also, it is logical to assume that child work is used for basic consumption assets. It is unlikely that child work would be used for purchasing luxury assets. (Majority of the 39 assets are luxury assets in rural India). Hence, child work alone will not significantly influence a household's rank in the AAI ladder. Taken together, reverse causality appears to be an unlikely problem.[8]

Care needs to be exercised while interpreting the AAI. The AAI is not a measure of monetary value of asset ownership. Nor is it a measure of household income. It is simply an index to place households on the asset inequality continuum. While presumably there is a high correlation between asset ownership and income (Deon and Pritchett, 2001; McKenzie, 2004), the AAI is not a precise measure of income. The weights used were based on ownership rate (and hence affordability) of an asset. Because of the way the weights were formulated, the AAI is a

[8] The reverse causality problem of course, applies mostly to paid non household work, and not so much to unpaid non household work or household chores.

measure of asset inequality, and hence is best used for placing household at different points on the AAI continuum. The maximum AAI of around 600 and the minimum of 1.27 gives us the range over which every households can be plotted. A higher AAI denotes a higher affluence, but it also indicates higher inequality, indicating that the underlying assets are largely affordable to other households. A more equitable distribution of assets across rural household would reduce the weights on luxury assets and bridge the gap between the minimum and maximum AAI, raising the minimum AAI and lowering the maximum AAI. Given the asset inequality in the rural sample, the AAI is bounded as follows: $1.27 \leq \boldsymbol{AAI} \leq 598.56$**.** A higher AAI is undesirable because it would indicate that asset inequality has increased!

[Figure 6 here]

[Table 4 here]

4.3 Public Infrastructure Index θ

The NFHS reports several variables that indicate whether a household has access to essential public utilities, such as electricity, improved source of drinking water, and whether the household is in a location covered by Anganwadi/ICDS centre[9]. Using a similar procedure, I used these public utility variables to develop a weighted Public Infrastructure Index (PII) as follows:

$$\theta = \sum_{l=1}^{3} a_{\theta l} \upsilon_{\theta l} \quad \ldots\ldots\ldots\ldots (12)$$

[9] ICDS stands for Integrated Child Development Services. Started in India in 1976, the ICDS provides health and educational services to women and Pre School children aged 3 to 6 years. The services are provided through Anganwadi, which is a childcare center located in a village or slum. See Kant et al. (1984) for further information on the ICDS program.

The weights, as before, are the inverse of accessibility rate. Appendix D lists the public utilities that were used to create θ.

Control variables including state of residence, number of household members, and dummy variables for gender of household head, gender and age of child, whether the child is son/daughter of household head, and whether household has a Below Poverty Line (BPL) card were included.

4.4 Regression Model of Hours of Child Work

Relationship (8) was tested by fitting a linear regression model of hours of child work in the one week prior to survey on household asset index, parental education, and public infrastructure index, along with other control variables. Results are shown in table 5 for non household work and in table 6 for household chores. In both non household work and household chore regressions, mother's education has a negative but increasing and significant impact. Father's education has a negative, increasing and significant impact on non household work only. Father's education has a negative and decreasing impact on hours of household chore, but this impact is not significant. The negative but increasing impact of parental education on non household work is surprising and is discussed further in section 5.2. The Asset Affluence Indicator and Public Infrastructure Index, as expected, have negative and significant influence on the two types of child work. Amongst control variables, child age increases hours of non household and household work. While child gender does not have a significant impact on non household work, the girl child has significantly higher hours of household chores.

[Tables 5 & 6 here]

In terms of magnitude of coefficients, Public Infrastructure Index has the largest negative coefficient and child age has the largest positive coefficient in the non household work regressions. For household chore hours, child age has the largest positive coefficient, while child gender has the largest negative coefficient, followed by the Public Infrastructure Index, and mother's education.

Relationship (9) was tested by fitting a probit equation of probability of school attendance in 2005-2006. In addition to the explanatory variables and controls described used to test relationship (8), a dummy variable indicating school attendance status in the previous year 2004-2005 was also included for (9). Results are displayed in table 7. All coefficients have the expected signs. Parental education, AAI, and Public Infrastructure Index have positive and significant impact on probability of child attendance. Amongst control variables, a boy child is significantly more likely to attend school than girl child, and school attendance in the previous year significantly increases the probability of school attendance the following year.

[Table 7 here]

5. DISCUSSION

The quantum of impact of parental education, public infrastructure, and household affluence and their interaction was explored using the regression coefficients presented in table 5-7. Results of this exercise are presented in table 8, which shows the predicted hours of non household work, household work, and predicted probability of school attendance in 2005-06 at the 20^{th} percentile, average, 80^{th}, and maximum AAI. All other regressors, including PII, are at the average. For parental education, the averages at every AAI level were applied. Evidently, due to severe asset

inequality, there does not appear much difference in hours of work between 20th and 80th AAI percentiles.

The sharpest decline in hours of work occurs at the top percentile. Holding all other regressor at the sample averages, the predicted hours of non household work range from 14 hours per week at the lowest percentile to zero hours at the highest percentile. A difference of only four hours is predicted between 20th and 80th percentiles. Hours of household chore ranges from 9.43 hours at the lowest percentile to 3.45 at the top percentile. Once again, not much difference is predicted in hours till the top AAI percentile is reached.

[Table 8 here]

5.1 The School-going Child Worker

Table 8 also reports the probability of child school attendance in 2005-06, conditional on attendance status in 2004-2005 at each AAI percentile. The predicted probabilities show evidence that child work and education are not necessarily mutually exclusive. In other words, the theoretical case of the school-going child worker is validated by the empirical results. The table shows that even at the lowest asset percentile, a child who works for 13.91 hours on non household work has a 99 percent chance of going to school, conditional on attendance the previous year. While poverty compels parents to allot child time towards work, child work does not rule out the possibility of education altogether[10]. Thus, we have the case of the school-going child worker. Similarly, the school-going child worker could perform 9.43 hours of household chores and still have a 99 percent chance of school attendance. These probabilities however, reduce drastically when predicted conditional on non-attendance the previous year, 2004-2005. For example, at the lowest percentile, a child could perform 13.91 hours of non household work

[10]The author acknowledges that quality of education and regularity of attendance during the academic years are important questions that cannot be addressed due to data unavailability.

but have only an 18 percent probability of school attendance, if they did not attend school the previous year. This is likely to be the case of the unschooled child worker. The probability of school attendance conditional on non attendance the previous year increases with AAI (and simultaneously, increase in parental education), and is in fact more than 60 percent at the highest percentile. These two results show that even in impoverished households, school attendance is of a continuous nature in rural India, wherein a child who is already enrolled in school is much more likely to have a chance to continue attending school than a child who is not already enrolled.

5.2 The Impact Of ψ

Given the nature of the relationship between parental education and non household work, particular care needs to be exercised while interpreting this impact. The regression coefficients in tables 5-7 report negative but increasing impact of mother's education on both types of child work and school attendance, and a similar impact of father's education on non household work and school attendance. The negative impact of mother's education on non household work peaks at 7 years of education and similarly the negative impact of father's education on non household work peaks at 11 years. Thereafter, an increase in parental education reverses the impact on non household work. For household chores, the negative impact of mother's education on hours peaks at 10 years of education. The impact of father's education is negative and decreasing (but not statistically significant). A similar negative and increasing impact of parental education on probability of school attendance was found.

Figures 7 and 8 show the relationship between parental education and estimated hours of work. For both types of work, a flat U shaped relationship exists for mother's education. Hours of non household child varies from 12.46 hours when mother's education is zero, to a minimum

of 10.50 at 7 years of education and increases sharply thereafter to 21.50 hours at 23 years of education. For father's education, the corresponding hours are 14 at zero years, reach a minimum of 10.33 at 11 years, and rises slowly thereafter to 15.50 hours at 23 years of education. Hence, the U shaped relationship for father's education is not very pronounced and is in fact very flat, but is more pronounced in case of mother's education. For household chores, increase in father's education continuously reduces hours of household chores, but in case of mother's education, displays a U shaped relationship (although much less pronounced than non household work)[11].

Focusing on non household work, the U shaped relationship between mother's education and non household work means that between two household with same AAI, the household with a highly educated mother (more than 7 years of education) will have more hours of non household work than the household with the less educated mother (less than seven years of education). At first glance, this result appears to contradict the contention that mothers who are more educated will lower hours of child work and increase hours of study. In fact, the empirical result seems to hint that higher education of mother is detrimental to child welfare. To resolve this apparent contradiction, recall from section 4.3 that the AAI is not a measure of family income. Hence, even the same AAI in two households does not imply that income is necessarily the same. If adult rural labor markets are such that unskilled or semi skilled workers are in demand but high skilled workers are unable to secure appropriate jobs, then there is a possibility that a household "***X***" where the mother is "over educated and over skilled" has lower income than another household "***Y***"where the mother is "less but suitably educated" (father's education is at average in both households). Assuming that in both households, total parental income alone would fall short of the poverty threshold, this implies from equation (3B):

[11] To ensure that the results were robust to the choice of education variable, I ran regressions using level of educational attainment of parents, instead of years of education. The results, not presented here, were similar.

$$\left(M_{\phi} + V_{\phi} + gS_{\phi}\right)^{X} < \left(M_{\phi} + V_{\phi} + gS_{\phi}\right)^{Y} < n_B A_B$$

Hence, household "X" with more educated mother will actually need to use more hours of child work to meet basic consumption needs! Note that both households can aspire for the same value of assets (and hence can have the same AAI). The difference is that the gap between parental income and the aspired asset value is bigger in household "X" due to less labor market opportunities available of the highly educated mother, requiring more hours of child work to meet the basic consumption gap.

The same logic explains the U shaped relationship between father's education and hours of non household child work. However, a sharper upward slope in the curve for mother's education hints at another feature of the Indian rural labor market whereby gender discrimination in the market for skilled labor means that highly educated women pay an additional penalty, resulting in more poverty and even higher hours of child work. Even if a motivated girl child somehow receives higher education, there are very few opportunities available where her knowledge and skills would be needed. If schools are too few, even teaching opportunities may not be available to her. In the meantime, time spent in education means that the she has probably not been able to devote time to learning farming skills, resulting in low chance of finding unskilled or semi skilled jobs. A combination of high education, gender discrimination in skilled labor markets, and lack of farming skills can actually backfire and create a "high education trap," for women, resulting in poverty even in households with highly educated mothers and average educated fathers. While the highly educated mother values education for her children, she may have to make a hard choice and allow her children to do non household work in order to meet basic consumption.

The impact of father's education on the other hand is not so pronounced because the skilled labor market, while offering meager opportunities is biased in favor of males, so that a household with highly educated father and average educated mother is poor, but not as much as households with highly educated mother and average educated father. In general, perhaps unskilled and semi skilled job dominate the rural labor market and skilled job opportunities are so limited that the rural labor market can support only a few years of education. Hence, the optimal years of education for both parents are low. Any further education above that has a reverse impact on child work.

Figure 9 shows that a similar relationship exists between parental education and school attendance. Once again, I find evidence that if children are already enrolled, the chances are almost 100 percent that they will continue to attend, irrespective of parental education. However, if the child did not attend school the previous year, then the relationship is hump shaped (although very flat). For both parents, initially as their education increases, the probability of attendance increases, but beyond a point it starts reducing. As in the case of child work, the relationship is sharper in case of mother's education, and in fact at 23 years of her education, the probability reduces from 22 percent at zero years of education to just 10 percent! In contrast, 23 years of father's education raises the probability from 18 percent at zero years of education to 24 percent. Once again, the analysis hints at a labor market that does not reward high education, and is also a discriminatory skilled labor market, where educated women do not find enough skilled opportunities are likely to have poorer households than less educated women, and hence less likely to be able to send children to school.

5.3 The Impact Of $C(\lambda, A)$ i.e. AAI and Asset Inequality

Moving from the lowest to the highest AAI percentile, (holding parental education and public infrastructure constant) would reduce estimated hours of non household work by more than 11 hours, and would reduce household chore hours by almost 5 hours per week. Once again, it is evident that asset inequality is a major cause of perpetuation of child work.

5.4 The Impact Of θ

While reducing the severity of asset inequality in a nation takes a long time and the analysis suggests that child work as it exists today may not be eradicated over the short run unless more equitable distribution of assets is achieved, public infrastructure can be deployed to at least support child workers and their parents by providing requisite educational support. The results show that public infrastructure plays a major role in improving child education and in reducing child work for three reasons.

First, a direct measure of the magnitude of the impact of public infrastructure is the public infrastructure variable θ. I calculated the predicted hours of child work within the public infrastructure index range, holding all regressors, including AAI at the average values. Results show that as we increase the public infrastructure index from zero to the maximum score of 4.08, hours of non household work at every level of parental education reduces by 6.58 hours per week, and hours of household chores reduces by 2 hours per week. Public infrastructure is of major importance because it indicates the role played by the government in improving children's education and in reducing child work. While the Public Infrastructure Index does not include "school availability" as one of the public amenities, the ones that are included (i.e. electrification, source of household water, and health centre coverage) are indicative of the chances that essential schooling infrastructure has reached the location where the child lives.

Second, an indirect measure of the influence of public infrastructure is the probability of school attendance conditional on enrolment in the previous year. As noted above, schooling is of a continuous nature i.e. children who are already enrolled are much more likely to continue schooling than children who are not already enrolled. Public infrastructure support such as building schools, education subsidies, recruiting and retaining teachers, free schooling, mid-day meal plans, subsidized tuition fees and building awareness amongst parents about the importance of schooling on children's future development can encourage schooling and hence increase the number of school-going child workers.

Third, in addressing education policy for future development, heed needs to be paid to the low levels of parental educational attainment in rural India. The sample average of mother's education is less than three years and father's education is less than five years. The educational system and rural labor markets do not support higher education and skilled labor as a means of improving household affluence and reducing child work. This hints at a larger rural developmental task, involving modernizing the education system and labor market so that the labor market opportunities can support highly educated, skilled workers, and hence reduce child labor incidence.

6. CONCLUSION

In this paper, I explore the impact of household affluence, parental education and public infrastructure on child work and child education in rural India. I contend that if economic inequality is severe, then understanding the relationship between parental affluence and child work requires the use of a variable that measures economic inequality.

An Asset Affluence Index (AAI) is developed as a measure of economic inequality. A major advantage of the AAI is that because of the inclusion of a wide range of assets and because of the way it is weighted, the AAI is a comprehensive measure of asset inequality in the sample, with higher weight assigned to luxury assets and lower weight assigned to essential assets. 80 percent of the rural sample has a share of less than 50 percent of asset affluence. The regression results show that weekly hours of child work reduce marginally from the lowest up to the 80th percentile of households. The estimated hours of non household child work range from 14 hours per week at the lowest AAI percentile to zero hours at the highest percentile. Estimated hours of household chore range from 9.43 hours at the lowest percentile of AAI to 3.45 at the top percentile.

This paper adds to the understanding of the relationship between parental education and child work by showing that this relationship is non linear. Parental education and non household child work demonstrates a flat U shaped relationship. The negative impact of mother's education on non household work peaks at 7 years of education and similarly the negative impact of father's education on non household work peaks at 11 years. Thereafter, an increase in parental education reverses the impact on non household work. These findings contradict existing understanding of the impact of parental education, especially mother's education. A similar U shaped relationship is found between parental education and probability of school attendance. This result may not be as surprising as it appears at first. I infer that this result is due to a feature of the Indian rural market that values low skilled or semi skilled workers more than high skilled workers. The sharper upward slope in the curve for mother's education hints at another feature of the Indian rural labor market whereby gender discrimination in the market for skilled female workers in rural India creates a "high education trap" for educated and skilled women, resulting

in more poverty and perpetuation of child work in households with highly educated mother and average educated father. Hence, the simultaneous development of rural labor markets and educational system is necessary for parental education to have its expected impact on reducing child labor incidence.

Hours of child work and probability of school attendance have a U shaped relationship, although the relationship does not become positive within a reasonable range of work hours. Within a range of zero to 30 hours per week of work, the probability of school attendance continuously reduces as hours of work increase, although this result is heavily dependent on whether the child attended school the previous year. Education is of a continuous nature, and school enrolment in the previous year almost invariably ensures continued attendance. The probability of school attendance conditional on past attendance is 100 percent in case of no child work, and 93 percent at 30 hours of weekly non household work. These probabilities reduce to 28 percent and 5 percent, respectively, conditional on non attendance the previous year. This finding supports in existing research on the impact of government program on educational attainment and eventual wage increase. I infer that given the current state of economic inequality, policy prescription for abolition of child labor may not have desired impact. However, public policy encouraging child education can ensure their human capital formation; even that of child workers.

While these findings contribute to the literature on child work, there are several qualifications that need to be taken into account. The AAI was created by the author using a number of assets and public utilities and all results are based on these author created indices. The AAI does not take into account the quality, vintage, or depreciated value of assets. The PII was

created with only three utilities, and does not include school availability. Other combinations of assets or other methods to create the weights and indices could change the results.

One of the control variables in the regressions was child gender. While child gender does not have a significant impact on non household work, the girl child has significantly higher hours of household chores. A boy child is significantly more likely to attend school than girl child. Future work in this area should be extended to detailed study of the differential impact of child gender on the nature and hours of child work and on education by studying the relationship between gender and possibility of the school-going child worker.

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TABLE 1: DISTRIBUTION OF HOURS OF WORK (T_{ω}) IN THE ONE WEEK PRIOR TO SURVEY BY CHILDREN 5-14 YEARS, 2005-2006 INDIA (PERCENTAGE OF CHILDREN)

	Rural		Urban	
Hours of work	Non household work	Household chores	Non household work	Household chores
0	93.2	41.6	92.1	48.8
At least one hour	6.8	58.4	8	51.2
Of children who worked at least one hour				
0 – 5 hours	52	26	63	40
5 - 10	15	37	10	35
10 - 20	9	24	7	17
20 – 28	9	9	7	6
> 28	15	3	13	2

TABLE 2A: NON HOUSEHOLD WORK PER WEEK (T_{ω}) AND EDUCATION OF CHILDREN (ε) 5-14 YEARS, 2005-2006 (PERCENTAGE OF CHILDREN)

	Rural			Urban		
Hours of work	No schooling	Age appropriate Schooling	Age inappropriate Schooling	No schooling	Age appropriate Schooling	Age inappropriate Schooling
0	13	81	6	20	74	6
0 - 5	18	78	4	14	82	4
5 - 10	33	61	6	32	61	7
10 - 20	49	42	9	46	48	6
20 – 35	70	25	5	67	31	2
> 35	88	10	2	87	10	3

TABLE 2B: HOUSEHOLD CHORE AND EDUCATION OF CHILDREN 5-14 YEARS, 2005-2006
(PERCENTAGE OF CHILDREN)

	Rural			Urban		
Hours of work	No schooling	Age appropriate Schooling	Age inappropriate Schooling	No schooling	Age appropriate Schooling	Age inappropriate Schooling
0	18	81	1	26	72	2
0 - 5	21	75	4	15	82	3
5 - 10	21	72	7	16	78	6
10 - 20	27	62	11	21	71	8
20 – 28	38	50	12	33	60	7
> 28	44	48	8	46	49	5

TABLE 3A: PARENTAL EDUCATIONAL ATTAINMENT (ψ) AND HOURS OF NON HOUSEHOLD WORK (T_{ω}) BY CHILDREN 5-14 YEARS, 2005-2006 INDIA

	Rural		Urban	
Hours of work	Mother's education in years	Father's education in years	Mother's education in years	Father's education in years
0	2.12	4.7	5.63	7.83
0 - 5	2.78	5.20	5.06	7.24
5 - 10	1.57	3.84	3.82	5.82
10 - 20	1.07	3.60	2.32	4.66
20 – 35	0.66	2.7	1.6	3.45
> 35	0.34	1.56	1.33	3.45

TABLE 3B: PARENTAL EDUCATIONAL ATTAINMENT (ψ) AND HOURS OF HOUSEHOLD CHORES (T_{ω}) BY CHILDREN 5-14 YEARS, 2005-2006 INDIA

	Rural		Urban	
Hours of work	Mother's education in years	Father's education in years	Mother's education in years	Father's education in years
0	2.50	4.85	6.13	8.13
0 - 5	2.55	5.00	5.82	7.90
5 - 10	1.82	4.64	4.80	7.30
10 - 20	1.34	4.13	3.68	6.60
20 – 28	1.03	3.81	2.75	5.54
> 28	0.86	3.45	2.30	5.10

TABLE 4: REGRESSION COEFFICIENTS OF HOURS OF NON HOUSEHOLD WORK, RURAL SUB SAMPLE

(Dependent variable T_{ω}: Hours of non household work one week prior to survey)

	Linear Regression (1)	Linear Regression (2)	Linear Regression (3)
Parental education variables			
Father's education in years	-.760***	-.704***	-.655***
Sq. of father's education	.035**	.034**	.031*
Mother's education in years	-.666***	-.564**	-.638***
Sq. of mother's education	.049**	.042*	.047*
$C(A_B, A_L)$: AAI	-.029***	-.019*	-.017*
Public infrastructure index	-----	-1.614***	-1.613***
Controls			
Household has BPL card? (1 = has BPL card)	-----	-----	1.011
Number of de jure members	.214	.179	.163
Sex of head of household (1 = Male)	.950	.822	.839
Child of household head? (1 = Yes)	1.219	1.163	.994
Sex of child (1 = Male)	.497	.412	.301
Age of child	1.528**	1.534***	1.520***
Adjusted R^2	0.316	0.324	0.327
State dummies included?	Yes	Yes	Yes

*** Significant at α =1%, ** Significant at α =5%, * Significant at α =10%

TABLE 5: REGRESSION COEFFICIENTS OF HOURS OF HOUSEHOLD CHORES, RURAL SUB SAMPLE

(Dependent variable T_{ω} : Hours of household chores one week prior to survey)

Explanatory Variables	Linear Regression (1)	Linear Regression (2)	Linear Regression (3)
ψ : Parental education variables			
Father's education in years	-.038	-.020	-.019
Sq. of father's education	-.002	-.003	-.003
Mother's education in years	-.219***	-.183***	-.181***
Sq. of mother's education	.011***	.008*	.008*
$C(A_B, A_L)$: AAI	-.011***	-.008***	-.008***
θ :Public infrastructure index	-----	-.490***	-.496***
Controls			
Household has BPL card? (1 = has BPL card)	-----	-----	.307***
Number of de jure members	.040	.037	.041
Sex of head of household (1 = Male)	-.267	-.325	-.377
child of household head? (1 = Yes)	.291	.251	.284
Sex of child (1 = Male)	-2.617***	-2.598***	-2.601***
Age of child	1.006***	1.013***	1.012***
Adjusted R^2	0.16	0.162	0.162
State dummies included?	Yes	Yes	Yes

*** Significant at α =1%, ** Significant at α =5%, * Significant at α =10%

TABLE 6: COEFFICIENTS OF PROBIT REGRESSION: PROBABILITY OF SCHOOL ATTENDANCE IN 2005-2006 BY CHILDREN 5-14 YEARS, RURAL SUB SAMPLE

(Dependent variable: Probability of school attendance in 2005-2006; (ε)

	Probit Regression (1)	Probit Regression (2)	Probit Regression (3)	Probit Regression (4)
ψ : Parental education variables				
Father's education in years	.0525**	.05147**	.0507**	.0892**
Sq. of father's education	-.0019**	-.0019**	-.0018**	-.0036**
Mother's education in years	.0366**	.0346**	.0342**	.0782**
Sq. of mother's education	-.0027**	-.0025**	-.0025**	-.0055**
$C(A_B, A_L)$: AAI	.0018**	.0016**	.0017**	.0030**
θ :Public infrastructure index	----	.0268**	.0275**	.0713**
Controls				
Household has BPL card? (1 = has BPL card)	----	----	.0209	.0693**
Number of de jure members	-.0083	-.0080	-.008	-.0205**
Sex of head of household (1 = Male)	.0016	.0035	.0054	.0369
Child of household head? (1 = Yes)	-.0108	-.0079	-.0069	.01512
Sex of child (1 = Male)	.0994**	.1009	.0978**	.1473**
Age of child	-.0876**	-.0877**	-.088**	.1611**
Attended school in 2004-2005? (1= yes)	3.1163**	3.113**	3.113**	----
Pseudo R^2	0.5992	0.5993**	0.5991	0.1640
State dummies included?	Yes	Yes	Yes	Yes

** Significant at α =5%

TABLE 7: ESTIMATED HOURS OF CHILD WORK AND PROBABILITY OF SCHOOL ATTENDANCE

			Prob. Of Child's school attendance		Estimated hours of work per week	
AAI Percentile	Avg. Years of mother's education	Avg. years of father's education	Attended school previous year	Did not attend school previous year	Non household work	Household chores
20th	0.6	2.19	18%	99%	13.91	9.43
Average	2.12	4.66	24%	99%	11.45	8.83
80th	3.06	6.12	27%	99%	10	8.45
100th	6.13	9.2	64%	100%	0	3.45

FIGURE 1

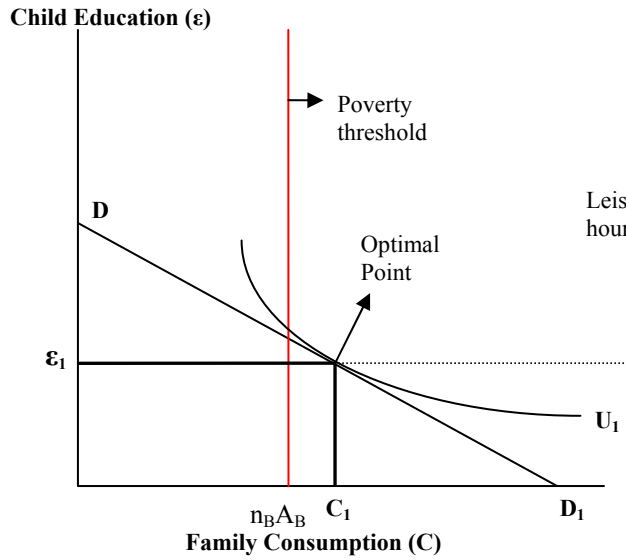

Figure 1(a)

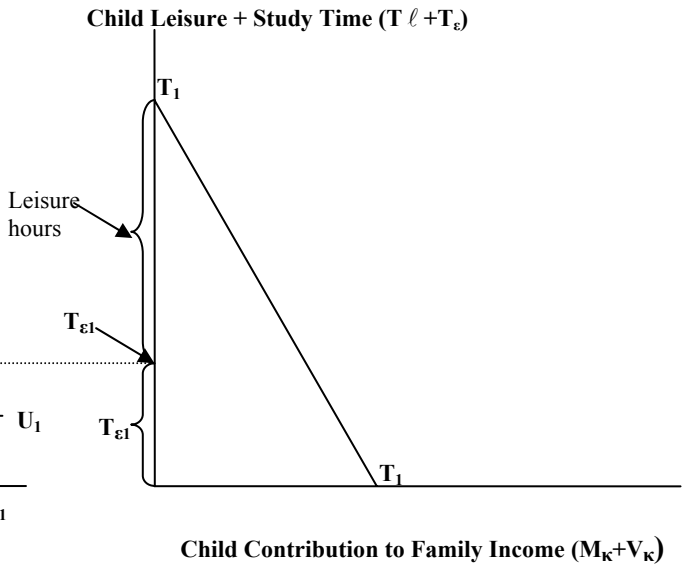

Figure 1(b)

FIGURE 2

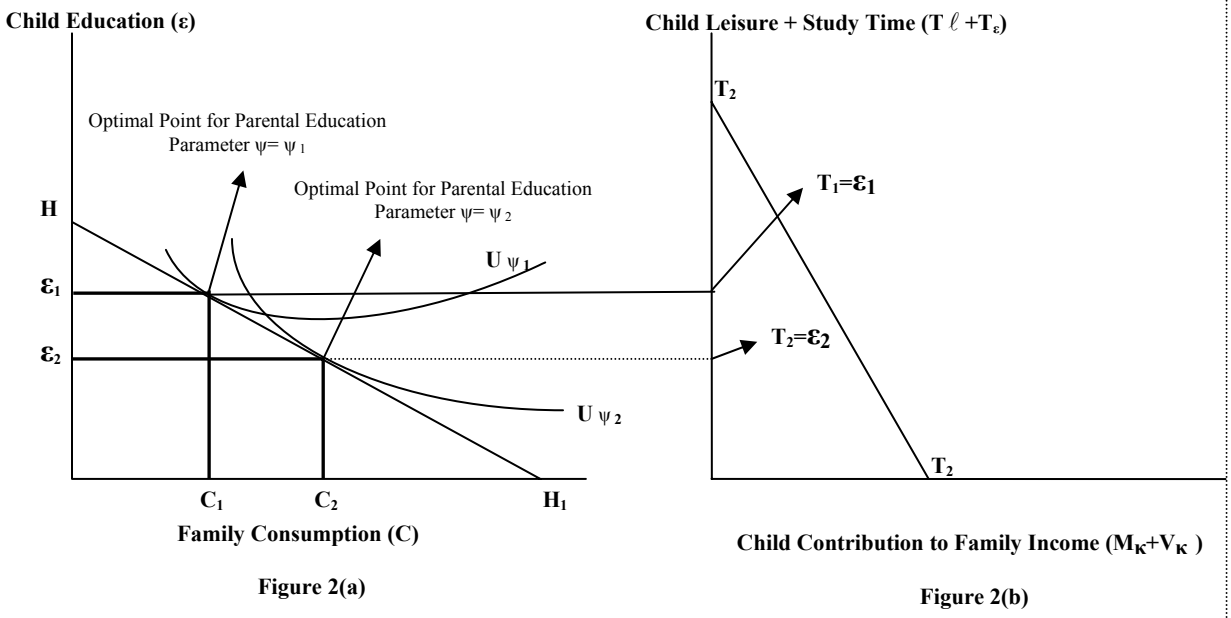

Figure 2(a)

Figure 2(b)

FIGURE 3: THE IDLE CHILD

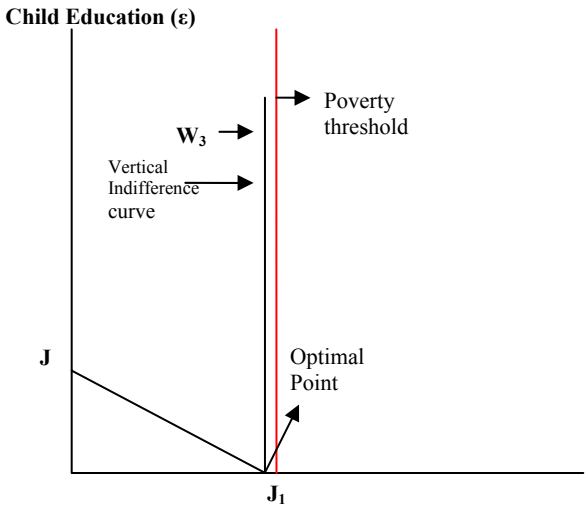

Figure 3(a)

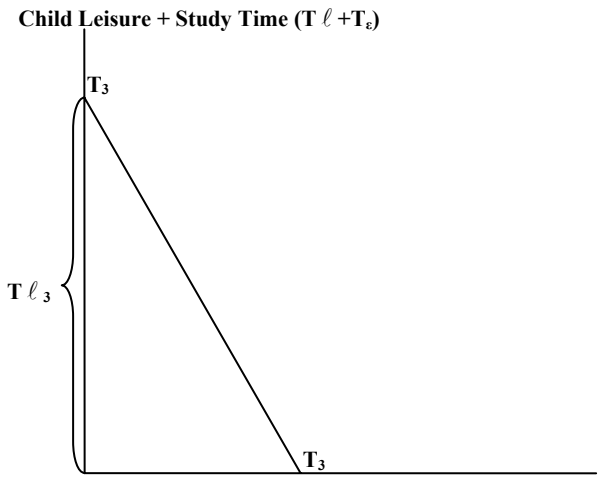

Figure 3(b)

FIGURE 4: THE UNSCHOOLED CHILD WORKER

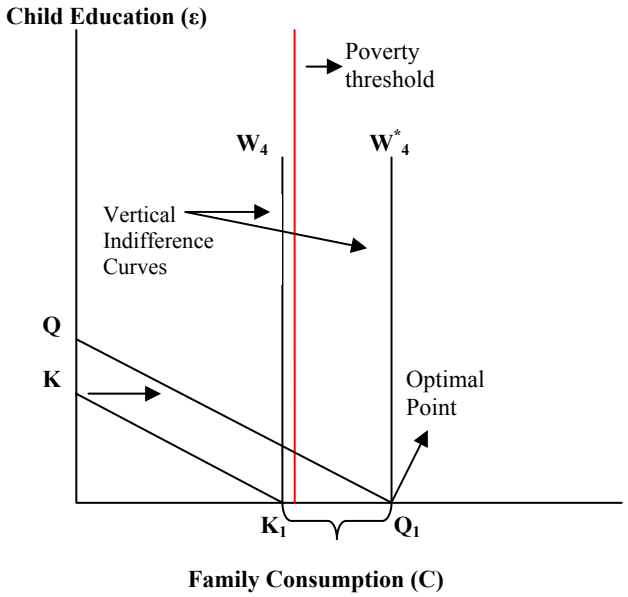

Figure 4(a)

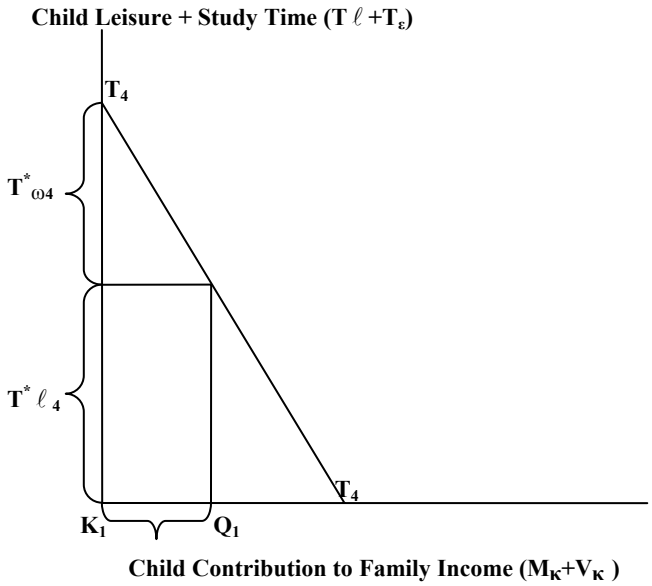

Figure 4(b)

FIGURE 5: THE SCHOOL-GOING CHILD WORKER

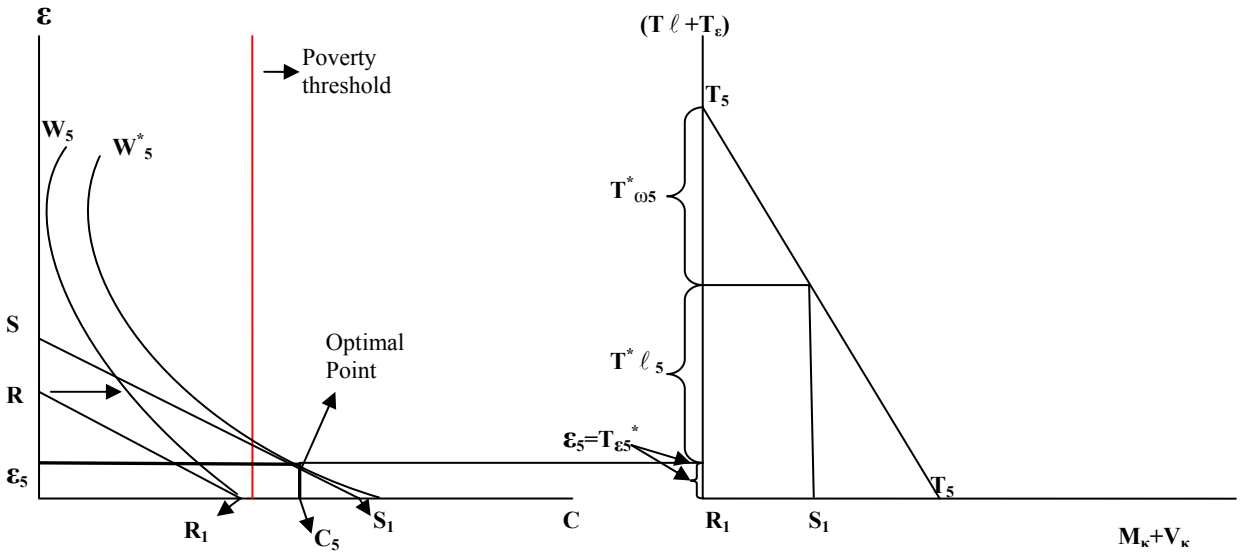

FIG. 6: CUMULATIVE SHARE OF AAI BY CUMULATIVE PERCENTAGE OF RURAL HOUSEHOLDS

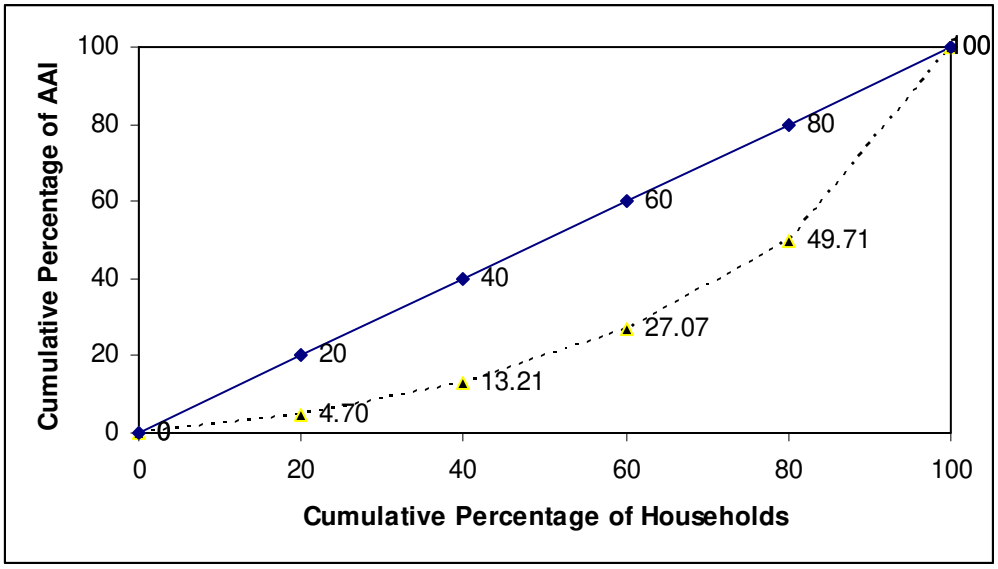

FIG. 7: ESTIMATED IMPACT OF PARENTAL EDUCATION ON HOURS OF NON HOUSEHOLD WORK (AT SAMPLE AVERAGE)

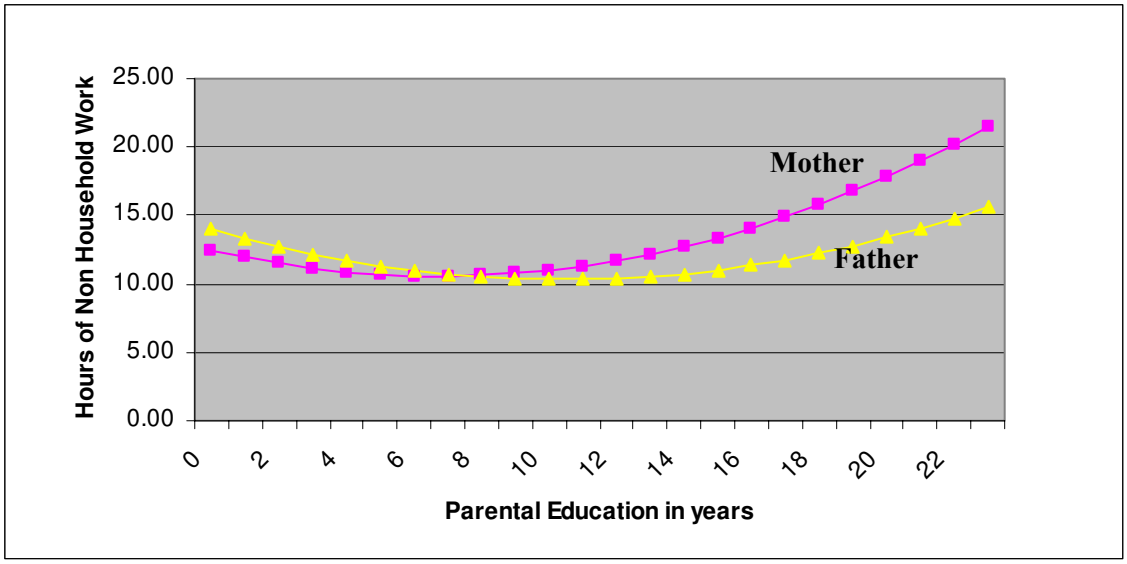

FIG. 8: ESTIMATED IMPACT OF PARENTAL EDUCATION ON HOURS OF HOUSEHOLD CHORES (AT SAMPLE AVERAGE)

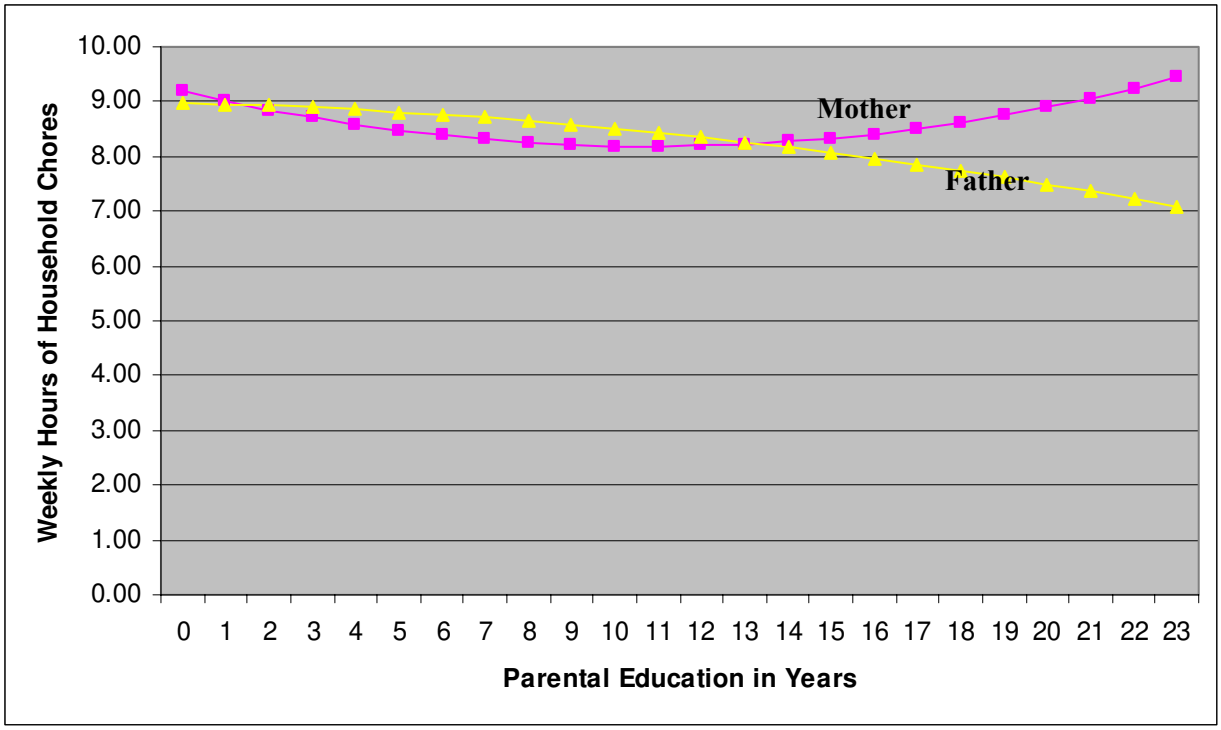

FIG. 9: ESTIMATED IMPACT OF PARENTAL EDUCATION ON PROB. OF SCHOOL ATTENDANCE