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Gains in the Education of Peruvian Women, 1940 to 1980

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and
Rosemary Bellew

What determines girls' educational attainment? School quality (measured by the number of textbooks and teachers); changes in attitudes and better economic opportunities for educated women; parents' (especially mothers') years of schooling and occupations; and the opportunity cost of sending a girl to school — especially in rural families, or when mothers must hold jobs outside the home.

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Policy, Research, and External Affairs

WORKING PAPERS

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This paper — a joint product of the Education and Employment Division and the Women in Development Division, Population and Human Resources Department — is part of a larger effort in PRE to determine how to improve women's access to education in developing countries and if and how that education improves their productivity and family welfare. The paper will be part of a book on women and the economy of Peru to be published by the Bank. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Cynthia Cristobal, room S6-033, extension 33640 (47 pages, including tables).

Since the mid-1950s, Peru's education policies have been designed to raise skill levels and make education available to more of the population. Those policies rested mainly on expanding the number of schools. As a result, school enrollment rates and attainment levels rose. But an apparent parental preference to educate sons more than daughters meant that boys' schooling levels rose more quickly than girls.' Policies were not enough to brings girls' schooling even with boys,' especially in rural areas.

School quality, measured crudely by the supply of textbooks and the number of teachers, appears to have improved the schooling of women. Girls who had a textbook for their own use attained more than half a year of schooling than those who did not. Changes in attitudes and better economic opportunities for educated women also seem to have strengthened the demand for educating rural girls.

Parents' years of schooling and occupations were significant determinants of educational levels. The impact of these socioeconomic factors lessened over time as the number of schools expanded and primary education became more available.

The relative effects of parents' education differed for boys and girls. In the adult sample, both parents' education had a strong positive effect on daughters' education; for sons, the father's education had double the effect of the mother's education. In the youth sample, the mother's education had a stronger effect on the daughter's education. These differences reflect a preference on the part of fathers to send their sons to school, which mothers partly counterbalanced.

Peru's education policies have reduced the direct costs associated with going to school. But time allocation patterns reveal that the opportunity cost to the family of school attendance could be an effective barrier to further improvements in school enrollment and continuation rates. Even at a young age, girls — especially in rural families — participate in the labor market and contribute substantially to productive work at home.

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Table of Contents

Over the past few decades, expanding and improving the quality of public education have been important components of the Peruvian government's plan to accelerate economic development and redistribute income. This paper addresses the following questions: How rapidly have educational opportunities and schooling levels changed over time? Have they become more equitably distributed between men and women? Have women benefited from recent educational policies as much as men? What other factors (for instance, family background and community characteristics) explain variations in the levels of education between men and women?

The paper is organized as follows. We first trace the expansion of education in Peru and discuss the patterns by gender. Section 2 presents an empirical model of schooling choice within the family and defines the variables used. Section 3 discusses the findings in light of educational change and development, and Section 4 describes gender differences in the education of the present generation.

Trends In Education

Educational opportunities in Peru have changed tremendously since 1940 as a result of major economic changes and reforms in education policy[1/]. In the early 1940s few Peruvians attended school. More than half of all

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1/ Due to a lack of data prior to 1950, most of the discussion pertains to 1950-1980. For these decades educational trends are traced by five-year periods to capture the effects of different administrations on levels of educational attainment. To explain variations in adult educational attainment, each five-year period is matched with the birth cohort whose educational experience corresponds to that period.

adults were illiterate (table 1)[2/]; only one child in three was enrolled in primary or lower secondary school (table 2). Moreover, raising school attendance was particularly challenging since two-thirds of all Peruvians were scattered in rural areas, and 35 percent of the population spoke only Quechua or Aymara--the two main Indian languages--while the language of the schools was Spanish (Government of Peru 1981).

Table 1: Education of Males and Females, Aged 15 and Over, 1940-81

	1940	1961	1972	1981
Percent Literate	42	61	73	82
Males	55	74	83	90
Females	31	48	62	75
Urban	.	82	88	92
Rural	.	41	49	62
Mean Years of Schooling	1.9	3.1	4.4	6.0
Males	2.4	3.8	5.1	6.7
Females	1.4	2.4	3.6	5.4
Highest Level of Education Attended (percentage)				
No school	58	39	27	16
Males	45	26	16	9
Females	69	52	37	23
Primary	34	48	48	42
Males	47	58	54	44
Females	27	38	42	40
Secondary	1	2	5	10
Males	6	14	24	35
Females	3	9	17	28
Postsecondary	1	2	5	10
Males	2	3	6	12
Females	0.3	1	3	9

Sources: Literacy Rates: Government of Peru 1981, Fernandez 1986.

2/ Among Latin American countries only El Salvador, Nicaragua, Honduras, Bolivia, Guatemala, and the Dominican Republic had higher illiteracy rates than Peru in the early 1940s (Drysdale and Meyer 1975).

Table 2: Percent of Children Aged 6-14 and 15-19 Enrolled in School, 1940-81

Age Groups	1940	1961	1972	1981
Ages 6 to 14				
Total	30	58	78	90
Males	34	62	82	91
Females	26	53	75	88
Urban	-	-	90	96
Rural	-	-	63	79
Ages 15 to 19				
Total	17	33	49	56
Males	23	41	57	61
Females	11	26	41	52
Urban	-	-	54	63
Rural	-	-	17	24

Source: Government of Peru 1981, Fernandez 1986.

Since that time educational opportunities have expanded considerably. Appendix figures 1A-3B show the rapid rise in enrollment and in gross enrollment ratios between 1950 and 1980. At the primary level the rise in girls' enrollment came after the increase in boys' enrollment. In 1950 only 69 percent of all girls were enrolled compared to 100 percent of the

boys.[3/] At other levels there was less difference between males and females; educational opportunities were still very limited for both sexes.

The data show that more girls who were of school age during the late 1950s and 1960s (that is, cohorts born between 1950 and 1964) enrolled in primary school than earlier cohorts. As a result enrollment ratios for girls rose from 65 percent in 1955 to 99 percent by 1970, narrowing the difference in enrollment between boys and girls. Males born between 1955 and 1964 show the largest enrollment increases, but since men began the 1950s with already high rates of enrollment, their gains were far less dramatic than those achieved by women.

Educational gains were not limited to primary education. In the 1960s more students went on to secondary school. Men and women born between 1950 and 1959 registered the largest proportional increases in secondary school attendance. Enrollment in higher education began a strong upward trend in 1960 that continued throughout the subsequent decade. But at this level of education, the gap between the percentage of males and females enrolled widened.

3/ Gross enrollment ratios are computed as the ratio of total enrollment to the population aged 6 to 11. When under- or over-age students are enrolled, owing to repetition, early or delayed entry, or re-entry, the ratio can exceed 100 percent. On the other hand, net enrollment ratios exclude over- and under-aged youths. They are computed as the ratio of 6- to 11-year olds enrolled in school to the 6- to 11-year-old population. To gauge how these two ratios differ, Peru's 1980 net enrollment ratio was 85 percent, compared to a gross enrollment ratio of 115 percent. Therefore, in 1980, approximately 30 percent of all students were either under- or over-age, but we do not know the share attributable to repetition, delayed or early entry, or re-entry.

Throughout the years of expansion, rural children were less fortunate than those in urban areas, where many of the new schools were concentrated. In 1972 only 63 percent of rural children aged 6 to 14 were enrolled in primary and lower secondary schools, compared to 90 percent of urban youths. Opportunities for upper secondary and tertiary education were rare in rural communities; only 17 percent of rural youths aged 12 to 17 were enrolled in such schools, compared to 54 percent of the same age group in urban areas (table 2). From 1970, however, an increasing number of rural parents sent their children to primary and lower secondary school. By 1981 the gap in school attendance between urban and rural children was closing. At the upper levels, though, rural residents made little progress. In 1981 only 24 percent of the relevant school-age population attended an upper secondary or tertiary institution, compared to 63 percent of their urban counterparts.[4/]

Changes in education levels mirror these enrollment patterns. The average years of schooling of persons aged 15 and above has increased steadily over time and the proportion of adults who did not attend school has fallen from 58 percent in 1940 to 16 percent in 1981. The strong growth in female enrollment in primary school during the 60s and the trend toward secondary and higher education are particularly evident. The proportion of adult women whose formal education stopped at primary school rose from 38 percent in 1960 to 42 percent in 1972. By that time 24 and 18 percent of all men and women, respectively, had attended secondary school, as against 6 and 3 percent in 1940. By 1981 these proportions rose by 10 percentage points, reflecting

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4/ See table A.1.

comparable enrollment growth for women and men. Higher education showed a similar pattern.

We next examine the impact of school expansion policies on the educational levels of men and women in the context of family resources and preferences for schooling. These influences add to our understanding of the effectiveness of policy reforms.

A Household Model of Education with Gender Differences

The human capital theory identifies the principal benefit from education as raising productivity. In the workplace this increased productivity translates into higher earnings (Becker 1964, Mincer 1974); at home it means more efficient home production, such as child care (Gronau 1977). The hypotheses that more highly educated people learn (that is, produce even greater human capital) more effectively (Ben-Porath 1967), or are better able to deal with problems or "disequilibria" in their lives (Schultz 1975) are related to this model. The model assumes that the decision to begin or continue schooling is a function of returns and costs. Returns are usually measured as expected earnings in the labor market corresponding to given levels of education. Costs, which include both direct outlays and indirect (time) costs, are often measured by the availability of, or distance to, school. A few studies have estimated the effect of the opportunity cost of schooling on enrollment or attainment in developing countries and have found a negative effect (for instance, Rosenzweig and Evenson 1977).

Other factors may also influence enrollment and attainment decisions. A household choice model of schooling investments implies that family background is an important determinant of enrollment and attainment not only because it may reflect the student's schooling preferences and income but also because it measures the support for education in the home. Studies of parental influence report strong positive effects. For example, Heyneman and Loxley (1983) found that four family background variables (mother's and father's education, father's occupation, and books in the home) explained an average of 18 percent of the variance in student achievement in a study of nine developing countries, compared to the 24 percent that was explained by school characteristics. Although research in this area has shifted recently to exploring such questions as the relative effects on achievement of alternative inputs, material versus nonmaterial inputs, or administrative and teaching quality (Lockheed and Komenan 1987), sufficient data to support studies of this genre are harder to come by. Last, genetically determined ability also affects learning and educational attainment (and thus income), but due to limited data on cognitive ability, the effect of this factor on income has been neglected in most studies.[5/]

This framework implies that schooling decisions are influenced by a host of factors, including learning ability, wages in the labor market, proximity of the school, and school inputs. But do these factors have a

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5/ Griliches and Mason 1972 estimated that failure to control for the effect of ability overstates the estimated rate of return to education by between 7 and 15 percent. In a study on Tanzania and Kenya, Boissiere and others (1985) found that controlling for ability lowered the rate of return by about 60 percent.

different effect on men and women? What accounts for gender differences in the amount of schooling?

In a household model of schooling choice, gender can be introduced in several ways. One is to assume that parents do not necessarily have the same preferences for their sons' and daughters' education. Several studies have found that parents tend to favor sons in certain societies (Greenhalgh 1985; Rosenzweig and Schultz 1982). In an economic model this can be shown by representing the household utility as a function of two different commodities--the human capital stock of sons and daughters (Rosenzweig and Evenson 1977, Rosenzweig and Schultz 1980). While serious gender inequality is pernicious, this preference does not necessarily imply discrimination by parents. The unequal treatment of sons and daughters might simply be a rational or efficient response to family resource and technological constraints, and to market conditions, rather than a reflection of their own tastes or preferences. This distinction is helpful in formulating policy.

The human capital model shows that where the labor market rewards the education of males more than that of females, parents may respond by giving daughters less education. Human capital theory also suggests that if the costs associated with schooling were reduced sufficiently, girls' educational levels would rise even without a corresponding increase in female wages. A government school-building program, for example, could yield such a result. Or, if the demand for male child labor increases, the opportunity cost of educating daughters may be sufficiently smaller than for sons (barring strong cultural prohibitions against girls' education).

In certain settings cultural forces, such as norms proscribing women's economic and familial roles, influence parents by imposing a heavy cost (for instance, ostracism) on nonconformist behavior. With economic development and increasing work opportunities for women, tension might build up between traditional social norms and the family's desire to benefit from changing conditions. Which families will respond to these changes, and when? Economic theory does not deal formally with the impact of sociocultural forces but it does predict behavioral adjustments to changes in prices and income. For example, we would expect that a rise in female wages that increases the returns to their education would tend to increase the parents' desire to invest in their daughters' education. The magnitude and speed of the response depends on the acquisition of new information and the price and income elasticities of their demand for education.

Empirical Model

There are several indicators of the amount of educational investment, including school enrollment and number of years of education. The framework above implies the following empirical model of demand for schooling:

$$E = \alpha' X + \epsilon_1 \qquad (1)$$

where E is the educational investment; X is a vector of explanatory variables; and, ϵ_1 is a random disturbance term. Since parents may or may not invest as

much in the education of daughters as in sons, this equation should be estimated separately for males and females to allow the α coefficients to vary between the sexes.

We estimate demand for schooling for two samples of the Peru Living Standards Survey (PLSS): a sample of adults aged 20-59,[6] and a sample of youths aged 5-19. For the adult sample we examine the determinants of the highest level of schooling completed; for the youth sample we explain school enrollment or participation.

The explanatory variables X include birth cohort, parental background, and community characteristics. Birth cohort reflects changes in aggregate conditions during different periods. They serve as a crude measure of shifts in the labor market, changes in the economy, or reforms in education that have affected school availability. Because the effects of these events are confounded in the estimates of α, the results are illustrative and meaningful only if they are linked to historical events. Early in our study we found strong cohort differences. Rather than simply measure these effects as intercepts, we estimated the equation separately for six birth cohorts. For the adult sample, each group corresponds to a five-year period (except for the earliest and most recent periods).[7] Since the youth sample spans a much

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[6] Although 23 percent of those aged 20-24 were still enrolled in school when the data were collected, the proportion is much higher at younger ages.

[7] Those born in 1925-39 were grouped together because there were fewer observations for the oldest cohorts, and the lack of data prior to 1950 makes it impossible to link the educational experiences of this group to historical events.

shorter period, we include birth cohort as an explanatory variable, defined as age splines.

Parents' characteristics in the equations include years of schooling completed. Parents' education captures several factors--taste for schooling, which may be passed on to children, ability to supervise children's education, and income, which determines ability to pay for education. Although these are different factors, their effects are all predicted to be positive and thus difficult to disentangle. No better measures for each effect were available.

Whether the child lived with the mother and/or father shows who was present to supervise the child's schooling, and more importantly, captures the effect of family stability. Unfortunately, if the child did not reside with the parents, we do not know the reason for the separation nor do we know if the separation was permanent or temporary. In any case, we expect a stable family environment and parental supervision to have positive effects on school attainment.

Parents' income is not included in the analyses for several reasons. First, we have no data in the adult sample for respondents who were not living with their parents. Moreover, current measures of parents' incomes are not likely to reflect true cross-sectional differences at the time of schooling. In both the adult and youth samples only paid employment is included as parental income. In lieu of income we use parents' occupation as a proxy in the adult sample. The occupational categories are broad but reflect those occupations pursued for most of their lifetime. In the youth sample we have

better measures of the family's wealth at the time of schooling. As explanatory variables we include number of rooms in the house, whether the house is electrified or not, and the size of farm land cultivated. Since the land variable is a sum of leased and owned land, it confounds both a (positive) wealth effect and an (negative) opportunity cost effect.

Community characteristics at the time of schooling capture the effect of differences in levels of economic development, public services, and school availability. The level of community economic development determines opportunities for work in the local labor market, and thus returns to education in the area. In the absence of public community characteristics, we use two city-noncity dummy variables. The premise is that city dwellers generally have greater access to public facilities--such as schools--and more active labor markets. To the extent that the availability of schools influences an individual's choice of residence, these variables may be endogenous. But, this is less likely to be the case for 8- and 13-year-olds than for older youths.

For a smaller sample--those who have attended school--we estimate a second equation that examines the effect of specific school characteristics. Data on school characteristics are available only for this group. This regression, however, is likely to yield biased coefficients--the bias stemming from the fact that the sample would be drawn on the basis of enrollment as a dimension of schooling choice. To remove the bias, we apply a method similar to Heckman's (1979) two-step sample selection bias correction:

$$E = \alpha'X + \beta'Z + \delta\lambda + \epsilon_2 \qquad (2)$$

where Z pertains to characteristics of the primary school attended. By including λ in equation (2), we estimate the coefficients of primary school characteristics on educational attainment given that the error term is associated with the probability of having attended school.[8/] Our results indicate that estimating the effects of the included factors on years of schooling based only on the sample of adults who attended school yields biased estimates. The coefficients of λ in both the male and female regressions are significantly different from zero, and the estimated coefficients of a few included variables are significantly different in the specifications with and without λ[9/].

8/ We define a variable that captures the probability of being in the sample. The variable is obtained from the first step of the procedure which estimates the following relationship underlying the probability S of having attended school:

$$S^* = \gamma'Z + \mu$$

and $S = 1$ if $S^* > 0$

$S = 0$ otherwise,

where W is a vector of variables that explain school entry and μ is a random error term. From probit estimates we compute λ which is the ratio of the ordinate of the standard normal distribution to the cumulative normal.

9/ The coefficients of λ in table 7 are statistically significant and negative in sign. Due to data limitations we do not have variables beside the school characteristics to identify the choices of entry to school and years of schooling. We compared the estimates from the specifications with and without λ to examine the selection bias. The coefficients of two family background variables were significantly different when comparing the two sets of specifications: first, "mother has no job" in the regression for males, and second, "lived in a city at age 13" in the regressions for males and females. Their coefficient estimates are much larger in the specification without λ, implying that their impact on years of schooling comes primarily from their effect on entry to school. Without λ, the coefficients of the school variables are also numerically larger, though not significantly.

The variables Z refer to the school the respondent attended, not to the primary school that is generally available to the community. Thus it can be argued that the values of these variables are themselves a result of family decisionmaking that would bias their estimated coefficients. To the extent that only one primary school is available in many communities, however, we need not worry about this statistical problem. The variables include the availability of reading material and/or math books, the availability of furniture in the school, and the number of teachers and grades in the school. The availability of textbooks and school furniture measures school quality and is expected to have a positive effect on school achievement.[10/] These material inputs are also likely to have a positive effect on attainment levels, though the linkage is less clear. The number of teachers and grades offered is a crude measure of school size and supply. Given the number of grades offered, the number of teachers indicates both the number of school places and the quality of the school. But without information on class size, we cannot draw any conclusions about quality from this variable. The number of grades offered roughly measures supply. A grade-four student who wants to continue on to grade five cannot do so if the available and affordable primary school does not offer grade five.

Next, we present empirical findings for the adult and youth samples. We discuss first the education levels attained and then the estimates of the above model.

10/ See Fuller 1985 for a review of past studies.

Empirical Results from the Adult Sample

The adult sample consists of 5,644 women aged 20-59. For comparison we also analyzed a sample of 5,241 men of the same ages. Table A.2 shows the sample by current place of residence and by birth year. The individuals in the sample are, on average, nearly equally distributed across Lima, other urban areas, and rural areas, with a slightly larger proportion in rural areas.[11/] The spatial distribution of the sample, however, differs by cohort. More than 40 percent of the oldest men and women live in rural areas, compared to about a third of the youngest adult cohorts.

Educational Profiles by Gender and Residence

Table 3 gives the educational profiles of the sample by gender and place of residence. There are clearly large differences in levels of education between men and women. Women have completed an average of only five and a half years of school, compared to seven years for men. While only 8 percent of the men did not attend school, 25 percent of the women never enrolled. This percentage of women with some secondary and higher education was 28 and 12, respectively, compared with corresponding percentages of 35 and 18 for men. These results are very similar to the 1981 census results (table A.1). Since 1981, however, the average number of years of schooling has risen

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11/ We do not estimate the models separately by current residence because this location could differ from the place of residence at the time of schooling. Thus place of residence is included as an explanatory variable in the regressions.

slightly; a smaller proportion of students drop out after primary school and a slightly larger proportion continue on to higher education.

Table 3: Educational Levels in Lima, Other Urban Areas, and Rural Areas (percentage)

Educational attainment	Females	Males	Lima	Other urban areas	Rural
Average years of schooling	5.5 (4.6)	7.1 (4.4)	8.8 (3.9)	7.5 (4.3)	3.2 (3.5)
Level of schooling					
Never attended	24.3	7.7	3.2	7.3	33.2
Primary	35.9	39.4	24.0	34.9	50.2
Secondary	28.2	35.3	48.9	37.4	13.8
Postsecondary	11.7	17.7	23.9	20.4	2.9

Note: Numbers in parentheses are standard deviations.

The largest gender differences in educational attainment are between rural and urban areas. Lima residents have the highest levels of education (about nine years). In contrast those in rural areas have completed, on average, only three years of schooling. Moreover, 33 percent of all rural adults have never been to school; and only 14 and 3 percent have continued to secondary and higher education, respectively, compared to 49 and 24 percent of adults in Lima. The relatively high proportion of Lima residents with some secondary and postsecondary education reflects both the greater availability of such schools in Lima as well as the decision to migrate to Lima in search of more advanced education or better employment opportunities.

Changes in Educational Levels

The PLSS data confirm that schooling levels have increased steadily for men and women. But since the rise has been more rapid for women than for men, the gender gap in schooling has narrowed. Women born during 1945-59 showed the largest percentage increase in number of years of schooling completed. Trends for men followed a slightly different pattern; their years of schooling increased earlier, but their gains tapered off with the cohort born in 1955-59.

This trend was the result of increasing enrollment rates and higher probability of continuing on to secondary and higher education. The proportion of women who never attended school fell dramatically from over 40 percent in the two oldest cohorts to only 8 percent in the youngest cohort. For men, the proportion never enrolled in school fell from 15 percent of the oldest to 3 percent of the youngest cohort. The proportion of adults with some secondary schooling more than tripled. The effect of the expansion of educational opportunities was particularly evident for individuals born between 1945 and 1959, that is, those who would have been of secondary school age during the late 50s and 60s. Similarly, women born between 1950 and 1954 and who would have been of tertiary school age during the 60s also showed a significant increase in postsecondary schooling.

Table 4: Highest Level of Education, by Birth Cohort and Sex
(percentage of sample)

	BIRTH COHORT					
	1925-39	1940-44	1945-49	1950-54	1955-59	1960-66
Females						
No school	43.0	36.5	28.1	19.7	12.6	8.3
Primary	40.7	42.5	39.6	37.1	32.2	27.6
Secondary	12.5	15.0	22.7	28.0	38.3	46.5
Postsecondary	3.8	6.0	9.7	15.2	16.9	17.6
Average years attended	3.1	3.2	4.8	6.6	7.0	7.6
Males						
No school	15.2	10.8	8.5	3.9	2.6	3.3
Primary	57.9	53.8	42.7	34.1	25.2	24.0
Secondary	18.5	19.9	32.4	36.4	45.1	54.6
Postsecondary	8.4	15.5	16.4	25.6	27.1	18.1
Average years attended	4.8	6.6	6.8	8.3	8.7	8.3

What Explains Educational Attainment?

The strong time trend resulting from policy reforms argues for estimating the schooling function separately for birth cohorts. Moreover, testing the homogeneity of results across birth cohorts shows that the cohort effects were not limited to shifts in the intercept but also influences the effects of other variables. To simplify the presentation of results for two sets of regression models estimated for each birth cohort, we focus on a few variables that show interesting cohort patterns. Tables 5 and 6 show the results for women and men, respectively. The means of all variables by cohort are in tables B.2 and B.3.

Table 5: Determinants of School Attainment Levels: Regression Results for Adult Females

Birth cohort:	1925-1939	1940-1944	1945-1949	1950-1954	1955-1959	1960-1966
Variable	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient
INTERCEPT	-0.448**	-0.390	0.342	0.736	2.145**	3.569**
MOTHER'S YEARS OF SCHOOLING 1/	0.490**	0.466**	0.460**	0.442**	0.317**	0.270**
FATHER'S YEARS OF SCHOOLING 1/	0.263**	0.325**	0.362**	0.329**	0.325**	0.201**
LIVED WITH MOTHER AT AGE 10	0.792**	0.883*	0.783*	0.275	-0.535	-0.024
LIVED WITH FATHER AT AGE 10	0.199	0.183	0.414	0.541	1.398**	0.202
OCCUPATIONS: 2/						
MOTHER IS A WHITE-COLLAR WORKER	0.854	1.173*	0.903	0.940*	1.180**	1.053**
MOTHER IS A BLUE-COLLAR WORKER	0.222	0.460	-0.052	0.144	0.157	0.249
MOTHER HAS NO JOB	0.786	0.925	0.360	0.827**	0.209	0.608**
FATHER IS A WHITE-COLLAR WORKER	1.078	0.919*	1.251**	1.958**	1.354**	1.388**
FATHER IS A BLUE-COLLAR WORKER	0.895	0.168	0.966**	1.612**	1.279**	1.597**
LIVED IN A CITY AT AGE 8	1.259	-0.350	0.219	0.077	0.563	1.498**
LIVED IN A CITY AT AGE 13	0.353	2.078*	1.366**	1.607**	1.055*	0.116
ADJUSTED R2	0.608	0.584	0.553	0.620	0.504	0.491

1/ A dummy variable taking on the value of 1 if years of schooling was missing was also included. The estimated coefficients are not reported here.

2/ Omitted category is mother or father is an agricultural worker. Also included in the regressions is a missing data category; results not shown.

* Statistical significance at 5 percent in a two-tailed test.

** Statistical significance at 1 percent in a two-tailed test.

Table 6: Determinants of School Attainment Level: Regression Results for Adult Males

Birth cohort:	1925-1939	1940-1944	1945-1949	1950-1954	1955-1959	1960-1966
Variable	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient
INTERCEPT	-1.867**	2.170**	2.248**	4.386**	4.465**	4.501**
MOTHER'S YEARS OF SCHOOLING 1/	0.388**	0.356**	0.263**	0.208**	0.272**	0.161**
FATHER'S YEARS OF SCHOOLING 1/	0.382**	0.452**	0.503**	0.451**	0.193**	0.231**
LIVED WITH MOTHER AT AGE 10	0.223	-0.255	0.600	-0.068	0.692	0.063
LIVED WITH FATHER AT AGE 10	0.273	0.867	0.548	0.258	0.189	0.591*
OCCUPATIONS: 2/						
MOTHER IS A WHITE-COLLAR WORKER	0.042	0.515	1.747**	-0.063	0.850*	0.931**
MOTHER IS A BLUE-COLLAR WORKER	-0.426	-0.934	-0.279	0.667	-0.241	0.484
MOTHER HAS NO JOB	0.323	0.446	0.754*	0.225	0.620*	0.523*
FATHER IS A WHITE-COLLAR WORKER	1.366**	1.736**	0.513	1.560**	1.407**	0.757**
FATHER IS A BLUE-COLLAR WORKER	0.286	1.125**	0.832*	1.607**	1.335**	1.089**
LIVED IN A CITY AT AGE 8	0.358	-0.413	-0.457	-0.054	0.808	-0.540
LIVED IN A CITY AT AGE 13	1.499**	2.057**	1.771**	0.693	0.594	1.596**
ADJUSTED R2	0.490	0.501	0.46	0.465	0.402	0.406

1/ A dummy variable taking on the value of 1 if years of schooling was missing was also included. The estimated coefficients are not reported here.

2/ Omitted category is mother or father is an agricultural worker. Also included in the regressions is a missing data category; results not shown.

* Statistical significance at 5 percent in a two-tailed test.

** Statistical significance at 1 percent in a two-tailed test.

Influence of parents on education. While the effect of parents' education on years of schooling completed is positive and statistically significant in each cohort regression, the effect diminishes over time. For both men and women, the effect of parents' education is smaller for the younger cohorts than for the older ones. The decline occurs after cohorts 1950-54 and 1955-59 for women and men, respectively. (The government's expansionist education policies in the mid-50s and 60s could have affected youths in the early years of schooling.) One interpretation of this result is that school reforms have improved access to education among broad sectors of the population, thereby weakening the linkage between socioeconomic status and education. Another explanation is that demand for education, influenced by higher market and nonmarket returns to education has increased across generations. This happened over a period when the parents' educational attainment had also risen. A third interpretation is that as education becomes more nearly universal and compulsory, the parents' attitudes toward schooling matter less.

There are no clear patterns pertaining to residence with parents at age 10, except for women who lived with their mothers. This relationship had a large positive effect on schooling for the older cohorts, but not for the younger ones. These results may stem from the fact that a larger proportion of the younger females in the sample lived with their mothers at age 10,[12/] so there is less variance in the younger cohorts. Another possible explanation is that young daughters who lived away from home were more likely to have made

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12/ Table A.3 shows that 94 percent women born of 1960-66 lived with their mother at age 10, whereas only 86 percent of women born in 1925-39 did.

the move for educational reasons. In the older cohorts, because there was less demand for female education, this was less likely to have been the case.

The conclusion that the link between socioeconomic background and educational attainment is weakening is based on an examination of the effects of parents' occupation on female schooling. Parents' occupation and education should be correlated positively, but since we also control for parents' education, occupation presumably captures other effects. For example, mothers with no occupation could indicate greater inputs to the training of children.

The results show that daughters of mothers with white-collar occupations have significantly higher levels of schooling than farmers' daughters--about one more year. The magnitude of this effect seems to have been relatively stable across cohorts. Second, daughters of mothers with no jobs have significantly more education than farmers' daughters. But the point estimate for the youngest cohort suggests that this difference may have narrowed.

In contrast the coefficient estimates for "father is a white-collar worker," which are higher, increase significantly over time up to cohort 1950-54, and decline thereafter. These estimates indicate a widening of the schooling gap up to cohort 1950-54 between women whose fathers were white-collar workers and those whose fathers were farmers. This gap is widest for the 1945-50 cohorts, which were the first potential beneficiaries of the early primary education programs. As attitudes toward the education of girls changed in rural areas, however, the gap narrowed among younger cohorts. Our

results for men also indicate that those whose fathers held white or blue-collar jobs had an edge over farmers' sons, and while the former group's enrollment increased first, as noted above, it eroded earlier than the women's.

These results show that the education policies of the mid-50s and 60s had an equalizing effect across broad segments of the population. But the initial impact of relaxing the supply constraint through building more schools was to worsen the inequality among groups with divergent views on the benefits of education and therefore different demands. Perhaps the persistent message about the importance of education in Peru's development increased the demand from women and rural residents.

Effects of school inputs. The primary school inputs that affect years of schooling are textbooks, teachers, and the number of grades offered. Consider the statistically significant coefficient estimates for the textbook variable. First, for both males and females, the estimates increased numerically in the younger cohorts (that is, up to cohort 1955-59). These estimates suggest that, as primary schools became more available, textbooks had more impact on schooling attainment. Second, the textbook effect was larger for females than males. Perhaps because there was less interest in the education of girls, the quality of the learning process was more important in determining how many years of schooling girls had.

Table 7: Effects of School Inputs on Educational Level: Regression Results for Adults

Birth cohort:	1925-1939	1940-1944	1945-1949	1950-1954	1955-1959	1960-1966
Variable	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient	Estimated coefficient
A. FEMALES 1/						
HAD READING AND/OR MATH BOOK(S)	0.636**	0.692*	0.891**	-0.065	1.145**	0.725**
NUMBER OF GRADES IN SCHOOL	0.466**	0.282	0.523*	0.493	0.838**	1.138**
SCHOOL HAD FURNITURE	0.410	0.704	0.912*	-0.329	-0.484	0.223
SCHOOL SERVED FREE FOOD	-0.456	0.029	-0.330	0.723**	-0.012	-0.054
NUMBER OF TEACHERS IN SCHOOL						
1 - 3 TEACHERS	0.290*	0.058	0.162	0.510**	0.217	-0.035
4 - 6	0.011	0.584	0.118	0.088	0.117	0.039
6 +	0.031	0.149	0.034	0.106*	0.076	0.055
LAMBDA	-0.180	-0.192	-1.855**	-2.115**	-5.217**	-6.806
ADJUSTED R2	0.482	0.533	0.502	0.580	0.506	0.523
B. MALES						
HAD READING AND/OR MATH BOOK(S)	0.542**	0.249	0.307	0.583**	0.918**	0.316
NUMBER OF GRADES IN SCHOOL	0.565**	0.848**	0.955**	1.198**	1.214**	1.342**
SCHOOL HAD FURNITURE	0.425	0.740	0.342	0.627	0.611	-0.139
SCHOOL SERVED FREE FOOD	-0.191	0.523	0.076	0.188	-0.262	-0.034
NUMBER OF TEACHERS IN SCHOOL						
1 - 3 TEACHERS	0.212	0.036	0.273	0.172	0.480**	0.411**
4 - 6	0.113	0.134	0.089	0.109	-0.039*	-0.010**
6 +	0.104	0.062	0.048	0.062	0.018**	0.025*
LAMBDA	0.296	-1.307	-3.002**	-3.206*	0.533	-5.688**
ADJUSTED R2	0.513	0.521	0.472	0.486	0.460	0.465

1/ Other included variables are the same as in tables 5 and 6.

The number of grades in primary school has a large positive effect that increases across cohorts.[1] For males born before 1940, adding a grade would have increased schooling levels by half a year. For males born in the 60s, adding a grade would have raised attainment levels by 1.3 years. The increase in this effect is largest for the cohort whose schooling years coincided with the early period of school expansion. A similar pattern emerges for females, but the increase occurs later. These results suggest that supply was a principal constraint in the older cohorts. Additional school places met some of the existing demand for education; in addition, they raised schooling levels by generating a higher demand in the younger cohorts.

Holding constant the number of grades offered in a primary school, more teachers per school tended to increase the number of years students spent in school. The coefficients are considerably smaller when increasing the number of teachers beyond three. The few statistically significant coefficients suggest that this factor may have been more important in the younger cohorts. Since we controlled for the number of grades, the teacher variable provides a rough measure of quality. That is, increasing the number of teachers raises the likelihood that one teacher taught one class at a time. The cohort trend, though weak, suggests that school quality had become more important in explaining the variance in educational attainment.

Results from the Youth Sample

The education levels of females continues to rise in the younger cohorts, and the gender gap appears to be narrowing (table 8). The principal findings are as follows:

- The higher proportion of 8- to 10-year-olds enrolled than 5- to 7-year-olds (and even 11- to 13-year-olds) suggests a later age of entry in school than the prescribed ages five or six.

- By ages 8-10, most children are in school. Enrollment ratios for girls and boys are nearly equal, though still somewhat lower for girls in both urban and rural areas.

- From ages 11-13, enrollment by gender diverges, especially in rural areas. Whereas more boys are entering school even at that age, girls have started to drop out: by ages 14-16 the gap is more than 20 percentage points.

- From ages 17-19, even boys are leaving school, leveling out enrollment ratios between the sexes. In Lima and other cities, more than half the students of this age are still in school. In rural areas, however, only about a fifth of the girls and a third of the boys are still enrolled. Applying these cross-section enrollment ratios to a synthetic cohort, they are consistent with expected attainment levels by age 19 (10.7 years for girls and 11.4 years for

boys). These levels are about three years more than the average number of years completed by adults aged 20-26, and the female-male ratio has improved slightly from 0.92 to 0.94.

Table 8: School Enrollment by Region
(percentage)

Age Group	Females	Males
Ages 5-7		
Lima	84.8	87.9
Other urban areas	75.2	73.9
Rural	47.1	46.9
Total	66.5	65.3
Ages 8-10		
Lima	96.5	98.8
Other urban areas	93.2	94.1
Rural	82.0	83.7
Total	89.0	91.1
Ages 11-13		
Lima	97.1	97.4
Other urban areas	92.1	93.8
Rural	78.2	90.3
Total	87.7	92.8
Ages 14-16		
Lima	91.5	95.9
Other urban areas	83.8	86.9
Rural	44.4	68.8
Total	69.3	81.0
Ages 17-19		
Lima	65.3	64.8
Other urban areas	54.8	61.8
Rural	22.3	32.2
Total	45.3	50.3

The reduction in the proportion of youths who never attended school is further evidence of educational progress (table 9). Aside from the five- to seven-year-old group, the percentage is lower for female youths than any

adult cohort.[13/] This improvement is most evident among rural girls, attesting to the rural schools' success in drawing a larger fraction of children, especially girls.

Table 9: Percentage of Youths Who Have Never Attended School by Region
(percentage)

	Lima		Other urban areas		Rural		All Peru	
Age Group	F	M	F	M	F	M	F	M
Ages 5- 7	13.4	8.9	21.3	23.0	50.0	49.4	30.3	31.1
Ages 8-10	0.8	0.0	2.1	1.1	10.2	10.2	5.0	4.3
Ages 11-13	0.4	0.0	1.0	0.4	7.1	1.4	3.2	0.7
Ages 14-16	0.0	0.0	0.8	0.3	8.5	1.1	3.2	0.5
Ages 17-19	0.4	0.4	1.1	0.0	9.8	3.2	3.2	1.1

Although most girls enter school, many do not persist. With higher dropout rates, girls still have fewer years of schooling (table 10). Twenty-eight percent of girls aged 14-16 had already dropped out compared to 19 percent of boys, and 53 percent of 17-19-year-old females were no longer in school compared to 49 percent of males. Moreover, urban-rural differences in dropout rates are large: 52 percent of rural girls aged 14-16 had dropped out compared to 8 percent of girls in Lima and 16 percent of those in other urban areas. Of those aged 17-19, 75 percent of rural girls were no longer in school, compared to 34 and 45 percent of those residing in Lima and other urban areas, respectively. Figure 1 illustrates the lower school survival probabilities of girls at each grade level. Furthermore, rural girls (and

13/ Because of late entry into school especially in areas where compulsory schooling may be difficult to enforce, the enrollment ratio among very young children is poor measure of the proportion of youths who will never attend school.

boys) are much less likely to enroll in secondary school than urban girls, as shown by the steep drop in survival rates between grades five and six.

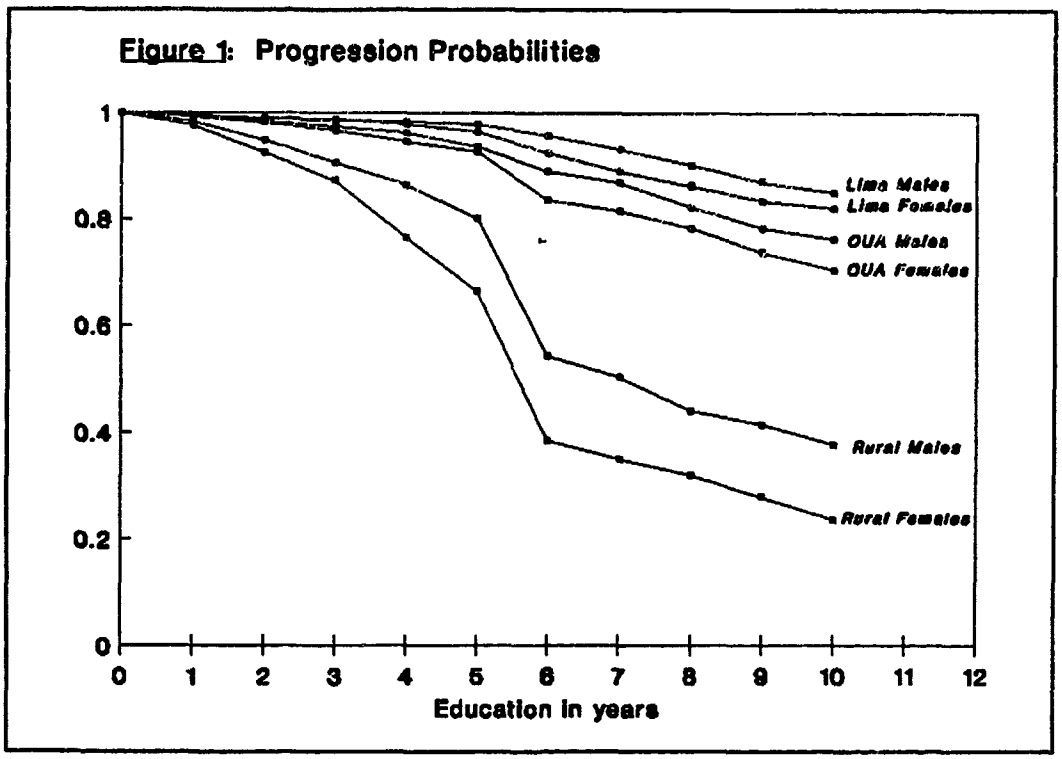

Table 10: Percentage of School Dropouts by Region

	Areas							
	Lima		Other urban		Rural		All Peru	
Age	F	M	F	M	F	M	F	M
5-7	2.1	3.5	4.4	4.0	5.7	7.3	5.2	4.5
8-10	2.8	1.2	4.8	4.8	8.7	6.7	4.8	6.3
11-13	2.5	2.6	6.9	5.8	15.8	8.4	6.6	9.4
14-16	8.5	4.1	15.5	12.9	51.5	30.4	18.6	28.4
17-19	34.4	35.0	44.6	38.2	75.3	66.8	49.1	53.2

What Factors Explain School Enrollment?

We estimated equation (1) for the youth sample, with the dependent variable being school participation, as a logistic function. Table 11 shows the parameter estimates for girls and boys.

Table 11: Determinants of School Enrollment: Logistic Regression Results for Youth Sample, Males and Females

	Females		Males	
Variables	Beta	s.e.	Beta	s.e.
YEARS OF SCHOOLING	0.426	0.31	0.584	0.32
AGE SPLINES:				
8 TO 10	-0.070	0.13	-0.052	0.14
11 TO 13	-0.448	0.08	-0.185	0.09
14 TO 16	-0.543	0.06	-0.527	0.07
17 TO 19	-0.497	0.06	-0.610	0.06
MOTHER'S YEARS OF SCHOOLING	0.077	0.02	0.021	0.02
FATHER'S YEARS OF SCHOOLING	0.054	0.02	0.095	0.02
LIVED WITH MOTHER AT AGE 10	0.087	0.20	0.049	0.20
LIVED WITH FATHER AT AGE 10	0.286	0.14	0.249	0.14
HAS ELECTRICITY AT HOME	0.76	0.15	0.602	0.16
NUMBER OF ROOMS IN HOME	0.141	0.03	0.075	0.04
DRY LAND FARMED BY HOUSEHOLD	0.001	0.00	0.000	0.00
WET LAND FARMED BY HOUSEHOLD	0.025	0.02	0.016	0.02
RESIDES IN OTHER URBAN AREA (DUMMY)[a/]	-0.304	0.15	-0.320	0.16
RESIDES IN RURAL AREA (DUMMY)	-0.641	0.19	-0.296	0.21
HAD READING AND/OR MATH BOOK(S)	0.277	0.14	-0.005	0.15
NUMBER OF GRADES IN SCHOOL	0.282	0.06	0.278	0.06
SCHOOL HAD FURNITURE	-0.062	0.22	0.045	0.21
SCHOOL SERVED FREE FOOD	0.116	0.11	-0.048	0.11
NUMBER OF TEACHERS IN SCHOOL	0.109	0.04	0.087	0.04
4-6 TEACHERS	-0.109	0.06	0.047	0.06
6+	-0.105	0.05	-0.079	0.05
-2 Log-likelihood	1445.5		1065.46	
Sample size	3855		3960	

Note: Data is for youths aged 8 to 19.
[a/] Omitted category is Resides in Lima.

Given the age of the child, parents' education has a strong influence on children's schooling. The mother's education exerts a stronger effect on daughters than the father's, but the father's presence at home is an important factor in girls' education. Two reasons can be cited for this result: In families where income is unstable because of the absence of the father, girls' education is more likely to suffer than boys'. And, since the mother may be the family's primary breadwinner, daughters are needed to substitute at home.

The family's wealth and standard of living, as measured by whether the home has electricity and the number of rooms in the house are positively and significantly associated with school enrollment, although these factors affect daughters more than sons. For example, if the household uses electricity, daughters are 2.2 times more likely to be enrolled than not, while sons are 1.8 times more likely. These results indicate that wealthier families are more likely to send their daughters to school.

When expressed as percentages of urban children in school, rural percentages are lower for both boys and girls (74 and 55 percent, respectively). The amount of land farmed by the household does not appear to affect enrollment. Children in urban areas outside Lima are also less likely to be enrolled than children in Lima, but not to the same extent as in rural areas.

Finally, the logit coefficient estimates for the school-related variables indicate that schools and textbooks are more important factors in

girls' than in boys' enrollment probability. If the primary school attended supplies a free textbook, girls are 1.3 times more likely to be enrolled, whereas it has no effect on boys' enrollment. Whether the school serves a free lunch has no significant impact. A complete primary school increases the likelihood of enrollment by 28 percent for both girls and boys. The number of teachers, which is another measure of school availability, school size, and the number of school places[14/] has a larger positive effect on girls' enrollment, thus emphasizing the importance of the number of places and quality of schools in increasing girls' enrollment.

Nonschool Activities of Females

To understand how families choose their children's schools, it is important to consider what these children do in addition to--or in place of--going to school. The amount of time girls spend working or out of the household indicates that the opportunity cost of their time in school may be quite high and thus may explain why fewer girls attend school. Of those not in school during the survey week, many reported working (table 12.B). Thirty percent of girls aged 5-7 and 50 percent of those aged 8-10 reported positive hours in the market--slightly higher percentages than for boys of similar ages. In the group aged 11-13, a greater proportion of girls than boys reported market work--only 26 percent of girls had zero market hours, compared to 35 percent of boys. Of those working, girls had longer market hours as

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14/ We control for number of students in the school only roughly through the inclusion of number of grades offered. If this sufficiently distinguishes schools by class size, then number of teachers could be interpreted as an indicator of school quality.

well. Most girls--especially in the oldest group--were employed as unpaid workers on or off the farm. About 8 percent of the youngest girls were employed as paid workers in family enterprises or domestic work. In the teenage groups, a higher fraction of out-of-school boys were working in the labor market than girls. At these ages, marriage and motherhood are likely to be the reason for girls being both out of school and outside the labor force.

Table 12: Labor Participation and Weekly Work Hours, All Peru

	Weekly Hours Worked									
	Females					Males				
Age	0	1-14	15-28	29-42	42+	0	1-14	15-28	29-42	42+
					(In-school youths)					
5- 7	89.4	5.8	3.0	0.9	0.9	81.0	10.9	5.7	1.4	1.1
8-10	75.4	12.7	7.5	2.8	1.6	72.3	12.8	8.3	3.6	2.9
11-13	66.4	14.8	11.1	3.9	3.7	61.9	15.7	11.8	5.7	4.8
14-16	68.0	17.3	8.1	3.3	3.3	53.6	14.9	14.0	8.4	9.1
17-19	71.7	12.2	7.5	3.9	4.7	52.7	15.6	9.8	6.5	15.4
All	73.4	13.0	7.9	3.0	2.7	64.8	14.1	10.2	5.2	5.8
					Out-of-school youths					
5- 7	69.6	5.4	8.1	9.5	7.4	71.5	9.3	7.0	7.6	4.7
8-10	50.4	10.4	12.2	13.9	13.0	51.6	7.5	9.7	11.8	19.4
11-13	25.6	17.4	12.4	16.5	28.1	34.7	16.7	16.7	12.5	19.4
14-16	32.0	13.2	13.9	15.0	25.9	17.1	6.3	10.8	25.3	40.5
17-19	38.9	11.8	11.5	16.6	21.2	29.3	4.8	10.6	15.4	39.9
All	41.2	11.7	11.8	14.9	20.4	38.2	7.2	10.3	15.0	29.2

Table 12.A shows that even girls in school were working; 11, 25, and 34 percent of those aged 5-7, 8-10, and 11-13, respectively. These rates are a few percentage points lower than for boys. In older age groups, there is a

much wider spread, and teenage boys aged 14-19 are more likely to have positive work hours.

In addition to market work, girls from age 8, in school or not, work many more hours at home than boys (table 13). Thirty-eight percent of girls aged 8-10 who were out of school worked at least 15 hours a week in the market and 23 percent worked at least the same number of hours at home. In comparison the corresponding percentages for boys of the same age are 41 and 15 percent, respectively.

Table 13: Hours a Week Spent By Youths in Household Work, All Peru

	Weekly Hours Worked									
	Females					Males				
Age	0	1-14	15-28	29-42	42+	0	1-14	15-28	29-42	42+
					(In-school youths)					
5- 7	45.7	49.1	4.5	0.6	0.2	45.6	49.3	4.6	0.5	0.0
8-10	18.0	67.3	11.7	2.2	0.8	28.0	62.5	8.0	1.2	0.3
11-13	9.0	64.4	20.4	4.7	1.5	19.0	66.4	12.2	1.9	0.5
14-16	7.7	54.9	26.7	8.0	2.7	21.2	66.2	11.1	1.4	0.1
17-19	8.3	44.2	29.4	14.3	3.9	30.2	56.7	10.7	1.9	0.5
All	16.9	58.7	17.8	5.1	1.6	27.1	61.7	9.6	1.4	0.3
					(Out-of-school youths)					
5- 7	37.8	53.4	6.1	2.0	0.7	37.2	55.8	7.0	0.0	0.0
8-10	9.6	67.8	13.9	5.2	3.5	13.8	74.5	9.6	2.1	0.0
11-13	8.1	54.5	21.1	12.2	4.1	15.3	69.4	15.3	0.0	0.0
14-16	9.3	34.3	28.7	19.8	7.8	31.0	61.4	7.0	0.6	0.0
17-19	6.9	27.0	30.5	19.8	15.8	41.0	45.7	9.6	2.9	0.8
All	12.2	40.0	23.9	14.9	9.0	33.4	55.6	9.1	1.6	0.3

These work patterns differ across regions. Youths in Lima are the least likely to be employed in the labor market, followed by those in other urban areas and in rural areas. Seventeen percent of girls in Lima aged 8-10 who were not in school were employed in the labor market, compared to 27 and 59 percent of girls living in other cities and rural areas, respectively (table 14). Of rural girls in this age group, 48 percent worked at least 15 hours in the week prior to the survey. Regional differences, though not as large, are also evident in the number of hours spent in household work (table 15). Twenty-five percent of rural girls out of school, aged 8-10, worked 15 hours or more a week in the household, compared to 19 percent of girls in other cities.

Table 14: Labor Participation of Females and Weekly Work Hours, by Region

	Weekly Hours Worked									
	In-school youths					Out-of-school youths				
AGE	0	1-14	15-28	29-42	42+	0	1-14	15-28	29-42	42+
5- 7	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
8-10	92.8	5.9	0.8	0.0	0.4	83.3	16.7	0.0	0.0	0.0
11-13	87.2	8.8	1.8	0.9	1.3	40.0	20.0	0.0	0.0	40.0
14-16	83.0	10.1	2.3	1.8	2.8	53.3	6.7	6.7	0.0	33.3
17-19	79.7	8.2	3.8	2.5	5.7	66.7	7.7	5.1	5.1	15.4
Lima	88.2	7.1	1.7	1.0	1.9	67.0	8.0	4.5	3.6	17.0
5- 7	91.8	5.2	2.6	0.4	0.0	83.3	0.0	8.3	5.6	2.8
8-10	84.8	9.2	4.6	1.1	0.3	73.1	7.7	7.7	3.8	7.7
11-13	75.2	13.0	6.5	3.5	1.8	44.4	18.5	0.0	7.4	29.6
14-16	70.6	16.7	7.7	2.0	3.0	47.3	16.4	10.9	9.1	16.4
17-19	75.1	10.2	7.9	3.4	3.4	47.8	10.9	10.1	12.3	18.8
Other urban areas	79.4	11.2	5.8	2.1	1.6	54.3	11.0	8.9	9.6	16.3
5- 7	77.2	11.4	6.0	2.4	3.0	62.5	7.7	8.7	11.5	9.6
8-10	55.7	20.3	14.4	6.1	3.5	41.0	10.8	14.5	18.1	15.7
11-13	42.6	21.0	22.5	6.5	7.4	19.1	16.9	16.9	20.2	27.0
14-16	42.4	28.5	17.1	7.6	4.4	26.0	12.8	15.3	17.9	28.1
17-19	34.0	32.0	18.0	10.0	6.0	22.0	14.0	15.0	24.0	25.0
Rural	52.1	20.9	16.1	6.1	4.8	31.4	12.6	14.3	19.0	22.6

Table 15: Hours a Week Spent by Females in Household Work by Region

	Weekly Hours Worked									
	In-school youths					Out-of-school youths				
Age	0	1-14	15-28	29-42	42+	0	1-14	15-28	29-42	42+
5- 7	56.1	42.4	1.4	0.0	0.0	50.0	25.0	25.0	0.0	0.0
8-10	23.4	69.0	5.9	0.8	0.8	16.7	83.3	0.0	0.0	0.0
11-13	11.0	64.3	22.0	1.8	0.9	16.7	83.3	0.0	0.0	0.0
14-16	9.1	55.9	26.4	5.0	3.6	6.7	60.0	13.3	0.0	20.0
17-19	6.3	46.8	29.1	15.2	2.5	9.0	26.9	25.6	17.9	20.5
Lima	19.2	57.7	17.3	4.2	1.6	12.4	37.2	21.2	12.4	16.8
5- 7	49.1	46.1	3.9	0.9	0.0	36.1	55.6	5.6	2.8	0.0
8-10	20.1	65.9	11.7	2.0	0.3	11.5	69.2	11.5	3.8	3.8
11-13	9.7	66.1	17.7	5.6	0.9	18.5	55.6	18.5	0.0	7.4
14-16	6.7	52.5	29.4	9.7	1.7	8.8	28.1	26.3	24.6	12.3
17-19	9.6	38.4	31.6	14.7	5.6	5.8	27.3	25.2	20.9	20.9
Other urban areas	18.2	56.3	18.2	5.9	1.4	11.9	37.5	21.1	15.8	13.7
5- 7	32.3	58.7	7.8	0.6	0.6	37.5	54.8	4.8	1.9	1.0
8-10	12.5	67.5	15.5	3.2	1.3	8.4	66.3	15.7	6.0	3.6
11-13	6.8	62.7	22.2	5.9	2.5	4.4	52.2	23.3	16.7	3.3
14-16	7.6	58.2	22.2	8.9	3.2	9.7	34.2	30.6	19.9	5.6
17-19	10.0	56.0	22.0	10.0	2.0	6.9	26.7	36.1	19.8	10.4
Rural areas	13.0	62.8	17.6	4.7	1.9	12.3	41.5	25.5	15.0	5.8

Conclusions

Since the mid-50s the government of Peru's education policies have been designed to raise skill levels and make education available to broader segments of the population. Those policies rested primarily on expanding the

number of schools. As a result school enrollment rates and attainment levels rose. But an apparent preference to educate sons more than daughters meant that male schooling levels rose more quickly than female schooling levels. For females, especially those in rural areas, these policies were not sufficient to bring girls' schooling even with male levels. This was particularly true in rural areas. Better provision of such school inputs as textbooks as well as a change in attitudes and better economic opportunities for educated women appear to have been important in strengthening the demand for educating rural girls.

Parents' years of schooling and their occupations were significant determinants of educational levels. The impact of these socioeconomic factors lessened over time as the number of schools expanded and primary education became more available. The relative effect of parents' education differed daughters' and sons' schooling. In our adult sample, both parents' education had strong positive effects on daughters; for sons, the father's education had twice as large an effect as the mother's education. In the youth sample, the mothers' education had a stronger effect on their daughters' education. These differential effects reflect a preference on the part of fathers to send their sons to school, while mothers partly counterbalanced this preference.

Educational policies in Peru have reduced the direct costs associated with going to school. Time allocation patterns reveal, however, that the opportunity cost of school attendance to the family could be an effective barrier to further improvements in school enrollment and continuation rates. Even at a young age, girls, especially in rural families,

participate in labor market activities and also contribute substantially to productive work at home. School quality, measured crudely by the supply of textbooks and the number of teachers, appears to have a positive effect on the schooling of females. These findings suggest the direction of future intervention programs.

Textbooks at the primary level contributed to raising enrollment and schooling levels. In our adult sample women who had a textbook for their own use in primary school attained over half a year more schooling than those who did not. This positive effect is noted among young students as well.

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15/ Education data in the World Bank data bases are supplied by UNESCO.

APPENDIX A

Table A.1: Trends In Peruvian Education: Selected Indicators, 1950-1980 (in thousands)

	1950	1955	1960	1965	1970	1975	1980
Primary							
Schools	10.5	11.2	14.2	18.5	18.4	19.7	20.8
Teachers	23.2	28.2	38.5	53.1	66.0	72.6	84.4
Student enrolled	1,010	1,128	1,358	1,901	2,341	2,841	3,161
Percent female	40	41	44	45	46	47	48
Secondary							
Teachers	5.4	9.0	15.8	22.3	31.6	34.1	45.1
Students enrolled	72.5	112.2	174.8	324.5	546.2	813.5	1,152
Percent female	35	37	40	41	43	44	45
Postsecondary							
Universities 1/	8	9	10	27	31	33	43
Faculty	2.5	2.5	3.1	.	11.7	13.2	18.3
Students enrolled	17.4	20.2	35.0	80.1	133.6	216.5	290.8
Percent female	23	17	29	34	34	32	35
Enrollment Ratios							
Primary enrollment as a percent of population aged 6-11							
Males	100	95	98	111	114	119	117
Females	69	65	77	93	99	108	111
Secondary enrollment as a percent of population aged 7-12							
Males	9	12	16	25	34	42	53
Females	5	7	11	18	27	35	46
Tertiary enrollment as a percent of population aged 18-22							
Males	4	4	6	10	14	20	22
Females	1	1	2	5	8	10	12

Sources: Ministerio de Planificación; World Bank 1988.

1/ Figure includes private and state universities only. Faculty and student totals include all postsecondary institutions.

APPENDIX A

Table A.2: Sample Distribution By Gender, Cohort, and Region

Females								
Birth year		1925-39	1940-44	1945-49	1950-54	1955-59	1960-66	All
All regions	Number	1,306	619	715	808	907	1,289	5,644
	Row %	23.1	11.0	12.7	4.3	16.1	22.8	100
Lima	Number	343	193	205	252	316	431	1,740
	Row %	19.7	11.1	11.8	4.5	18.2	24.8	100
	Column %	26.3	31.2	28.7	1.2	34.8	33.4	30.8
Other urban areas	Number	380	150	221	246	293	406	1,696
	Row %	22.4	8.8	13.0	4.5	17.3	23.9	100
	Column %	29.1	24.2	30.9	0.4	32.3	31.5	30.0
Rural areas	Number	583	276	289	310	298	452	2,208
	Row %	26.4	12.5	13.1	4.0	13.5	20.5	100
	Column %	44.6	44.6	40.4	8.4	32.9	35.1	39.1

Males								
Birth year		1925-39	1940-44	1945-49	1950-54	1955-59	1960-66	All
All regions	Number	1,265	582	654	712	812	1,216	5,241
	Row %	24.1	11.1	12.5	13.6	15.5	23.2	100
Lima	Number	323	165	180	241	286	405	1,600
	Row %	20.2	10.3	11.3	15.1	17.9	25.3	100
	Column %	25.5	28.4	27.5	33.8	35.2	33.3	30.5
Other urban areas	Number	359	147	188	219	253	392	1,558
	Row %	23.0	9.4	12.1	14.1	16.2	25.2	100
	Column %	28.4	25.3	28.7	30.8	31.2	32.2	29.7
Rural areas	Number	583	270	286	252	273	419	2,083
	Row %	28.0	13.0	13.7	12.1	13.1	20.1	100
	Column %	46.1	46.4	43.7	35.4	33.6	34.5	39.7

Table A.3: Means and Standard Deviations of Variables: Adult Females

Birth cohort:	1925-1939		1940-1944		1945-1949		1950-1954		1955-1959		1960-1966	
Variable	Mean	std	Mean	std	Mean	std	Mean	std	Mean	std	Mean	std
YEARS OF SCHOOLING	3.123	3.83	3.667	4.19	4.815	4.59	6.006	4.92	6.977	4.58	7.603	3.98
MOTHER'S YEARS OF SCHOOLING	1.532	2.65	1.683	2.85	2.006	2.95	2.593	3.28	2.839	3.39	3.100	3.43
FATHER'S YEARS OF SCHOOLING	2.560	3.62	2.767	3.44	3.249	3.69	3.926	3.83	4.342	3.78	4.777	4.11
LIVED WITH MOTHER AT AGE 10	0.859	0.35	0.868	0.34	0.853	0.35	0.879	0.33	0.902	0.30	0.936	0.24
LIVED WITH FATHER AT AGE 10	0.750	0.43	0.753	0.43	0.761	0.43	0.786	0.41	0.800	0.40	0.845	0.36
MOTHER IS A WHITE-COLLAR WORKER	0.047	0.21	0.069	0.25	0.071	0.26	0.115	0.32	0.139	0.35	0.168	0.37
MOTHER IS A BLUE-COLLAR WORKER	0.089	0.28	0.095	0.29	0.074	0.26	0.093	0.29	0.109	0.31	0.147	0.35
MOTHER HAS NO JOB	0.436	0.50	0.391	0.49	0.488	0.50	0.394	0.49	0.356	0.48	0.199	0.40
MOTHER'S OCCUPATION IS MISSING	0.054	0.23	0.060	0.24	0.073	0.26	0.089	0.29	0.108	0.31	0.160	0.37
FATHER IS A WHITE-COLLAR WORKER	0.137	0.34	0.129	0.34	0.147	0.35	0.167	0.37	0.191	0.39	0.206	0.40
FATHER IS A BLUE-COLLAR WORKER	0.149	0.36	0.183	0.39	0.213	0.41	0.224	0.42	0.288	0.45	0.310	0.46
FATHER'S OCCUPATION IS MISSING	0.030	0.17	0.026	0.16	0.039	0.19	0.043	0.20	0.039	0.19	0.043	0.20
LIVED IN A CITY AT AGE 8	0.265	0.44	0.281	0.45	0.322	0.47	0.382	0.49	0.437	0.50	0.479	0.50
LIVED IN A CITY AT AGE 13	0.281	0.45	0.315	0.46	0.362	0.48	0.436	0.50	0.477	0.50	0.504	0.50
HAD READING AND/OR MATH BOOK(S)	0.384	0.49	0.459	0.50	0.534	0.50	0.632	0.48	0.723	0.45	0.793	0.41
NUMBER OF GRADES IN SCHOOL	4.918	0.60	4.872	0.61	4.920	0.46	4.902	0.48	4.947	0.37	4.972	0.27
SCHOOL HAD FURNITURE	0.502	0.50	0.582	0.49	0.662	0.47	0.754	0.43	0.819	0.39	0.867	0.34
SCHOOL SERVED FREE FOOD	0.091	0.29	0.150	0.36	0.221	0.42	0.337	0.47	0.398	0.49	0.407	0.49
NUMBER OF TEACHERS IN SCHOOL	3.472	6.22	3.911	5.07	4.599	5.05	6.006	5.94	7.020	6.28	8.263	7.12

Table A.4: Means and Standard Deviations of Variables: Adult Males

Birth cohort:	1925-1939		1940-1944		1945-1949		1950-1954		1955-1959		1960-1966	
Variable	Mean	std	Mean	std	Mean	std	Mean	std	Mean	std	Mean	std
YEARS OF SCHOOLING	4.838	4.18	5.897	4.63	6.780	4.55	8.257	4.46	8.707	4.01	8.248	3.37
MOTHER'S YEARS OF SCHOOLING	1.558	2.75	1.735	2.72	1.959	3.02	2.617	3.42	2.835	3.44	3.059	3.39
FATHER'S YEARS OF SCHOOLING	2.515	3.44	2.890	3.44	3.194	3.49	4.058	4.00	4.340	3.94	4.731	4.02
LIVED WITH MOTHER AT AGE 10	0.843	0.36	0.835	0.37	0.856	0.35	0.914	0.28	0.925	0.26	0.940	0.24
LIVED WITH FATHER AT AGE 10	0.743	0.44	0.741	0.44	0.755	0.43	0.803	0.39	0.841	0.36	0.863	0.34
MOTHER IS A WHITE-COLLAR WORKER	0.053	0.22	0.077	0.27	0.090	0.29	0.121	0.32	0.128	0.33	0.171	0.38
MOTHER IS A BLUE-COLLAR WORKER	0.076	0.27	0.082	0.28	0.087	0.28	0.096	0.29	0.090	0.28	0.124	0.33
MOTHER HAS NO JOB	0.469	0.50	0.469	0.50	0.448	0.49	0.389	0.48	0.331	0.47	0.187	0.39
MOTHER'S OCCUPATION IS MISSING	0.031	0.17	0.043	0.20	0.052	0.22	0.105	0.30	0.145	0.35	0.168	0.37
FATHER IS A WHITE-COLLAR WORKER	0.128	0.33	0.155	0.36	0.149	0.36	0.192	0.39	0.192	0.39	0.209	0.41
FATHER IS A BLUE-COLLAR WORKER	0.169	0.38	0.201	0.40	0.215	0.41	0.270	0.44	0.302	0.45	0.325	0.47
FATHER'S OCCUPATION IS MISSING	0.022	0.15	0.036	0.19	0.024	0.16	0.043	0.20	0.045	0.20	0.040	0.20
LIVED IN A CITY AT AGE 8	0.269	0.44	0.285	0.45	0.325	0.47	0.396	0.48	0.431	0.49	0.465	0.50
LIVED IN A CITY AT AGE 13	0.309	0.46	0.339	0.47	0.383	0.49	0.445	0.49	0.474	0.50	0.493	0.50
HAD READING AND/OR MATH BOOK(S)	0.540	0.50	0.596	0.49	0.642	0.48	0.742	0.44	0.815	0.39	0.846	0.36
NUMBER OF GRADES IN SCHOOL	4.770	0.93	4.723	0.84	4.841	0.65	4.919	0.46	4.931	0.41	4.948	0.37
SCHOOL HAD FURNITURE	0.693	0.46	0.761	0.43	0.803	0.40	0.869	0.34	0.893	0.31	0.915	0.28
SCHOOL SERVED FREE FOOD	0.125	0.33	0.235	0.42	0.320	0.47	0.426	0.49	0.394	0.49	0.393	0.49
NUMBER OF TEACHERS IN SCHOOL	4.402	5.06	5.227	5.96	6.083	6.64	6.954	6.00	8.139	6.97	8.706	7.31

APPENDIX B

Figure 1A
Enrollment in Primary School,
1950-1980

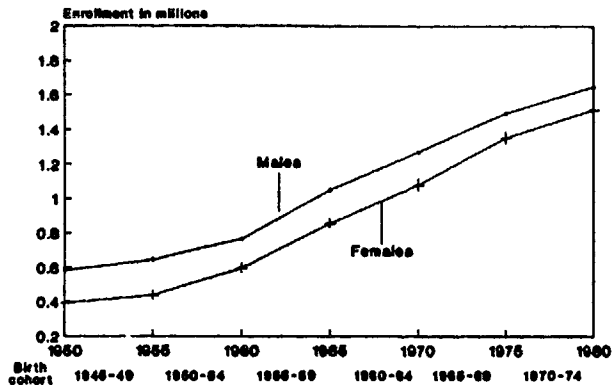


Figure 1B
Primary Enrollment as a Percent of
the Population 6-11 Years Old, 1950-1980

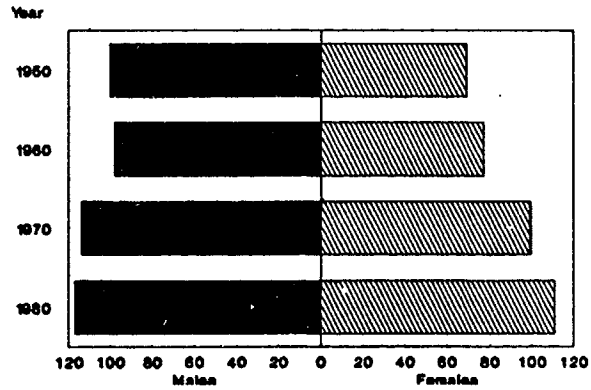


Figure 2A
Enrollment in Secondary School,
1950-1980

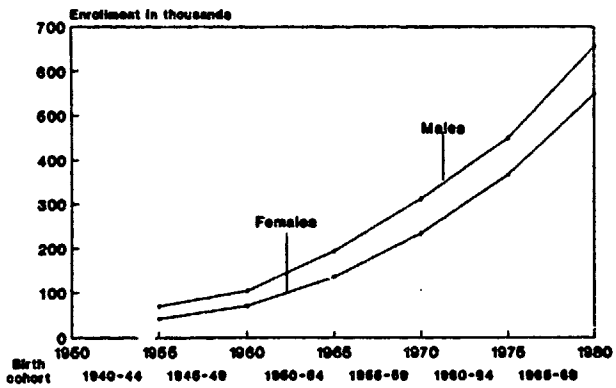


Figure 2B
Secondary Enrollment as a Percent of the
Population 12-17 Years Old, 1950-1980

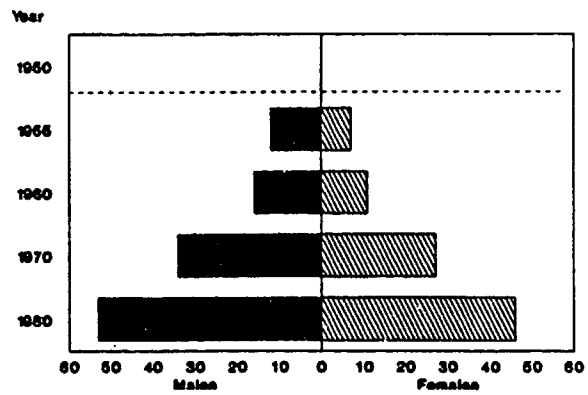


Figure 3A
Enrollment in Tertiary Institutions,
1950-1980

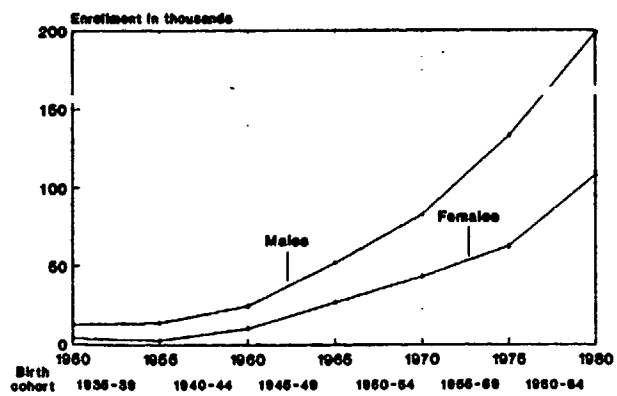
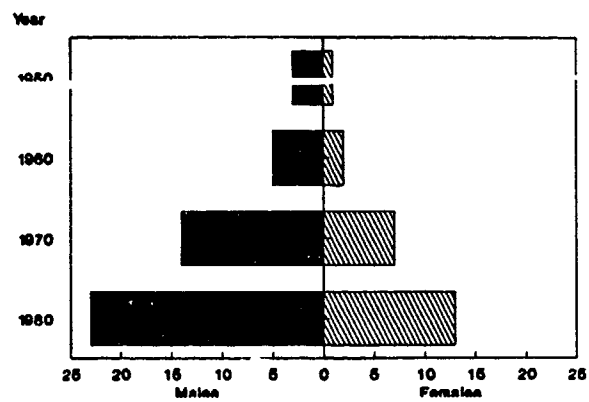


Figure 3B
Tertiary Enrollment as a Percent of the
Population 20-24 Years Old, 1950-1980



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