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*Participation in Schooling:
Determinants and Learning Outcomes
In Nepal*

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Education and Training Department

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PARTICIPATION IN SCHOOLING:
DETERMINANTS AND LEARNING OUTCOMES IN NEPAL

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December 1985

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Abstract

This paper examines the determinants of adult cognitive competencies and of child school participation in the Terai region of Nepal. Data on three generations from 795 rural farm households were analyzed.

The results of the analysis are: 1) First generation (grandparent) landholdings, literacy and caste status were significant determinants of second generation "innate ability" as measured by the "Ravens Progressive Matrices" (RPM) test. 2) RPM was a significant determinant of second generation schooling. 3) Second generation schooling was a significant determinant of second generation literacy, numeracy, reading comprehension and attitudinal modernity. 4) Attitudinal modernity was a significant determinant of attitude toward school for all households, but not for the subset of households in villages for which school availability data had been obtained. 5) In these latter villages, there was no relationship between school availability and a positive attitude toward school. 6) Third generation child school participation was determined jointly by second generation landholdings, caste, schooling and numeracy, and attitudinal modernity, and the child's sex. 7) Girls were significantly less likely to have completed at least one year of school than were boys. 8) The presence of small children in the household only slightly decreased girls' chances to participate in school. 9) School availability had no effect on child school participation.

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Participation in Schooling: Determinants
and Learning Outcomes in Nepal

There is substantial evidence that suggests that the level of attained adult education is related to such dimensions of development as individual earnings and employment in the urban labor markets,¹ agricultural productivity,² human fertility,³ and health and nutritional status⁴. Nonetheless, there are relatively few empirical studies of the mechanisms underlying these effects. In order better to understand education's effects on these development outcomes, this paper uses data from rural Nepal to examine education's effects on such potentially mediating variables as adult cognitive competencies⁵ and attitudes⁶. A further potentially important consequence of schooling and improved cognitive competence of adults is to increase the desire for schooling for their children, and this paper reports on this and other determinants of school participation as well as its cognitive consequences.

This paper is organized as follows: Section 1 presents background material concerning the determinants of adult cognitive competencies and attitudes and of child school participation; Section 2 describes the data; Section 3 examines the determinants of adult attitudes and cognitive competencies; and Section 4 examines the determinants of child school participation. The fifth section summarizes our conclusions.

1. Background

1.1 Determinants of Adult Cognitive Competencies

There have been numerous and diverse studies attempting to relate school outcomes to variations in the amount or quality of school inputs. The findings of these studies have sometimes been interpreted to imply that schools do not make a difference. Yet there is growing evidence that the number of years spent in school do affect both adult cognitive competencies and adult attitudes, which, in turn, are determinants of child school participation. While these studies provide little guidance concerning how to improve the quality of schooling, they do conclusively show the enduring impact of schooling on various dimensions of cognitive capacity. Relatively few of the available empirical studies of the effects of years of education are from less developed countries, and one purpose of this paper is to use data from Nepal to help fill this gap.

Two recent reviews have summarized most of the relevant literature. Harnqvist⁷ has summarized studies from the U.S. and Sweden, and Sheffield⁸ has summarized studies from a number of low-income countries. The overwhelmingly consistent findings of these studies was that years of schooling affected literacy,⁹ reading and writing,¹⁰ numeracy,¹¹ and modernity.¹²

One important shortcoming of the available literature is that, with data gathered only on adults, it is difficult to ascertain the extent to which an observed correlation between completed schooling and cognitive competence may result in part from the plausible hypothesis that more innately able individuals both attend school longer and would in any case perform better on tests of adult competence. While it is difficult to assess with complete adequacy the extent to which this hypothesis is correct, by including a test of 'ability' along with our other, more achievement-oriented measures, we are in this paper in part able to control for this effect.

1.2 Determinants of School participation

School participation in Nepal is low for all but primary school males, and total enrollment rates for children 9-15 are well below 20% (Table 1). In general, little empirical work on the determinants of school enrollments in less developed countries has been conducted; Birdsall¹³ provides a valuable overview of available evidence. Since near-universal male primary school enrollments are now common (though far from universal), much work has been directed toward explaining female enrollments. Reviewing these studies, Bowman and Anderson¹⁴ cite five major determinants of female enrollments--ethnic and regional differences, caste differences, paternal occupation, paternal education, attitudinal modernity and such miscellaneous factors as foreign travel or language usage. Such factors have also been shown to be related to positive parental attitudes toward schooling for children.

Research on determinants of school participation in Nepal in particular is very limited. Such research as does exist suggests that -- in addition to the factors cited by Bowman and Anderson -- household economic factors, student health and nutritional status,¹⁵ school availability, and school quality and relevance are all important. In the next subsections we discuss the factors commonly believed to affect school participation, with particular reference to conditions in Nepal.

1.2.1 School availability

Lack of school supply could arise either because there is no school within walking distance, because the available schools are overcrowded or because the quality of available schooling is low.

Walking distance. School availability in Nepal has increased dramatically in the past 30 years. In 1951 there were 321 primary schools enrolling less than one percent of eligible children; in 1975 there were 8,708 schools enrolling 59 percent of the children;¹⁶ by 1982 the number of primary schools had risen to 9,404.¹⁷ Since there are large numbers of primary schools in Nepal it would seem that distance to school is not a major problem on the average. There probably is, however, a substantial minority of primary school-age children in rural areas for whom distance to primary school is a problem. At the lower-secondary level there are fewer than a quarter as many schools, and distance to school may be more of a problem. Shrestha¹⁸ reports, however, that while distance to school was related to school participation in Gorkha District, it was reported by parents in Jumla, Dhankuta and Chitawan Districts to be one of the least important reasons for not sending children to school.

Crowding. The average student-to-teacher ratio is low for both primary and secondary levels (nationally only about 32; in the districts examined in this paper, 28 and 30). Thus, overcrowding probably poses no problem for most students at either level.

School quality and relevance. Another important problem for primary and lower-secondary schooling, particularly in rural areas, is the students' lack of access to schooling that is relevant to their lives and of a quality sufficient to make attendance worthwhile. In the relatively few studies of determinants of school-leaving behavior in developing countries, poor quality of teachers has emerged as a principal reason for student's dropping out.¹⁹ School quality affects student dropout propensity both directly and through increasing the incidence of repetition, which itself causes higher dropout rates.

Direct evidence about the quality of learning in Nepal's primary schools is limited. One recent study completed by the Institute of Education,²⁰ however, suggests that the quality of learning is quite low, and reflects the very poor conditions for learning: untrained teachers, insufficient materials, and monotonous teaching methods. Many teachers lack the school-leaving certificate earned after tenth grade graduation, and perhaps only one-third of all teachers have training beyond the tenth grade. Teaching materials are scarce, although the impressive effort now underway to prepare and distribute textbooks and teachers' guides for all subjects at all grade levels may help to improve the situation. Teaching methods are traditional, with classes dominated by teacher lectures and unembellished readings from the textbooks. Students are expected to

respond chorally to the teacher's questions, to recite aloud from their texts and, in general, to memorize. Students are rarely asked to relate the content of their lessons to their own experiences and perceptions, and rarely expected to analyze, synthesize, or consider questions of cause rather than questions of fact. Students are not encouraged to ask questions.²¹

1.2.2 Demand for schooling

Lack of parental demand for education could arise from out-of-pocket costs for schooling, the opportunity cost of student's time, and/or parental attitudes regarding schooling.

Out-of-pocket costs. These include direct tuition expenses and the cost of books. Under Nepal's New Education System Plan, the government finances all of the primary teacher's salary and three-fourths that of a lower-secondary teacher, except in remote areas where all the costs of lower-secondary teachers are borne by the government. It has been estimated that costs to the student for primary education are about Rs.15 per year for copybooks, pencils and examination fees. The addition of school uniforms, estimated to cost Rs.70 each, increases the direct cost of primary school attendance to Rs.90-300 annually. The costs to a lower-secondary student are about Rs.78 for copybooks, pencils, examination fees and books. While students in remote areas will have teacher and book costs somewhat more subsidized than these numbers would indicate, they are far less easily able to afford cash expenditures of these amounts, as total household cash income in rural Nepal is only Rs.1500-Rs.2000 annually.

The out-of-pocket cash expenditures can be expected to be a significant barrier to students' access to schooling, particularly at the lower-secondary level. Shrestha²² found that low family income was the most important reason reported for parents not educating children in the Chitawan District and the next most important reason in the Dhankuta District.

Cost of student's time. At both the primary and lower-secondary levels, the time a rural student spends in school must frequently be at the expense of his or her doing useful work at home.²³ Studies show that the demand for female child labor is higher than the demand for male child labor. Acharya and Bennett²⁴ report that in 8 representative districts in Nepal, girls aged 5-9 work 3.4 hours per day and that girls aged 10-14 work 7.3 hours per day, which is 50% more than boys in the same age groups work. A study of farm households in Kabre Palanchowk found that 25% of girls and 13% of boys aged 6-14 were employed in farm labor.²⁵ A study undertaken in Pokhara, Nepal, reported in Kasaju²⁶ found that:

"Youngsters who do not come to school need to work for their parents, ... need to support their family's economy and ... cannot complete the school because the number of hours they are required to stay at school does not match with the number of hours they can afford to spend. In a study, 'A survey of parental reasons for not sending their children to primary school in Pokhara Town Panchayat Area,' Mr. Upadhyaya has pointed out the need for a child to work in support of the family as one of the most frequently listed reasons for no-enrollment. The most frequently stated reason, states Mr. Upadhyaya, was that the parents did not see any value in educating girls."

This finding is confirmed by Shrestha,²⁷ who reports the primary reason for parents in Jumla, Gorkha and Dhankuta not wishing to educate their children as being a "lack of supporting members for household." That "girls are to be given away in marriage" was found to be the second most frequently mentioned reason for not educating girls in Jumla, Gorkha and Chitawan.

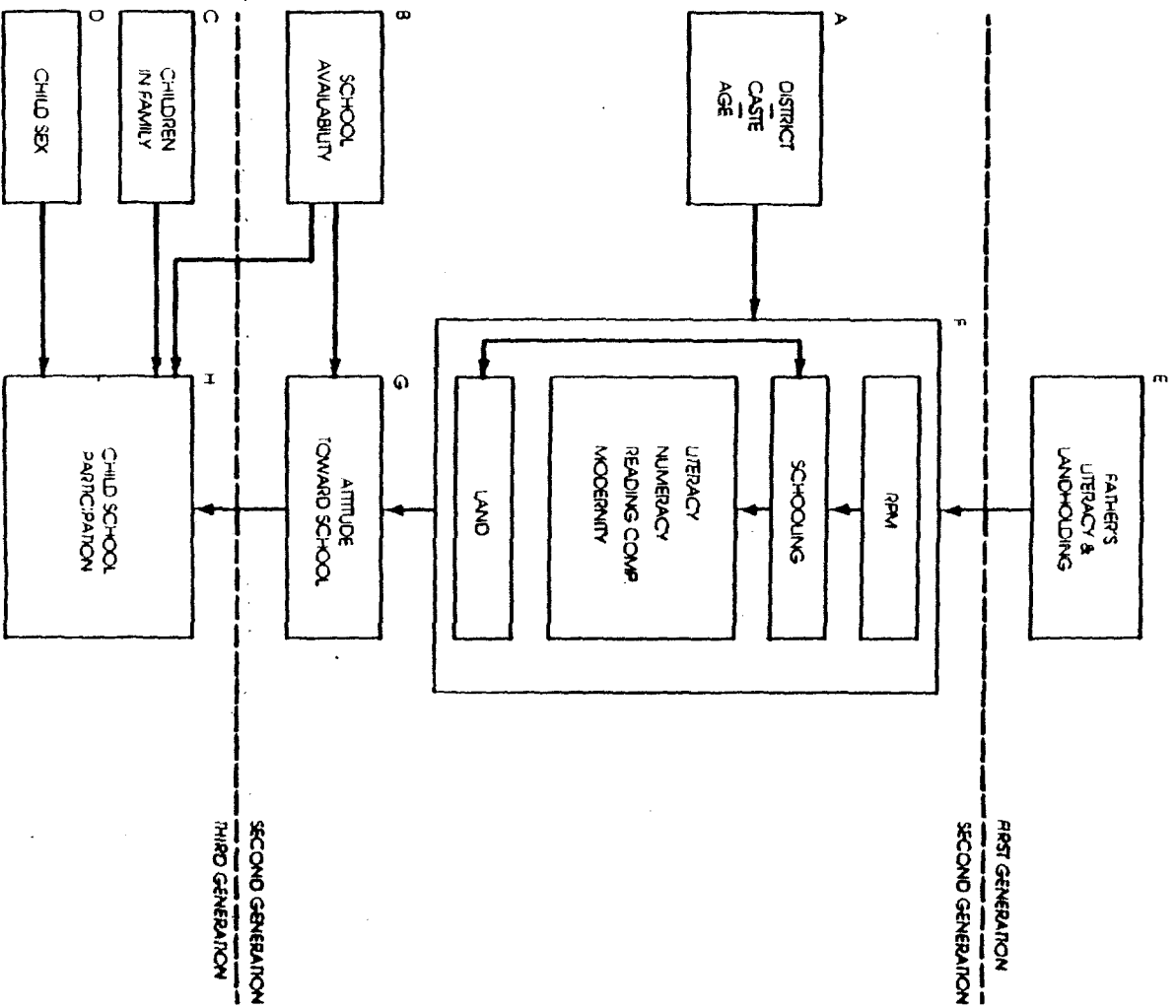
Attitudes. According to Ministry of Education data, in 1977 only approximately 30% of the age cohort of female children were involved in primary schools. Female school enrollment in rural areas has been shown to be related to parental attitudes, particularly parental conservatism.²⁸ The evidence from Shrestha and Upadhyia suggest that parental conservatism may be one factor restricting girls' education in Nepal. A recent study of parental attitudes in Dolkha, Bank and Kathmandu Districts reported that "The general notion of these parents about girls was that girls would not remain an asset to them all along, which implies that higher investment on their education was not warranted from the practical point of view."²⁹

1.3 The Causal Model

In the present paper, we examine the effects of these factors across three generations. Figure 1 illustrates the causal structure. The variables in Boxes A-D are entirely exogenous and are assumed to affect second and third generation variables in Boxes F-H; the variables in Box E—first generation land holding and literacy—are also exogenous, but they are separated to clarify the inter-generational structure of this model. The variables in Box A—district, caste and age—and in Box E are assumed to influence "innate" ability as measured by the Raven's Progressive

EXOGENOUS FACTORS

CROSS-GENERATION FACTORS



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Figure 1

Matrices (RPM) test; this variable, combined with the exogenous variables, is assumed to influence the amount of schooling an individual receives, than the amount of land currently owned by the individual, and finally, the adult cognitive competencies of that individual. All the preceding variables taken together plus the availability of schools (Box B) are assumed to influence adult attitude toward school (Box G). Finally, all these variables, taken in combination with the number of children in the household (Box C) and the child's sex (Box D) are assumed to affect the third generation's school participation.

2. Data

Data for this analysis were obtained from a survey of 795 households studied as part of a World Bank research project examining the effects of education and agricultural extension on rural development. The site chosen for the project was determined by the major research objectives concerning the effects of education on agricultural productivity.

The households to be interviewed were chosen randomly within each of six panchayats in two districts--Bara and Rautahat. A list of owners of all dwellings in each panchayat was obtained from the local rural health workers (these lists had been prepared in connection with the health programs). Then, using a three-digit, random number table obtained from the Nepal Central Bureau of Statistics, households to be interviewed were selected randomly within a panchayat until a 15% sample of households in each panchayat had been chosen (ten extra households per panchayat were chosen for replacement).

The study households were visited three times, first in October-November 1977, next in January-March 1978, and last in April-May 1978. Field workers for the interviewing were recruited by the members of the New ERA research team in Birgunj, Kalaiya (district headquarters of Bara) and Guar (district headquarters of Rautahat). The final field team comprised seven males and seven females, who worked in pairs. All the field workers spoke both Nepali and Bhojpuri; they translated the questions from Nepali (in which the instruments were written) to Bhojpuri in the field. Table 2 shows the calendar of data collection and indicates the overall nature of the data collected.

Information obtained from the study households at one or more of the three field visits includes data on household characteristics, agricultural productivity, fertility, nutritional status and various education measures of household members.

The availability of primary and secondary schools in the sample villages, as well as the distance to primary and secondary schools, was obtained in May 1979. This information was available for 23 of the 28 villages studied.

In this paper, data from three generations are analyzed, with first generation data on literacy and landholdings used to predict second generation cognitive competencies and first and second generation data used to predict third generation school participation. In the former analysis, the record for the head of the household provides the unit of analysis, while in the latter analysis both household and child records serve as units of analysis. A child was defined as a son or daughter of the household head, a nephew or niece of the household head, a grandchild

or great grandchild of the household head, or an adopted child. Younger sibs of the head of the household, aunts or uncles, sisters-in-law, daughters-in-law, servants and unrelated children were excluded. These children are the third generation. Third generation data include a measure of school attendance as a deviation from the average attendance of the child's age cohort and an indicator of the child's sex. The second generation is the child's parent who is the head of the household. Second generation data include information about this household head: the total number of years of schooling completed, a measure of literacy, a measure of numeracy, a measure of basic ability (The Raven's Progressive Matrices (RPM) Test), a measure of attitudinal modernity (a modified version of the short form of the Inkeles Overall Modernity (OM) scale), a measure of desire for schooling of male children, and the household landholdings. The first generation is the head of household's father. First generation data include the literacy and landholdings of the child's paternal grandfather, as attributed to him by the head of household. District of residence and caste status are considered exogenous variables. Those variables analyzed in this paper are described in Table 3; the means, standard deviations and sample size for each variable are given in the sections of this paper in which they are analyzed.

The analyses in this paper are restricted to (a) households with children ages 6-16 and having complete head of household data (N=282); (b) households with children ages 6-16, having complete head of household data sets and residing in villages for which school availability data were obtained (N=213); (c) all heads of households with complete data sets (N=369); (d) all heads of households with complete data sets residing in

villages for whom school availability data were obtained (N=285);
(e) children ages 6-16 residing in households having complete data sets
and residing in villages for whom school availability data was obtained
(N=225).

The determinants of second generation (adult) cognitive
competencies and attitudes will be reported in Section 3 of this paper.
Section 4 will present the results of two analyses of the determinants of
third generation (child) school participation, one conducted at the
household level and one at the individual child level of analysis.

3. Determinants of adult cognitive competencies and attitudes

3.1 Methods of analysis

We have ordered our variables recursively, starting with
background characteristics of the individual and moving sequentially
through the various variables that are explained. In this section we
discuss only Boxes A, B, E, F and G of Figure 1 and analyze data from the
sample of all heads of households, whether or not school age children were
in the household.

We analyzed the data using the ordinary least squares linear
regression of the Statistical Package for the Social Sciences.³⁰ Our
tables show the estimated regression coefficients below which in
parentheses are the F-values indicating the statistical significance of
the estimated coefficient. The means and standard deviations of the
variables used in these analyses are reported in Table 4.

3.2 Results

The results of some of these analyses are presented in
Tables 5-7 which show the estimated determinants of second generation RPM

score, schooling, literacy, reading comprehension, numeracy, attitudinal modernity and attitude toward school. In this section each table will be discussed separately.

Raven's Progressive Matrices (RPM) score. The first column of Table 5 presents the results of a single multiple regression analysis of the effects of first generation landholding, first generation literacy, caste status and district of residence on second generation adult RPM score. This regression shows that first generation landholding and first generation literacy were both significant determinants of second generation RPM scores. It is plausible, of course, that an individual's RPM score is both an outcome of schooling as well as a determinant of schooling as we have modelled the situation. We thus properly have a simultaneous system which we have identified in this case by assuming that the coefficient of schooling on RPM be zero. Though this is at best an approximation, it does have justification in that the intention of the RPM is to measure 'innate' ability and, in our sample, this intention seems to be partially fulfilled in that relative differences between males and females RPM scores are small compared to, say, numeracy scores.³¹

Schooling attainment. The second and third columns of Table 5 report the results of two multiple regression analyses to estimate the determinants of second generation school attainment. These regressions indicate that school attainment was significantly affected by first generation landholding and literacy, as well as by caste status. The effect of "innate" ability as measured by RPM score was also statistically significant, both considered independently (regression coefficient = .317; $F = 96.765$; $r^2 = .207$) and in combination with the exogenous variables.

Overall more schooling was attained by younger persons with more literate and landed fathers from the Brahmin, Rajput and Kayastha castes and with higher "innate" ability, than conversely. Higher-status caste members on the average attained nearly 4.5 more years of school than lower-status caste members; individuals with literate fathers attained nearly 2 more years of schooling than individuals with illiterate fathers; finally, older individuals attained fewer years of schooling than younger individuals.

Adult literacy. Second generation adult literacy was assumed to be a function of background characteristics, "innate" ability and schooling. Although first generation landholding, literacy and caste had significant effects on second generation literacy when assessed independently, these effects operated largely through second generation school attainment (Columns 1 and 2 of Table 6). Likewise the effects of RPM score on literacy were mediated by schooling. Overall, schooling alone accounted for 67% of the variance in second generation adult literacy; the inclusion of various exogenous and first generation factors in the regressions did little to improve the overall estimation.

Adult reading comprehension. Second generation adult reading comprehension was also assumed to be a function of background characteristics, "innate" ability and schooling. Columns 3 and 4 of Table 6 report two of several alternative models of the determinants of second generation reading comprehension. From these regressions we see that the most significant predictor of reading comprehension is school attainment. The effects of both first generation literacy and second generation RPM score, statistically significant when considered independently, disappeared when considered simultaneously with school attainment.

Numeracy. Again, the significant effects of first generation literacy on second generation adult numeracy was through the school attainment of the second generation. Second generation school attainment accounted for 22% of the variance in second generation numeracy, but unlike the models for literacy and reading comprehension, RPM score and age were also significant predictors of numeracy (Columns 5 and 6 of Table 6).

Attitudinal modernity. Columns 7 and 8 of Table 6 show that the significant effects on second generation attitudinal modernity of first generation landholding, first generation literacy and caste remained significant when second generation schooling and RPM score were taken into account. Both second generation school attainment and RPM score were significant determinants of attitudinal modernity, and although the independent effect of each was reduced when both were considered simultaneously, each remained significant predictors of attitudinal modernity.

Attitudes toward schooling. Second generation attitudes regarding third generation schooling were assumed to be determined by both first and second generation characteristics and by school availability. These effects were assessed twice, once on the full sample of household heads and once on the household heads sample from villages for which school availability data were obtained. The results of these analyses are presented in Table 7.

From the first column of Table 7 we see that, for all household heads, first generation literacy and second generation attitudinal modernity were the only factors related to second generation attitude toward schooling. The second column of Table 7 reports the results of this

analysis when it was repeated for the sample of household heads residing in villages from which school availability data were obtained. For this second sample, only landholding was a significant determinant of desire for schooling. This difference suggests that the two samples may not be similar.

Column 3 of Table 7 presents the coefficients for four indicators of school availability--the availability of primary schools in the village, the availability of secondary schools in the village, the distance to primary school and the distance to secondary school. It is evident that school availability was not a factor in determining desire for schooling for this sample.

4. Determinants of School Participation

In this section we analyze the determinants of third generation (child) school attendance. The analysis is conducted first with the data aggregated at the household level and second with the data aggregated at the individual child level. The dependent measures for these analyses differ. At the household level, school participation was operationalized as the proportion of children ages 6-16 who completed at least one year of school (PCE 1); the mean value of this indicator for all households having children ages 6-16 was 19.1%. At the individual level, school participation was operationalized two ways; first as his or her deviation from the age specific mean school attendance for all children in the sample (PCE 2); these means are shown in Table 8 and indicate a low level of school attendance. In a second analysis, a dichotomous indicator of school participation was used as the dependent variable (CS). The means and

standard deviations of the variables used in the following analyses are presented in Table 9.

4.1 Data aggregated at the household level

4.1.1 Method

Once again we have ordered our variables recursively. Referring back to Figure 1, the variables in Boxes A, E and B--school availability--are entirely exogenous and are assumed to affect the variables in Boxes F--second generation cognitive competencies and attitudes--and G--second generation attitude toward school--both separately and in combination. These variables taken together with the number of children in the family and the child's sex are assumed to affect third generation school participation. These data were also analyzed using the SPSS ordinary least squares regression.

4.1.2 Results

Because of the very low rates of enrollment in our sample, household school participation by children was operationalized as the percent of children in the household, ages 6-16, who completed any year of school. This measure provided overall statistics not dissimilar to national statistics for these districts (Table 10).

Household determinants. As the first column of Table 11 indicates, household children's school participation was determined by the household wealth (as indicated by household landholdings), the schooling attained by household head, the numeracy of the household head, the years of schooling of the household head, the RPM score of the household head, the attitudinal modernity of the household head, the caste of the household and the percent

female children. With the exception of percent female children, these effects were positive.

To examine the question of whether rates of female participation in school were affected by the presence of young children in the household, we constructed the interaction term PGC, or percent girls in household multiplied by the number of children 0-6 years of age. Introducing this term (which had a statistically significant coefficient = $-.088$, $F = 4.136$) into the regression dramatically reduced the effect of the percent girls in the household on children's school participation, while increasing to statistical significance the effects of children aged 0-6 (coefficient = 5.518 , $F = 4.570$). From this we concluded that girls were being utilized in the household to care for smaller children, rather than being encouraged to attend school.

The effects of the household heads' spouses cognitive abilities and modern attitudes were estimated in separate equations. These effects were limited to a positive effect of spouses' RPM score on children's school participation; spouses' modernity was not related to children's school participation.

Attitude toward school effect. The second column of Table 11 reports the effects on school participation of entering the respondent's attitude toward schooling into the regression. For heads of households (but not for spouses) attitude toward schooling was worth approximately five percent increased enrollment for each additional level of desired schooling beyond the primary level. Holding attitude toward school constant did little to change the relative impact of other household characteristics on household children's school participation.

School availability effect. Two indicators of school availability were used in this analysis: presence or absence of a primary or lower secondary school in the village, and the distance to a primary or lower secondary school that served the village, should none be available in the village. As the third column of Table 11 indicates, holding household characteristics constant, neither primary nor secondary school availability was found to have a statistically significant effect on children's school participation, though the direction of the observed effect was generally what would be expected. We note, however, that school availability for this sample may be atypical for Nepal as a whole, insofar as 68% of the households were located in villages reported to have primary schools and 20% were located in villages with lower secondary schools. The average distance to primary school was, furthermore, only .26 kosh, or about one-quarter mile.

Household characteristics, attitude toward school, and school availability. As the last column of Table 11 indicates, when household characteristics, attitude toward school and school availability were considered simultaneously, the head of household's cognitive abilities and attitudes continued to affect children's school participation, as did the attitude toward schooling. School availability had no effect independent of attitude toward school.

For comparison purposes, it is interesting to note that being in a high caste group--a totally exogenous variable--was worth 36% more children's school participation, while being numerate--a potentially determined variable--was worth 23% for a perfect test, or 1.6% for each correct answer. Being modern was worth 2.5% more children enrolled for

each modern response. A positive attitude toward schooling was worth 4.3% more children enrolled for each level of schooling beyond primary desired. Assuming that each household with children had four school-aged children, two of which were females, each girl was worth 3.8% fewer children enrolled; if all the school-aged children were female, 15% fewer children participated in schooling. If primary school availability were a statistically significant factor--which it was not--a school in the village would be worth only 1.4% more children enrolled.

4.2 Data aggregated at the child level

4.2.1 Method

Determinants of third generation school participation were identified as a combination of fixed background characteristics, first generation factors, second generation factors including a stated desire for third generation schooling, and school availability. The determinants of school participation at the child level of analysis were estimated in two ways; first using an ordinary least squares linear multiple regression approach with school participation expressed as a continuous variable, and second using a logistic regression with school participation expressed as a dichotomous indicator. For the first analysis, the dependent variable was the child's deviation from the mean years of schooling completed by his or her age cohort.

4.2.2 Results of the linear multiple regression analyses

Sixty-two different equations testing alternative specifications for the determinants of the child's school participation were estimated.

In general, first and second generation factors explained about 16% of the variance in third generation school participation, while third generation sex explained an additional four percent of the variance. Table 12 reports several of the more interesting specifications.

First generation effects. The first column in Table 12 presents the coefficients for the effects on third generation school participation of first generation literacy and landholding, holding constant caste, district of residence and child sex. Although caste is fixed, and may be considered exogenous, it is important to note that members of higher castes are substantially more likely to send their children to school; caste alone accounted for 5.1% of the variance in school attendance. First generation literacy accounted for 5.8% of the variance in third general school participation, while first generation landholding accounted for another 3.5% of the variance.

Second generation effects. The second column in Table 12 presents the coefficients for the effects on third generation school participation of first generation landholdings and literacy; second generation RPM score, school attainment, cognitive competencies, landholdings, attitudinal modernity, and fixed background characteristics. In column three, the child's sex is also included. The most significant determinant of third generation school participation was the sex of the child, boys receiving on the average three quarters of a year more schooling than girls. While both second generation RPM score and attitude toward school were significant determinants of third generation school participation, the effects of attitude toward school were markedly reduced

when the sex of the child was included in the specification, suggesting that this attitude did not generalize to daughter's schooling and was restricted to attitudes towards son's schooling.

Effects of school availability. Column 4 of Table 12 presents the results for the effects of school availability on child school participation, for the subsample of children for whom school availability data were obtained. Holding other variables constant, neither the presence or absence of either primary or secondary schools in the village, nor the distance to these schools had any effect on child's school participation.

4.2.3 Logistic regression analysis

For this analysis, the dependent variable (CS) was a dichotomous indicator of whether or not the child had obtained any schooling. The means and standard deviations of selected variables, by child schooling status, is presented in Table 13. Several dozen logistic regressions were run; Table 14 reports the results of some of the more interesting ones.

First generation effects. As was noted in the linear multiple regressions, the first column of Table 14 indicates that caste was a statistically significant predictor of child school participation, with members of higher castes being twice as likely to attend school than members of lower castes. Neither first generation literacy nor first generation landholdings were significant predictors of third generation school participation.

Second generation effects. With first generation and exogenous variables held constant, the second column of Table 14 indicates that parental schooling and modern attitudes were strongly related to child

school participation; parental attitudes toward school were not related to child school participation in this analysis.

Other exogenous effects. Columns 3-4 of Table 14 report the effects of two other exogenous factors on child school participation: child sex and school availability. Two variables related to child sex were created. The first, SEXC, was an indicator that the child was female in a household having other children ages 0-6 years; the second, SEXO, was an indicator that the child was a female in a household with no other small children present.

In Columns 3 and 4 of Table 14 we see that the effect of being female was consistently negative, with girls three and one half to four and one half times less likely to attend school than boys. Small children in the household decreased the girls likelihood of attending school, but all girls were less likely to attend school than were boys.

Two variables related to the availability of schools were created; these were similar to those used in the linear multiple regression. The first was whether or not a primary school was available in the village and the second was, if no primary school were available, the distance to the nearest school. In this analysis, availability of a primary school in the village was not related to school participation.

5. Summary and conclusions

This paper has examined the determinants of adult cognitive competencies and of child school participation in the Terai region of Nepal. Data on three generations from 795 rural farm households were analyzed. Four analyses were conducted: a linear multiple regression analysis of the determinants of adult cognitive competencies and attitudes,

a linear multiple regression analysis of the determinants of household child school participation, a linear multiple regression of the determinants of individual child school participation, and a logistic regression of the determinants of child school participation.

The result of these various analyses are highly consistent and may be summarized as follows:

1. First generation (grandparent) landholdings, literacy and caste status were significant determinants of second generation "innate ability" as measured by the Ravens Progressive Matrices (RPM) test.
2. RPM was a significant determinant of second generation schooling.
3. Second generation schooling was a significant determinant of second generation literacy, numeracy, reading comprehension and attitudinal modernity.
4. Attitudinal modernity was a significant determinant of attitude toward school for all households, but not for the subset of households in villages for which school availability data had been obtained.
5. In these latter villages, there was no relationship between school availability and a positive attitude toward school; only household landholding was a determinant of attitude towards school.
6. Third generation child school participation was determined jointly by second generation landholdings, caste, schooling and numeracy, and attitudinal modernity, and by the child's sex.
7. Girls were significantly less likely to have completed at least one year of school than were boys.

8. The presence of small children in the household only slightly decreased girls' chances to participate in school.

9. School availability had no effect on child school participation.

Data from the same households shed light on two other important determinants and outcomes of school. Mook and Leslie³² found that child nutritional status was positively and significantly related to male and female school enrollment and to male grade attainment. Jamison and Mook³³ found that grade attainment and numeracy improved the efficiency of rural farmers by economically meaningful amounts.

A completely parallel study conducted at the same time in Thailand³⁴ found generally similar results, with only one or two exceptions, most notably that schooling and ability affected parental aspirations for children's schooling.

Table 1

School Attendance in Nepal by Sex and School Levels

	School Level		
	Primary	Lower Secondary	Secondary
Age of students	6-8 yrs.	9-12 yrs.	13-15 yrs.
Total population	1,096,548	1,331,035	771,698
Estimated female	548,274 (50%)	665,512 (50%)	385,849 (50%)
Estimated male	548,274 (50%)	665,512 (50%)	385,849 (50%)
Total enrolled	769,049	226,639	82,158
Female enrolled	169,640 (22%)	41,788 (18%)	13,598 (17%)
Male enrolled	599,409 (78%)	184,851 (82%)	68,560 (83%)
Total enrollment rate	70%	17%	10%
Female enrollment rate	31%	6%	4%
Male enrollment rate	108%	28%	17%

a Computed from Nepal: Primary education--a subsector study, Report No.

135, UNESCO, Paris, October 1978, Annex 1 and Annex 2.

Table 2

Data Collection Information

<u>Round 1</u> (10-11/77)	<u>Round 2</u> (1-3/78)	<u>Round 3</u> (4-5/78)
1. Household roster	1. Household roster (married)	1. Children health and nutrition status revised
2. Household information (including assets, health, and non-farm income)	2. Education information for members of household only (literacy, numeracy, modernity, Raven's Progressive Matrices)	
3. Children's nutritional and health status	3. Background, employment, and marital status of members of household over 14	
4. Fertility questions for married women, part of Rautahat	4. Health, nutrition, and family planning knowledge and attitudes	
	5. Fertility questions in married women, part of Rautahat and all of Bara	

Table 3

Description of Variables

Variable Name	Variable Description
DIST	District indicator: 1 = Bara; 0 = Rautahat
FLAND	Total land held by head of household's father, in Bighas: 1 Bigha = 0.676 hectares
FLIT	Indicator of head of household's father's literacy: 1 = literate; 0 = not literate
CI	Caste indicator: 1 = head of household a member of one of the upper castes of Terai origin (e.g., Brahmin, Rajput, Kayastha); 0 = head of household member of other caste
AGE	Age of head of household, in years
RPM	Head of household's score on Raven's Progressive Matrices Test (range = 0 to 36)
SYRS	Schooling of head of household, in years of school completed
HHLIT	Indicator of literacy of head of household: 1 = literate, 0 = not literate
HHNUM	Numeracy score of head of household, as proportion correct of 14 items
HHCOMP	Reading comprehension score of head of household (range = 0 to 3)
MOD	Head of household's modernity score (range = 9 to 18)
SD	Amount of schooling desired for boys in household: 0 = will not educate child; 1 = as long as child wants; 2 = up to high school; 3 = up to intermediate; 4 = up to graduation; 5 = beyond graduation

Table 3 (Cont'd)

Description of Variables

Variable Name	Variable Description
LAND	Total land owned, in Bighas (1 Bigha = 0.676 hectares)
PG616	Percent female of school age (6 to 16 years) children in household
C06	Number of children 0-6 years in household
PGC	Interaction term: PG616 x C06
SEX	Sex indicator: 1 = male, 0 = female
SEXO	Sex indicator: 1 = female children in households with no other children ages 0-6; 0 = other
SEXC	Indicator: 1 = female children in households with other children ages 0-6; 0 = other
SAP	School indicator: 1 = primary school available in village; 0 = no primary school in village
SAS	School indicator: 1 = lower secondary school available in village; 0 = no lower secondary school in village
DISP	Distance to primary school (0 kosh; 0.5 kosh; 1.0 kosh)
DISS	Distance to secondary school (0 kosh; 0.5 kosh; 1.0 kosh)
PCE1	Percent of school age children (6-16) in household having completed at least one year of school
PCE2	Child's school participation as a deviation from the mean years of school completed for his or her age cohort
CS	Schooling indicator: 1 = child completed at least one year of school; 0 = other

Table 4

Means, Standard Deviations and Sample Sizes of Variables
Analyzed in Section 3

Variables	All heads of households (N = 369)		Heads of households in villages with schools (N = 285)	
	Mean	S.D.	Mean	S.D.
District (DIST)	0.523	0.500	0.632	0.483
Father literate (FLIT)	0.117	0.321	0.112	0.316
Father land (FLAND)	4.414	8.191	4.016	6.186
Caste (Cl)	0.022	0.146	0.021	0.144
Schooling (SYRS)	1.390	2.990	1.435	3.122
Numeracy (HHNUM)	0.672	0.226	0.673	0.229
Reading comp (HHCOMP)	0.724	1.565	0.765	1.605
Raven's score (RPM)	13.453	4.307	13.491	4.233
Modernity (MOD)	13.621	1.774	13.520	1.728
Land (LAND)	1.913	2.977	1.841	2.491
Age (AGE)	41.713	12.342	41.663	12.139
Attitude toward school (SD)	2.328	1.090	2.291	1.073
Primary school (SAP)			0.653	0.477
Secondary school (SAS)			1.790	0.408
Distance to primary school (DISP)			0.279	0.409
Distance to secondary school (DISS)			0.798	0.568

Table 5

Determinants of Adult "Ability" (RPM) and Schooling (SYRS).
(F-statistic in parentheses)

Independent Variables	Dependent Variables		
	RPM	SYRS	SYRS
FLAND	0.100 *** (13.959)	.092*** (29.753)	.082 *** (27.138)
FLIT	2.796 *** (16.355)	2.780*** (40.724)	1.963*** (23.316)
C1	3.754 ** (6.618)	4.989*** (29.430)	4.477*** (28.136)
DIST	0.984 * (5.485)	0.476 (3.236)	.283 (1.366)
RPM			.204 *** (46.108)
AGE			.055 *** (30.877)
C	12.089	0.302	0.091
R2	0.140	.291	.419
Adj. R ²	0.130	.283	.409
N	369	369	369

* p < .05

** p < .01

*** p < .001

Table 6

Determinants of Adult Literacy (HHLIT), Reading Comprehension (HHCOMP)
 Numeracy (HHNUM) and Attitudinal Modernity (MOD).
 (F-Statistic in parentheses)

Independent Variable	Dependent Variable							
	HHLIT	HHLIT	HHCOMP	HHCOMP	HHNUM	HHNUM	MOD	MOD
FLAND		.002 (1.464)		-0.006 (0.696)		-.001 (0.693)		0.025* (5.379)
FLIT		.030 (0.447)		0.196 (1.011)		.047 (1.763)		0.865*** (9.459)
C1		.053 (0.337)		0.468 (1.319)		.032 (0.190)		1.594*** (7.359)
DIST		.020 (0.602)		0.089 (0.625)		.013 (0.415)		-0.683*** (17.612)
AGE		.001 (0.369)		-0.005 (1.281)		-.003*** (12.997)		-0.021*** (9.184)
SYRS	.116*** (758.337)	.113*** (417.409)	.383*** (422.185)	0.373*** (232.472)	.036*** (105.244)	.025*** (31.966)	0.222*** (60.057)	0.096*** (7.440)
RPM		-.001 (0.169)		-0.008 (0.303)		.010*** (12.725)		0.040 (3.573)
C	.069	.040	.191	.488	0.622	0.630	13.312	13.922
R ²	.674	.677	.535	.542	.223	.281	.141	.258
Adj. R ²	.673	.671	.534	.533	.221	.267	.138	.244
N	369	369	369	369	369	369	369	369

* p < .05

** p < .01

*** p < .001

Table 7

Determinants of Second Generation Desire for Third Generation Schooling.
(F-statistics in parentheses)

Independent Variables	Alternative Specifications		
	(1)	(2)	(3)
DIST	0.000 (0.000)	0.093 (0.527)	0.046 (0.094)
FLAND	0.006 (0.382)	0.016 (1.601)	0.016 (1.476)
FLIT	0.501*** (6.673)	0.403 (3.132)	0.409 (3.179)
CI	0.089 (0.049)	-0.223 (0.226)	-0.262 (0.307)
SYRS	-0.045 (2.115)	0.018 (0.235)	0.017 (0.214)
HHNUM	0.224 (0.573)	0.221 (0.456)	0.199 (0.363)
HHCOM	-0.021 (0.168)	-0.044 (0.612)	-0.041 (0.505)
RAVENS	0.002 (0.015)	-0.009 (0.300)	-0.008 (0.209)
MOD	0.072* (3.852)	0.062 (1.996)	0.070 (2.483)
LAND	0.003 (0.018)	0.082*** (7.473)	0.081*** (7.184)
AGE	0.004 (0.598)	0.002 (0.089)	0.002 (0.100)
SAP			0.459 (1.412)
SAS			0.210 (0.802)
DISP			0.385 (0.713)
DISS			-0.087 (0.251)
C	0.876	1.065	0.261
R2	.109	.136	.143
R2	.081	.102	.095
N	369	285	285

* $p < .05$

** $p < .01$

*** $p < .001$

Table 8

Average Years of School
Attended by Age Cohort

Age Cohort	Average Years of School Attended
6 years old	0.179
7 years old	0.273
8 years old	0.455
9 years old	0.471
10 years old	0.616
11 years old	1.621
12 years old	1.086
13 years old	1.133
14 years old	2.154
15 years old	2.292
16 years old	1.125

Table 9

Means, Standard Deviations and Sample Sizes of Variables
Analyzed in Section 4

Variables	All children (N = 443)		Children in villages with schools (N = 335)	
	Mean	S.D.	Mean	S.D.
District (DIST)	0.533	0.500	0.648	0.478
Grandfather literate (FLIT)	0.102	0.302	0.090	0.286
Grandfather land (FLAND)	4.504	8.777	3.609	4.073
Caste (CI)	0.029	0.169	0.030	0.170
Father's schooling (SYRS)	1.519	3.036	1.591	3.206
Father's numeracy (HHNUM)	0.680	0.239	0.681	0.243
Father's reading				1.735
comprehension (HHCOMP)	0.847	1.662	0.925	
Father's Ravens (RPM)	13.402	4.237	13.481	4.304
Father's Modernity (MOD)	13.529	1.697	13.548	1.679
Father's land (LAND)	2.213	3.488	1.936	1.985
Father's age (AGE)	43.713	10.779	43.713	10.752
Father's attitude toward				
school (SD)	2.139	1.112	2.128	1.110
Deviation from age mean				1.707
school (PCE 2)	-0.075	1.699	-0.088	
Child Sex	0.601	0.490	0.585	0.493
Primary school (SAP)			0.633	0.483
Secondary school (SAS)			0.203	0.403
Distance to primary school (DISP)			0.300	0.421
Distance to secondary school (DISS)			0.778	0.544

Table 10

School Attendance in Bara and Rautahat Districts, Comparing Nepal
Ministry of Education Data with New Era/World Bank Survey Data

	School level		
	Primary	Lower Secondary	Secondary
Age of Students	6-8	9-12	13-15
<u>Ministry of Education</u>			
Total population in Bara and Rautahat	52,627	26,679	24,186
Estimated female	26,314	13,339	12,093
Estimated male	26,314	13,339	12,093
Total enrolled	19,152	4,826	1,872
Female enrolled	2,948 (15%)	480 (10%)	148 (8%)
Male enrolled	16,204 (85%)	4,346 (90%)	1,724 (92%)
Total enrollment rate	36.4%	18.1%	7.7%
Female enrollment rate	11.2%	3.6%	1.2%
Male enrollment rate	61.5%	32.6%	14.3%
<u>New Era/World Bank</u>			
Sample in Bara and Rautahat ^a	355	417	225
Female sample	157	170	109
Male sample	198	247	116
Sample completed some school	42	74	44
Female	7 (16.7%)	9 (12%)	8 (18.2%)
Male	35 (83.3%)	66 (88.0%)	36 (81.8%)
Female one year completion	2.2%	2.2%	3.6%
Male one year completion	9.9%	15.8%	16.0%

^a All children in household, by ages 6-8, 9-12, 13-16.

Table 11

Household Characteristics, Second Generation Cognitive Competencies, Attitudes and School Availability as Determinants of Third Generation School Participation. Dependent variable is percent of school age children in household having completed at least one year of school (PCEI). (F-statistics in parentheses)

Independent Variables	Alternative Specifications			
	(1)	(2)	(3)	(4)
DIST	4.178 (1.524)	3.492 (1.134)	4.749 (1.461)	3.231 (0.521)
LAND	1.679** (8.602)	1.683*** (9.157)	2.773 ** (8.440)	2.263 * (5.489)
AGE	0.237 (2.272)	0.173 (1.281)	0.209 (1.383)	0.192 (1.145)
SYRS	1.748* (5.653)	1.343 (3.511)	1.348 (2.610)	1.352 (2.557)
HHNUM	21.777* (6.534)	21.958** (7.105)	22.256 * (5.351)	23.160* (5.876)
RPM	1.054* (5.533)	1.086* (6.276)	1.112 * (4.886)	1.131* (5.122)
MOD	3.358 *** (10.143)	2.558 * (6.029)	3.192 * (6.540)	2.529* (3.992)
CL	33.607*** (10.454)	33.753*** (11.122)	33.661 ** (9.298)	36.017 ** (10.685)
PG616	-0.224*** (28.951)	-0.128* (3.927)	-0.141 (3.618)	-0.154* (4.323)
CO6	1.732 (0.927)	6.073* (5.838)	3.583 (1.536)	4.166 (2.100)
PGC		-0.097* (5.390)	-0.067 (1.828)	-0.070 (2.005)
SD		6.069 *** (16.55)		4.303* (6.226)
SAP				1.437 (0.114)
SAS				-2.145 (0.142)
C	-67.982	-71.986	-71.174	-70.783
R ²	0.411	0.454	0.435	0.454
Adj. R ²	0.390	0.430	0.404	0.415
N	282	282	212	212

* p < .05

** p < .01

*** p < .001

Table 12

Determinants of Third Generation School Participation.
 Dependent variable is child's deviation from age cohort mean
 school attendance (PCE 2).
 (F in parentheses)

Independent Variables	Alternative Specifications			
	(1)	(2)	(3)	(4)
DIST	.411** (7.863)	.249 (2.887)	0.222 (2.293)	0.022 (0.012)
FLAND	.032*** (13.801)	-.003 (0.030)	-0.002 (0.013)	0.043 (3.277)
FLIT	.837*** (10.647)	0.465 (3.259)	0.426 (2.734)	0.206 (0.383)
CI	2.277*** (26.027)	1.366** (8.412)	1.315** (7.839)	1.420* (5.442)
SYRS		0.057 (2.061)	0.061 (2.383)	0.046 (0.880)
HHNUM		0.799** (5.051)	0.665 (3.425)	0.474 (1.240)
HHCOMP		0.011 (0.032)	-0.002 (0.001)	0.042 (0.343)
RAVENS		0.049** (5.916)	0.051** (6.360)	0.049* (4.145)
MOD		0.066 (1.790)	0.053 (1.145)	0.083 (1.719)
LAND		0.064 (2.986)	0.065 (3.057)	0.061 (1.484)
AGE		0.011 (2.672)	0.010 (2.164)	0.010 (1.222)
SD		0.736*** (25.384)	0.142* (4.477)	0.051 (0.386)
SEX	.687*** (21.098)		0.773*** (27.864)	0.757*** (19.128)
SAP				-0.484 (0.809)
SAS				0.045 (0.020)
DISP				-0.765 (1.492)
DISS				0.280 (1.308)
C	-1.003	-3.559	-3.570	-3.291
R ²	.197	.275	.282	.291
Adj. R ²	.188	.255	.261	.253
N	443	433	433	335

* $p < .05$
 ** $p < .01$
 *** $p < .001$

Table 13

Means and Standard Deviations of Selected Variables,
by School Attendance Status of Child

Variables	School Attendees (N = 69)		School Non-Attendees (N = 361)	
	Mean	S.D.	Mean	S.D.
Exogenous				
District	0.652	0.480	0.507	0.501
Caste	0.159	0.369	0.006	0.074
First generation factors				
Literacy	0.275	0.450	0.064	0.245
Landholding	9.969	17.800	3.273	4.531
Second generation factors				
Age	43.768	11.661	43.859	10.672
Years of schooling	4.449	4.**0	0.920	2.259
Literacy	0.638	0.484	0.194	0.396
Comprehension	1.957	1.818	0.612	1.522
Numeracy	0.853	0.186	0.647	0.232
Raven's Progressive Matrices	17.087	5.575	12.665	3.536
Landholding	4.597	6.947	1.752	2.104
Modernity	14.764	2.167	13.278	1.461
Attitude toward schooling	2.667	1.421	2.022	1.005
Child factors				
Sex - % male	0.899	0.304	0.529	0.500

Table 14

Logistic Regression Estimates of the Determinants
of Third Generation School Participation.
Dependent variable is dichotomous indicator of child schooling (CS).
(t-statistic in parentheses)

Independent Variables	Alternative specifications			
	(1)	(2)	(3)	(4)
DIST	-1.345*** (-6.653)	0.478 (1.155)	0.655 (1.334)	0.664 (1.357)
FLIT	0.488 (1.034)	0.678 (1.241)	-0.057 (-0.078)	-0.106 (-0.145)
FLAND	-0.030 (-0.974)	0.111** (2.810)	0.079 (1.618)	0.097 (1.932)
CI	2.405** (2.757)	1.333 (1.067)	2.917* (2.073)	2.647 (1.889)
AGE		-0.026 (-1.722)	-0.016 (-0.850)	-0.015 (-0.853)
SYRS		0.231** (2.962)	0.281** (2.778)	-0.275** (2.758)
HHNUM		0.311 (0.308)	1.163 (1.033)	1.091 (0.979)
RAVENS		0.036 (0.787)	0.030 (0.558)	0.026 (0.486)
LAND		0.039 (0.451)	0.189 (1.698)	0.174 (1.573)
MOD		-0.211** (-2.611)	-0.311** (-3.018)	-0.303** (-2.952)
HHCOMP		-0.065 (-0.558)	0.140 (0.929)	0.136 (0.912)
SD		0.124 (0.823)	0.485* (2.453)	0.434* (2.221)
SEXC			-4.881*** (-4.872)	-4.776*** (-4.773)
SEXO			-3.415** (-2.623)	-3.451** (-2.651)
SAP			-0.254 (-0.576)	
DISP				-0.363 (-0.654)
N	326	326	326	326
Log Likelihood at conver- gence	-181.9	-118.9	-89.57	86.51
Likelihood ratio	88.04	214.1	278.8	278.9
DF	322	314	311	311

* $p < .05$ ** $p < .01$ *** $p < .001$

Footnotes

1. George Psacharopoulos, "Returns to education: An updated international comparison", Comparative Education, 1981, 17, 321-341.
2. Marlaine E. Lockheed, Dean T. Jamison & Lawrence J. Lau, "Farmer education and farm efficiency: A survey", Economic Development and Cultural Change, 1980, 29, 37-76.
3. Susan Cochrane, Education and fertility: What do we really know? (Baltimore, MD, John Hopkins University Press, 1978).
4. Susan H. Cochrane, Joanne Leslie & Donal J. O'Hara, "Parental Education and Child Health: Intracountry Evidence", Health Policy and Education, 1982, 2, 213-250.
5. J.R. Sheffield, "Retention of literacy and basic skills: A review of the literature" (Paper prepared for the Education Department of the World Bank, 1975).
6. Alex Inkeles and David H. Smith, Becoming modern (Cambridge, Mass.: Harvard University Press, 1974).
7. Kjell Harnqvist, "Enduring effects of schooling--a neglected area in educational research", Educational Researcher, 1977, 6(1) 5-11.
8. Sheffield, Op. Cit.
9. Jennifer Noesjirwan, "Permanency of literacy in Indonesia", American Educational Research Journal, 1974, 1 93-99; George Psacharopoulos; Everett M. Rogers & L. Svenning, Modernization among peasants (New York: Holt, Rinehart and Winston, Inc., 1969); Prodipto Roy & J.M. Kapoor, The retention of literacy

(Delhi: MacMillan Company of India, Ltd., 1975); H. Schuman, Alex Inkeles, & David H. Smith, "Some psychological effects and noneffects of literacy in a new nation", Economic Development and Cultural Change, 1967, 16, 1-14.

10. M. Ahmed, "Retention of literacy skills in adults", Literary Work, 1973, 11, 43-53; G. Flores, "A study on functional literacy for citizenship in the Philippines", Quarterly Bulletin of Fundamental Education, 1950, 2, 24-28; D. Kosak, "The problem of reading in elementary education", Adult Education, 1963, No. 5-6, 35-38; J. Landy-Tolwinska, "Farmer participants in literacy courses - Poland", Literacy Discussion, 1970, 1, 107-110; H.F. Lionberger & H.C. Chang, Communication and use of scientific farm information by farmers in two Taiwan agriculture villages (Columbia, Missouri: University of Missouri, College of Agriculture, 1968).
11. Russell Beirn, David C. Kinsey and Noel F. McGinn, "Antecedents and Consequences of Early School Leaving: An Analytic Survey of Research Activities", (Graduate School of Education, Harvard University: Occasional Papers in Education and Development, Number 8, 1972); G. Flores; J. Noesjirwan.
12. Alex Inkeles, "The school as a context for modernization", International Journal of Comparative Sociology, 1973, 14, 163-179; R. Sultzman & I. Amnon, "The effects of schooling on psychological modernity: A longitudinal study" (Unpublished manuscript, 1973).

13. Nancy Birdsall, "Child schooling and the measurement of living standards" (Washington, D.C., World Bank Living Standards Measurement Study Working paper No. 14. February, 1982); Nancy Birdsall and Susan Hill Cochrane, "Education and parental decision-making: A two generation approach", in Lascelles Anderson and Douglas M. Windham (Eds.), Education and Development (Lexington, Mass: D.C. Heath, 1982), pp 179-210.
14. Mary Jean Bowman & C. Arnold Anderson, "The participation of women in education in the third world" (Comparative Education Center, University of Chicago, October 1978).
15. Peter Mook and Joanne Leslie, "Childhood malnutrition and schooling in the Terai region of Nepal", Journal of Development Economics, In press.
16. Peter Sellar, David Sprague & Virgil Miedema, U.S. Aid to Education in Nepal: A 20-Year Beginning (U.S. Agency for International Development, Kathmandu, 1981).
17. H.M.G. Nepal, Ministry of Education & Culture, Unpublished data, Kathmandu, 1983.
18. Rajendra B. Shrestha, Accessibility to educational opportunities in the remote areas (Center for Economic Development and Administration, Tribhuvan University Campus, Kathmandu, Nepal, 1976).
19. Beirn, Kinsey, and McGinn, Op. Cit.
20. CERID/WE, Determinants of Educational Participation in Rural Nepal (Center for Education Research, Innovation and Development. Kathmandu, 1983).

21. Barbara Butterworth, Dibya Karmacharya, & Richard Martin, Radio Education Teacher Training Program, Final Evaluation Report (Kathmandu, April 1983).
22. Shrestha, Op. Cit.
23. Birdsall; Birdsall & Cochrane, Op. Cit.
24. Meena Acharya & Lynn Bennett, "The Rural Women of Nepal: An Aggregate Analysis and Summary of 8 Village Studies", in The Status of Women in Nepal, Vol. II, part 9, 1981.
25. Anonymous. Equity and Discrimination Among Children: Household Decision-Making Strategies for the Provision of Schooling in Rural Nepal (Unpublished manuscript, 1983).
26. Prem Kasaju, "Learning to read and write: A major task for development", in M. Mohsin & P. Kasaju (Eds.), On education in Nepal, (National Education Committee, 1974).
27. Shrestha, Op. Cit.
28. Gwendolyn L. Lewis, A model of Turkish adults' educational aspirations for their children (Institute of Population Studies, Hacettepe University, Ankara, Turkey, 1978).
29. Prem Kasaju, Parents' Attitude Toward and Expectations from Education (Tribhuvan University, Center for Education Research, Innovative and Development, Kathmandu, 1982).
30. Norman H. Nie, C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, & Dale H. Bent, Statistical package for the social sciences (2nd edition) (New York: McGraw-Hill, 1975).

31. Dean T. Jamison, Joanne Leslie, & Bal Gopal Baidya, "Determinants of the literacy and numeracy of adults in the Terai region of Nepal" (Paper presented at the annual meeting of the Eastern Economic Association, Boston, May 1979).
32. Moock and Leslie, Op. cit.
33. Dean T. Jamison and Peter Moock, "Farmer education and farm efficiency in Nepal: The role of schooling, extension services and cognitive skills", World Development, 1984, 12, 67-86.
34. Susan Hill Cochrane and Dean T. Jamison, "Educational attainment and achievement in rural Thailand", in A. Summers (Ed.), New Directions for Testing and Measurement: Productivity Assessment in Education (San Francisco: Jossey-Bass, 1982), pp. 43-59.

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