Exclusion, Gender and Education

Case studies from the developing world

A companion volume to *Inexcusable Absence*

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The Center's president works with the Board, the Advisory Committee, and the Center's senior staff in setting the research and program priorities, and approves all formal publications. The Center is supported by an initial significant financial contribution from Edward W. Scott Jr. and by funding from philanthropic foundations and other organizations.

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Preface

At the Center for Global Development we aim to stimulate new thinking on longstanding development problems, particularly problems for which it is possible to imagine how a change in attitudes or practices in the rich world could improve lives in the poor world. The problem of children, especially girls, failing to attend school, is a classic one. No one disagrees that girls ought to go to school—for their own sake and because educating girls ensures a better future for their children and their societies. Many donors express a willingness to finance increased access to better schooling, especially for girls. There is universal support for the Millennium Development Goal of universal primary education by 2015. And in fact, progress in expanding education in developing countries has been impressive in the last two decades and girls have benefited as enrollment rates, especially in primary schooling, have increased dramatically.

But the limits of standard approaches to achieving near-universal education (building more schools, training more teachers, providing essential learning materials) are evident. More than 75 million children are not enrolled in school or are not attending school regularly; many who attend learn little and fail to complete primary school. One worrying example of that reality: in some countries primary school enrollment among girls who are members of excluded groups—social *minorities*—is below 50 percent.

One year ago we published a book by Maureen Lewis (a then senior fellow at the Center) and Marlaine Lockheed,

Inexcusable Absence: Why 60 Million Girls Still Aren't In School and What to Do About It, which illuminated this simple but stunning fact: three-quarters of girls who are not attending school around the world are members of groups that are socially marginal or excluded in the country where they live. That book set out practical approaches to address the problem, including anti-discrimination programs, cash grants to families to increase the demand for schooling in social groups where demand is low, and special efforts to improve the quality and outreach of schools in marginalized communities.

This new book, edited by Lewis and Lockheed, includes the more detailed technical analysis and the country case studies on which much of *Inexcusable Absence* is based. The technical analysis addresses the role of ethnic and linguistic heterogeneity in explaining differences across countries in school enrollment. The case studies cover heterogeneous countries—Lao PDR (Hmong Hill Tribes), China (ethnic minorities), Pakistan (Balouchi and other isolated tribes in outlying provinces), India (scheduled castes and scheduled tribes), and Guatemala (indigenous groups)—where girls from minority groups are especially disadvantaged. They also cover two homogenous countries—Bangladesh and Tunisia—where both NGO and government programs have successfully changed attitudes and behavior surrounding girls' education with the result that both countries have reached parity in education.

At the Center for Global Development we have taken a special interest in the problem of education in the developing world and the particular challenges faced by girls. One of our earliest books (Samuel Morley and David Coady, *From Social Assistance to Social Development: Targeted Education Subsidies in Developing Countries*) highlighted the benefits of conditional cash transfers for poverty alleviation and for education. In 2003–2004 I co-chaired the United Nations Millennium Project Task Force on Education, which focused on new ways to increase demand for schooling where poverty and culture limit parents' demand and to improve the supply of schooling where poor public policy and limited capacity are constraints. In that work we emphasized the need for much more attention to the role of incentives and institutions within countries.

I am delighted that in *Inexcusable Absence* and this new book, Lewis and Lockheed have defined a heretofore neglected part of the larger challenge: girls in socially excluded groups. They provide ideas for an agenda that ought to be taken up eagerly—by the countries themselves covered in this volume, and by the donor community, which has promised that money (and it is not a great amount) will not be the constraint to every child in the developing world, girl or boy, minority or majority group member, completing primary school.

In doing our work on girls' education, we have benefited from the special support and encouragement of two of our Board members, Belinda Stronach, a former Member of Parliament in Canada, and our Board Chair, Edward W. Scott, Jr. Both are deeply committed to improving the status of women in the developing world. Preparation and publication of the book and briefing materials was made possible

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Raquel Gomes (Oxfam), as a post-doctorate fellow at the Center for Global Development, undertook background research, and Lara Iverson, as a consultant to CGD, provided support on the anthropological issues. Bilal Siddiqi of CGD provided expert research assistance throughout the process. We also wish to thank the authors of the various chapters, whose enthusiasm for this project and willingness to endure multiple revisions of their work made this book possible.

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Social exclusion: The emerging challenge in girls' education

Maureen A. Lewis and Marlaine E. Lockheed

Developed and developing countries alike have recognized the importance of girls' education: the worldwide surge in girls' primary school enrollment over the past two decades is testament to their commitment. The growth in girls' schooling also coincides with the global trend toward mass education that took off after the end of World War II and accelerated in the postcolonial period. Over the past 60 years, most countries have adopted mass education and have accelerated school expansion to accommodate the growing demand for education (Baker and LeTendre 2005). Particular attention has been given to girls' schooling, not only because of its importance in reaching universal education but also because of its demonstrated social benefits.

In much of the world, girls have reached education parity with boys, at both primary and secondary levels, and in some countries—principally in Latin America and the Caribbean and the oil-exporting regions of the Middle East—girls' participation at the secondary level exceeds that of boys. More than half of developing countries had achieved gender parity in primary school by 2002 (table 1.1). At the secondary level, girls' participation lags boys' participation in 46 developing countries, exceeds that of boys in 29 developing countries, and is at parity in the remaining 38 developing countries for which data are available (UNESCO 2005).

Our thanks to James Habyarimana, Public Policy Institute, Georgetown University, and to Caren Grown, Co-Director, Levy Center, Bard College for helpful comments.

Table 1.1. Prospects for achieving gender parity in primary and secondary education in 2005 and 2015

		Gender parity in secondary education		
		Achieved in 2002	**Likely to be achieved by 2015**	**At risk of not achieving the goal by 2015**
Gender parity in primary education	**Goal achieved in 2002 (gross primary enrollment of 0.97–1.03)**	Albania, Armenia, Azerbaijan, Barbados, Belarus, Bulgaria, Chile, China, Croatia, Cyprus, Czech Republic, Ecuador, Georgia, Hungary, Indonesia, Jamaica, Jordan, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia FYR, Mauritius, Moldova, Oman, Romania, Russian Federation, Serbia and Montenegro, Seychelles, Slovak Republic, Slovenia, Ukraine, Uzbekistan	**Argentina, Belize,** Bolivia, **Botswana,** Guyana, Kenya	**Bangladesh, Colombia, Costa Rica, Dominican Republic, Lesotho, Malaysia, Maldives,** Mauritania, **Mexico, Mongolia,** Myanmar, **Namibia, Nicaragua, Palestinian Autonomous Territories,** Peru, **Philippines,** Poland, Rwanda, **Samoa, St. Lucia, St. Vincent and the Grenadines, Suriname,** The Gambia, **Tonga, Trinidad and Tobago,** Uganda, **Vanuatu, Venezuela,** Zimbabwe
	Goal likely to be achieved by 2015	Cuba, Estonia	Egypt, Ghana, Iran, Saudi Arabia	**Brazil,** India, **Lebanon,** Nepal, **Panama,** Senegal, Syrian Arab Republic, Tajikistan, Togo, **Tunisia,** Zambia
	At risk of not achieving goal by 2015	El Salvador, Paraguay, Swaziland	Cameroon, South Africa, Vietnam	**Algeria,** Benin, Burkina Faso, Burundi, Cambodia, Chad, Comoros, Côte d'Ivoire, Djibouti, Eritrea, Ethiopia, Guatemala, Lao PDR, Malawi, Mali, Morocco, Mozambique, Niger, Pakistan, Papua New Guinea, Sudan, Turkey, Yemen
Number of countries		38	12	63

Note: Prospects for achieving gender parity are assessed on the basis of trend projections of the gross enrollment rate in primary and secondary education, by gender, for 2005 and 2015, consistent with the formulation of the gender goal. Countries shown in bold are those in which enrollment disparities at the expense of boys are observed at both primary and secondary levels.

Source: UNESCO (2005).

The countries lagging on girls' education include both those that trail in educating all children and also countries in which women have historically been marginalized.[1] But girls' education lags that of boys in some countries for a third reason: the interaction between gender and culture. In such countries girls who belong to marginalized groups, such as the Hill Tribes in Southeast Asia, indigenous and Afrodescendent populations in Latin America, the lowest castes in India and Nepal, or the Roma in Eastern Europe, suffer disproportionately in education relative to the mainstream population and to boys in their own linguistic or ethnic group. Lewis and Lockheed (2006) estimate that these excluded girls make up more than 70 percent of the millions of out-of-school girls in the developing world. The importance of ethnic and linguistic divisions, their determinants, and the impact on girls' schooling is the subject of this volume of studies. Recent global assessments of education have noted that rural children, low-income children, and children from ethnic minorities are at risk. Some of these assessments have provided estimates of out-of-school children by gender, location, and income (World Bank 2005b; UIS 2005; Wils, Carrol, and Barrow 2005; Lloyd 2005; Birdsall, Levine, and Ibrahim 2005). However, the interaction between gender and these cultural categories has rarely been examined. Hampered by limited data and lack of comparable definitions and measures, the issues surrounding excluded girls and schooling have been recognized but not addressed.

The chapters in this volume represent a first effort to strengthen the analytic underpinnings of the subject. They present cross-country and national evidence on the determinants of school participation and achievement of excluded girls. They go beyond earlier one-way breakdowns looking at participation and achievement only through the lens of location, income, ethnicity, or language to look at the two-way interaction between gender and exclusion. This volume focuses directly on the differential effects of being female within excluded groups.

The chapters also look at family and school characteristics that differentially affect excluded girls' participation and performance. They confirm the importance of mothers' education in girls' school enrollment and the importance of school quality in retention and achievement. School quality, however, also emerges as important in creating the demand for education, with higher demand expressed for better schools. Earlier research in countries as diverse as Peru (McEwan 2004) and Malawi (Dowd 2001) have demonstrated how improvements in school quality have led to higher enrollment and retention rates. The chapters in this volume contribute to this literature.

This chapter defines exclusion, synthesizes the evidence—relying heavily on the case studies—and undertakes cross-country analyses of ethnicity and gender and their relationships with school participation and learning. Drawing on recently available data and information, each of the chapters explores a different facet of exclusion and its impact on girls' education. Chapters 2 through 6 present case studies from

1 Many countries in the first group are in Sub-Saharan Africa. In Burkina Faso and Niger, for example, gender parity may arrive before universal enrollment.

countries with large ethnic and linguistic minorities—Lao PDR, China, Pakistan, India, and Guatemala—that illuminate these interaction effects. Chapters 7 and 8, on Bangladesh and Tunisia, analyze achievements of two of the world's most homogeneous countries, both with few if any minority ethnic or linguistic groups. Together with the Republic of Korea (categorized as the most homogeneous country), they have experienced the sharpest increases in girls' educational attainment in the shortest period among developing countries (Alesina et al. 2003).

In chapter 2 Elizabeth King and Dominique van de Walle analyze the first national household survey from Lao PDR, with a focus on the minority populations that make up 33 percent of the population. Enrollment of urban girls is 91 percent, but just 46 percent of rural girls in ethnic minority communities are in school. The case study examines the gender, ethnic, and socioeconomic determinants of school access and school attendance.

Although China is rapidly approaching universal primary education, progress on secondary enrollment is uneven across gender and income. In chapter 3 Emily Hannum and Jennifer Adams examine the reasons for this and the role of aspirations, school performance, and the school environment in keeping children in school. They draw on two rounds of the Gansu Survey of Children and Families (in 2000 and 2004), a multisite survey that interviewed 2,000 students, parents, and schools in rural Gansu Province, one of China's poorest regions.

In chapter 4 Cynthia Lloyd, Cem Mete, and Monica Grant assess the disadvantage of girls in school enrollment and explore correlates of girls' schooling. They use a longitudinal survey that followed nearly 600 women from 1997 to 2004 in 12 rural villages in Northwest Frontier and Punjab provinces of Pakistan and a nationally representative survey of adolescents and youth in 2001/02. The authors find that as of 2002, fewer than 60 percent of girls 10–14 had ever attended school and that rural girls are much less likely to attend school than their urban counterparts. Indeed, Pakistan lags far behind the other countries included in this volume, continuing to struggle to reach universal primary schooling while the other countries are turning their focus to the challenge of lower secondary.

In chapter 5 on India Kin Bing Wu, Peter Goldschmidt, Christy Kim Boscardin, and Mehtab Azam analyze gender, caste, and tribal differences in school enrollment and performance in both primary and secondary school. They analyze ninth-grade math and science achievement in two large states in India, drawing on a recent survey of 3,418 students in Rajasthan and 2,856 students in Orissa. On average girls scored significantly lower than boys in both states. The authors examine features of teachers and schools that serve to reduce the gap between the performance of girls and boys as well as the gap between the performance of students from scheduled castes and scheduled tribes on the one hand and majority students on the other. They find that girls' achievement is positively correlated with opportunities to learn and with basic school inputs, such as textbooks.

In chapter 6 Kelly Hallman and Sara Peracca rely on a rich household survey from Guatemala, a Latin American country with a large indigenous population and

one that is lagging behind the rest of the region in education, to analyze the determinants of enrollment and school attainment of excluded girls. At age seven, only 54 percent of indigenous girls are enrolled in school. The figure is far lower than the 71 percent of indigenous boys and 75 percent of nonindigenous girls enrolled. The authors also explore school dropout, child labor, and poverty.

Chapters 7 and 8 discuss two stellar performers in girls' education, Bangladesh and Tunisia. In chapter 7 Sidney Ruth Schuler provides results from 15 years of in-depth, anthropological interviews with men and women in three Bangladeshi communities to understand the evolving perceptions of and demand for female education. These factors influenced the observed shifts in women's roles, family perceptions of education, educational aspirations, and employment opportunities that shaped the behavior changes underlying the sharp rise in girls' primary and secondary enrollment. Bangladesh has attained a primary school enrollment rate of 84 percent, with the highest rate (87 percent) among rural girls. Girls' enrollment overtook that of boys in 2004.

In chapter 8 Marlaine Lockheed and Cem Mete examine school participation at the secondary level in Tunisia, which achieved a 96 percent net female primary enrollment rate as early as 1996, as an outcome of strong central policies requiring school participation. They draw on three data sets, a household and school matching survey, a school survey, and national administrative records of student performance on primary school leaving examinations, which they match at the school level to explore reasons for the observed gender equity at the primary level and the emergence of gender inequalities at the secondary level. They focus on the disadvantaging aspects of high-stakes selection examinations at the end of primary school in determining girls' subsequent school participation.

Social exclusion and education

The concept of social exclusion emanated from European dissatisfaction with perceived failures of the welfare system in the face of persistent poverty and slow economic growth in the early 1990s. It mirrors concern in the late 1970s in the United States regarding the emergence of an underclass that appeared unable to climb out of poverty. The socially excluded are those who receive inadequate support from public institutions and whose opportunities remain constrained due to structural and cultural factors.

Exclusion arises from multiple sources, some endogenous and some exogenous. Social exclusion from immutable factors, such as gender, ethnicity, and race, contributes to low educational participation for girls and members of subgroups. Social exclusion from external factors, such as poverty, contributes to low educational participation and to a cycle of exclusion based on poverty. Concatenating factors of exclusion lead to what is often called multiple exclusion.

Social exclusion of groups is rare, albeit not unknown, in homogeneous societies (Meerman 2005). It is common in heterogeneous, stratified societies, across ethnic groups, languages, and customs, with groups sometimes separated by geography. What distinguishes social exclusion from simple separatism are the invidious social evaluations (in terms of differences in honor, respect, esteem, and the like) that are accorded the excluded group by a dominant social group and that may even be shared by the excluded group (box 1.1). These evaluations lead to differences in expectations for a range of behaviors, including those related to education. In many parts of the world, exclusion reflects a history of colonization or enslavement, as that by European colonists in North and South America, Africa, and Asia that created the excluded groups of Native Americans and blacks in the United States and the Maori in New Zealand, among others. Ethnic populations or subgroups whose mother tongue is distinct from a national official language often remain outside the mainstream economy and society.

Guatemala, India, Lao PDR, and Pakistan all have "ranked" linguistic and ethnic subgroups that lag economically and socially behind the majority population (Meerman 2005; Lewis and Lockheed 2006). Subsistence agriculture and geographic isolation effectively separate certain groups from the mainstream society, but as development occurs, these communities inevitably come in contact with the larger society, which accords them less respect than it gives to the majority population. Traditional status hierarchies, such as caste rankings in India and Nepal, lead to exclusion of those lower in the hierarchy by those higher in the hierarchy. In some societies poverty has significance that goes beyond simple economic well-being to include disparagement

Box 1.1. What are socially excluded groups?

Socially excluded groups are defined as cultural subgroups that are marginalized due to one or more of the following phenomena:

Stigmatization by recent historical trauma at the hands of the majority population (for example, a history of slavery or dispossession of a homeland).

Ethnic differences, including differences in ethnic group, language, and religion.

Low status, such as caste, as excluded groups are "ranked" or subordinated in the social hierarchy below the majority population.

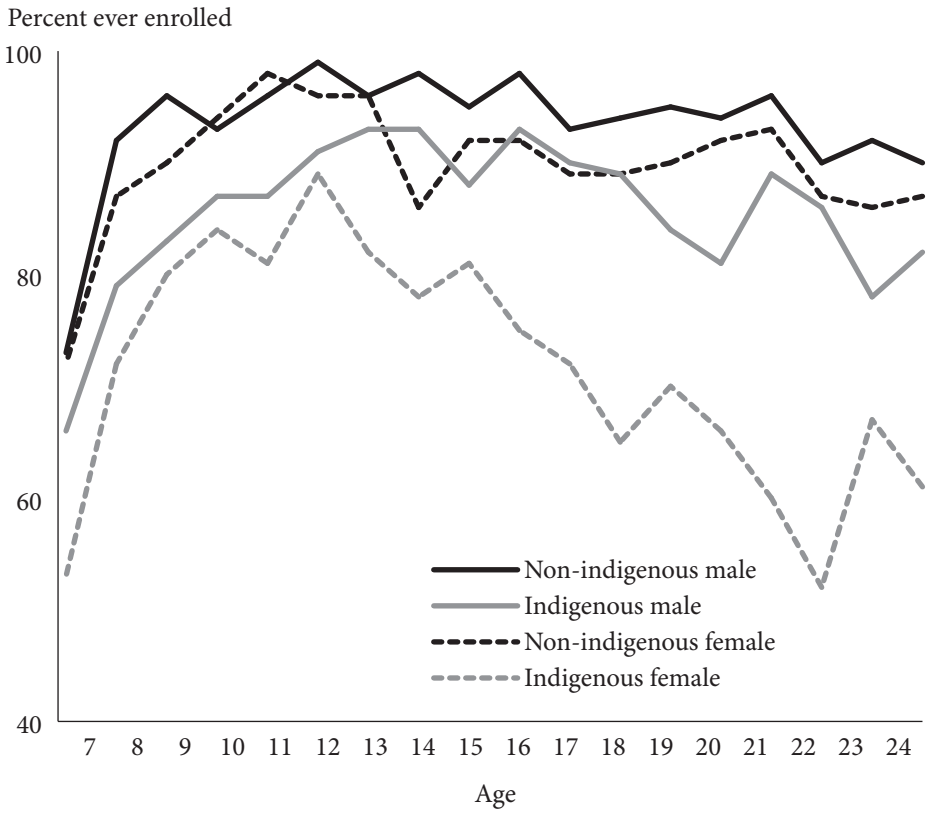
Involuntary minority status (in contrast to immigrant groups that are voluntary minorities) (Meerman 2005).

Social exclusion sidelines certain population groups, preventing them from receiving the social rights and protections meant to be extended to all citizens and restricting their economic mobility. Discrimination against such groups by the majority population excludes them to varying degrees from mainstream activities, such as education and employment.

and marginalization of the poor by the wealthy, perpetuating the cycle of poverty due to limited economic and social mobility.

Girls in excluded groups suffer not only as members of the excluded group but also as girls. Whether exclusion is additive or multiplicative is not known. Some sociological research suggests that it is additive (Ridgeway and Erickson 2000; Ridgeway 1991), and the studies in this volume provide limited evidence of interaction effects. All studies indicate a severe education disadvantage from multiple sources of exclusion: girls from impoverished families, girls from tribal, ethnic, or linguistic "minority" communities, girls living in remote settings, and girls from lower castes are less likely to participate in education and more likely to stay in school only briefly if they enroll at all (Lewis and Lockheed 2006). The extent of their disadvantage can be seen in primary schooling figures across

Figure 1.1. Guatemala school enrollments by gender and age, 2000

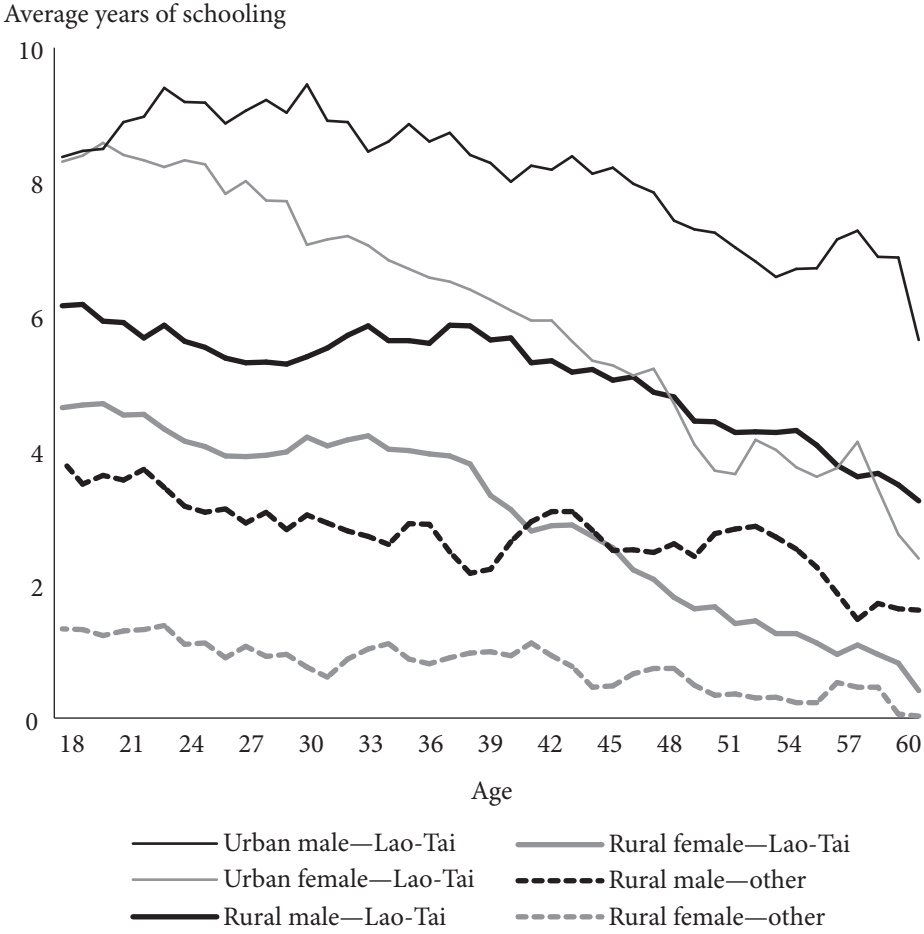


Note: Weighted means.

Source: Hallman and Perraca, this volume.

age, gender, ethnicity, and location in Guatemala and Lao PDR (figures 1.1 and 1.2). The schooling of all children is improving, but indigenous girls, especially those living in remote communities, still lag well behind the others. It is this population that needs to be reached if gender parity and universal education goals are to be realized.

Figure 1.2. Average years of schooling among population 18–60 in Lao PDR, by gender, ethnicity, and location, 2002/03



Note: Figures represent three-age moving average. Data for the urban non–Lao-Tai population are not plotted because of small sample size. Because the number of observations dwindles with age due to mortality, only data for those up to 60 are plotted. Lao-Tai are majority.

Source: King and van de Walle, this volume.

Evidence on exclusion and schooling in developing countries

Very few country studies have taken up the combined issue of gender, exclusion, and schooling, although interest is growing because the excluded are increasingly the target population for ensuring universal schooling. The chapters in this volume bring fresh perspectives to the topic. The review here draws on country studies on Bangladesh (chapter 7 of this volume); Bolivia (Jimenez 2004); China (Hannum 2002); Gansu Province, China (chapter 3 of this volume); Ecuador (Garcia Aracil and Winkler 2004); Guatemala (chapter 6 of this volume; Edwards and Winkler 2004); India (chapter 5 of this volume); Lao PDR (chapter 2 of this volume); Mexico (de Janvry and Sadoulet 2006); Nepal (Stash and Hannum 2001); Pakistan (chapter 4 of this volume); Peru (Cueto and Secada 2004); Tunisia (chapter 8 of this volume); and Vietnam (van de Walle and Gunewardena 2001).

The UNESCO Institute of Statistics (UIS 2005) reanalyzed Demographic and Health Surveys from 68 countries to identify household and child correlates of child school attendance. All other factors held equal, girls were less likely to attend school than boys in 30 countries. Children in households from the lowest income quintile were less likely to attend school than children from higher income quintiles in 34 countries, and children of unschooled mothers were less likely to attend school than children whose mothers had any formal schooling in 63 countries (UIS 2005: table 5A.2).

The UIS undertook more detailed multivariate analyses of the probabilities of school attendance in Nigeria and India, adding information on the child's ethnicity—proxied by language for Nigeria and tribal status for India—along with controls for maternal and paternal education, household size, household wealth, region, religion (India only), caste status (India only), and urban/rural residence. From these analyses it is possible to compute the combined effect of gender and ethnicity on the probability of school attendance. They are substantial. In India tribal girls had a 9.4 percent lower probability of attending school than non-tribal boys. The size of the difference in India is about the same size as the difference between the probability of attending school in the most highly literate state (Kerala) and all other states. In Nigeria, Hausa-speaking girls had a 35.4 percent lower probability of attending school compared with Yoruba-speaking boys.

Demographic and Health Survey data sets report school attendance, which is only one indicator of school participation. Other indicators used in this volume include school enrollment, repetition, grade attainment, primary school completion, and transition to and completion of secondary school. Most studies examine more than one of these indicators.

A common thread across research findings is the distinct disadvantage of indigenous[2] girls in terms of enrolling and staying in school, even when controlling

2 This volume uses the term "indigenous" to include Native Americans and tribal groups in Asia and South Asia.

for other family characteristics. Indigenous children are less likely to enroll in school than nonindigenous children in virtually all studies that have considered this factor, and they are more likely to repeat a grade than nonindigenous children. In Bolivia, for example, the first grade repetition rate of indigenous children is 30 percentage points higher (43.4 percent) than that of nonindigenous children (13.7 percent). In India there has been marked progress in primary school enrollment of all children, including scheduled tribes and scheduled castes, over the last decade, and in 2005 only 6.9 percent of girls and 5.5 percent of boys were out of school. Nonetheless, roughly 50 percent more boys than girls attend secondary school.

Grade repetition often leads to dropout, fewer years of school attainment, and lower school completion rates; in many contexts retention in school is a more important signal than enrollment. Indeed, retaining children in school often poses a greater challenge than merely convincing parents to send their children to school. The evidence suggests significantly lower school retention for indigenous children, particularly girls. In Bolivia both Quechua- and Aymara-speaking indigenous girls are less likely to enroll in school and more likely to discontinue their schooling prematurely than nonindigenous girls or boys. The primary completion rate of indigenous children is lower (55 percent versus 81 percent for nonindigenous students). Controlling for residence and socioeconomic status, the school completion rate for indigenous girls in Guatemala is half that of Ladina girls and only one-third that of all boys. At age 16 only 25 percent of indigenous girls are in school, in contrast to 45 percent of indigenous boys and more than half of all Ladino children. When controlling for socioeconomic factors, ethnicity, and location, indigenous females are less likely to attend or complete primary school or enroll in secondary school, and indigenous males are less likely to ever attend or complete secondary school (chapter 6 of this volume). In Ecuador being indigenous raises the probability of rural dropout by almost 30 percent.

Indigenous communities tend to be isolated geographically, which affects not only whether a school is available in the community but also the quality of that school. In Vietnam restrictions on mobility and inequities in school provision lead to significantly less education among rural minorities. Absence of schools is also correlated with the absence of other essential infrastructure, such as roads and access to markets. In Lao PDR, so few indigenous hill-tribe families live in urban areas that the effects of isolation cannot be separated from indigeneity. However, the quality of schools is significantly higher in urban areas than in rural communities, where dilapidated schools (schools with leaking roofs and no electricity) discourage girls from enrolling. Moreover, the effect of isolation appears to be greater for girls than for boys: in Lao PDR girls who reside in the highlands and in disadvantaged "priority districts" are less likely to enroll in school than boys in the same communities. Location and schooling characteristics are thus key for minority girls but not for majority Lao-Tai children (chapter 2 of this volume).

In China the probability that Han children would enroll in primary school was higher than that of minority children in 1992, with about half the difference in the probability of enrolling due to differences in family background and county of residence. In rural counties where minorities accounted for roughly one-third of the population, minority participation rates were substantially lower than those of Han children. However, girls' participation was inconsistent across the minority groups. Among 10 minority ethnic groups, five were more likely to enroll girls in primary school, while four were less likely to do so. Among Han children and children from one minority group, no gender differences in enrollment were observed (chapter 3 of this volume).

In Guatemala children's school enrollment rates were no lower in rural areas than in urban areas, but rural residence was correlated with a higher age for primary school entry, lower grade for age, lower rate of primary completion, and lower secondary enrollment. In Ecuador the probability of primary school dropout was higher for girls in rural than in urban areas, and ethnicity was a factor explaining dropout from rural but not urban schools. Girls living in urban areas, whether indigenous or not, were 34 percent more likely to stay in school than males but 35 percent less likely to be in school than males in rural areas. The interaction of indigenous females with rural residence strengthens the negative effects on primary and secondary enrollment and depresses grade for age enrollment in Guatemala (chapter 6 of this volume).

In some countries, rural residence is confounded with other bases of exclusion (such as ethnicity, caste, tribe, and poverty), so that controlling statistically for these characteristics often completely eliminates the independent association between rural residence and school participation. The UIS analyses of household data from India (controlling for tribal and caste status as well as household wealth) and Nigeria (controlling for language as well as household wealth) found that rural children (including rural girls) were not at a disadvantage in attending school. In rural Pakistan girls' school attendance rates are 45 percentage points below those of boys in the lowest income group but only 15 points below boys in the highest income group, suggesting the greater importance of income in explaining school participation.

Lack of nearby schools in rural areas is often responsible for lower school participation. In several countries—Bolivia, Ecuador, and Peru—disparities in school attendance between urban and rural communities largely disappear when the availability of a local school is taken into account (Hall and Patrinos 2006). In a few countries, significant efforts have been made to provide schools in rural areas; these efforts have led to universal primary school participation in Indonesia, for example (Duflo 2000 and Jayasundera 2005). Efforts to improve the quality of the poorest performing schools have had spillover effects on rural schools attended by indigenous children in Chile, for example (McEwan 2006).

In many countries cultural factors work to remove rural and indigenous girls from school, particularly after primary school. Evidence from Guatemala suggests

that parental concerns over allowing adolescent girls to mix with boys overwhelm other reasons for keeping girls at home. In addition, school leavers often attribute their departure to disaffection or boredom with school, as in China, or to lack of interest, as in Guatemala (chapter 6 of this volume). Sentiments of parental concern for their daughters and children's dissatisfaction with school have been echoed in Mexico and Vietnam. They may help explain the difficulties associated with encouraging minority households to send their children, especially their daughters, to school.

Cultural factors should have been expected to play a role in reducing schooling for girls in Bangladesh, but unlike in other countries in South Asia (with the exception of Sri Lanka), girls no longer trail boys in education. This dramatic shift over the past two decades can be attributed to a number of factors. Its effects have altered cultural practices. Coeducational schools made universal education affordable. In contrast, the need for separate-sex schools in every village in Pakistan has restricted growth.

More important from the perspective of cultural shifts, educated Bangladeshi girls have become more desirable marriage partners and face less abuse from mothers-in-law and husbands than do illiterate wives. Their education—which enables them to earn an income—has become a substitute for a dowry. Education has given women greater access to the labor market and raised their value in the marriage market, improving their life chances and future well-being. This evidence shows that cultural shifts can and do occur, but they take time and effort on multiple fronts. Education is a critical part of this effort.

Religion can make it harder to reach girls, but it is not always clear whether the issue is religion per se or cultural practices grounded in religious rhetoric. In Pakistan the proliferation of single-sex primary schools in response to religious priorities raised the costs of girls' schools, reduced their quality, and slowed the process of universal education. Ironically, the large increase in enrollment for girls between 1997 and 2002 occurred in coeducational private schools, suggesting some combination of rising unmet demand by the public sector, the declining effects of religion, or altered preferences of parents.

Islam should not be an impediment to girls' schooling. Two large countries where Islam is nearly universally practiced—Indonesia and Malaysia—have achieved gender equity at both the primary and secondary levels. In Malaysia girls are somewhat more likely than boys to be in secondary school. Religion has not impeded girls' educational progress in Bangladesh, where girls attend coeducational schools and are more likely to be enrolled than boys. Islam did not block progress in Tunisia, where girls' participation now exceeds that of boys in secondary education. In India religion appears to have had no effect on school attendance, after controlling for caste and other socioeconomic factors (UIS 2005).

There are, however, exceptions. In Nigeria, where girls are 12 percent less likely to attend school than boys, Hausa-speaking children from Muslim northern Nigeria are 23 percent less likely to attend schools than Igbo- or Yoruba-speaking children,

who are largely Christian. Thus, it can be inferred that Muslim girls are 35 percent less likely to attend school than Christian boys. As this analysis controls for other socioeconomic factors, it is possible that religion is playing a role in these differences, although other unmeasured cultural factors may be involved as well.

Caste status (which is associated with occupational status) is an important factor in Nepal, where it overwhelms all other factors in explaining children's school enrollment or years of completed schooling; its effect is only slightly mitigated by household characteristics. In India the UIS study found no effect for caste status on school attendance, but other research confirms the salience of caste (Hoff and Panday 2005) and children from scheduled castes are less likely to be enrolled in school than children from higher status castes (chapter 5 of this volume).

Poverty compounds the effects of isolation and ethnicity in lowering school participation. In three-quarters of the 68 countries studied by the UIS (2005), children in households from the lowest income quintile were less likely to attend school than children from middle or higher income quintiles, with children in middle income quintile households more than twice as likely to attend school as children in the lowest income households. Combining poverty with ethnicity and gender often greatly reduces the likelihood of girls going to school. In Nigeria, the UIS study suggests that Hausa-speaking girls in the lowest income quintile are half as likely to attend schools as Yoruba-speaking boys in the highest income quintile. When controlling for other household characteristics, poverty has a larger effect on school attainment than ethnicity or gender. Still, poor minority families are often more likely to invest in the education of sons than daughters.

In Guatemala poor Mayan females have the lowest school participation and are least likely to remain in school. By age 16 only 4 percent of extremely poor indigenous girls attend school, compared with 20 percent of poor indigenous girls and 45 percent of nonpoor indigenous girls. Indeed, poverty is the most persistent and significant reason why children do not enroll in or complete primary or secondary school. In one multivariate analysis, an interaction term for indigenous females and poverty is significantly correlated with female school attendance, suggesting that the gender-poverty effects are greater than the sum of the two characteristics considered independently (chapter 6 of this volume). Speaking Spanish raised the probability of indigenous boys enrolling in school, but it was not a factor in raising enrollment of girls from two out of five indigenous groups (Edwards and Winkler 2004).

In rural Pakistan household wealth is strongly associated with the probability of ever having enrolled in school, for both boys and girls. In addition, children from the least developed communities are far less likely than children from more developed communities to have enrolled in primary school, and the effect of community development is stronger in the case of girls' school participation. In part, this is because higher income communities (mid-high and high categories) are more likely to have schools (public single-sex schools as well as private coeducational schools). But the

community and household wealth effects are strong even when controlling for the presence of a school.

In Lao PDR household income has a strong impact on the probability of minority girls going to school. The greatest gender disparities in enrollments exist among the Chine-Tibetan, who face the highest rates of poverty in the country. Among non–Lao-Tai minorities, 30–45 percent of parents of boys and 45–53 percent of parents of girls cite poverty and the costs associated with school as reasons for not sending their children to school.

Since families often cite cost as the most important factor in determining whether they send their children to school, many programs have sought to offset the direct costs of schooling to families. Girls have often benefited, at least initially. Under the Mexico *Progresa/Oportunidad* program, girls benefited more than boys from the conditional cash transfers in the first year, when the program attracted female dropouts back to school.[3] However, indigenous males living in communities without a secondary school disproportionately gained from the expansion in secondary education, with an enrollment increase of 23 percent. In a similar conditional cash transfer program in Ecuador, enrollment among program participants was 3.7 percentage points higher than among nonparticipants, and dropouts declined. The program did not have a differential effect on girls or minority students, however (Schady and Araujo 2006).[4]

Girls suffer more than boys from economic shocks to households. In rural Pakistan unanticipated economic shocks, such as crop losses, reduce the likelihood that girls but not boys are in school. In rural Uganda negative income shocks (as proxied by rainfall variations) are associated with sharp declines in girls' school enrollment and girls' performance on the primary school-leaving examination; the impact on boys is much smaller and only marginally significant (Bjorkman 2006).

Education of parents or household head should affect enrollment—and it does in most circumstances. In 93 percent of the countries analyzed by the UIS, maternal education was a significant correlate of whether a child attended school. Children of mothers who had ever attended formal schooling were much more likely to attend school than children of mothers who had not been to school. In Guatemala both mothers' and fathers' educational attainment has a sizable and significant impact on enrollment, especially if they completed primary school (chapter 6 this volume). Education of the head of household has a larger and more significant effect on

3 *Progresa* allows families to enroll separately in the different components of the program. The uptake for those eligible for cash transfers under the propensity scoring criteria was 95 percent, but the uptake for the education transfer was only 76 percent. Families could enroll in the income transfer program and enroll all, some, or none of their children under the education component. Not enrolling in the education transfer program cost families roughly $200 per child per year in foregone income.

4 The fact that indigenous groups make up only 6 percent of the Ecuadorian population led to a small sample of indigenous families, which may have contributed to the limited impact measured by the program.

enrollment in urban than rural areas in Lao PDR; mother's education has a significant impact only in rural areas. In rural Pakistan whether a mother ever attended school dramatically and significantly increases the probability that her daughter is enrolled but has no effect on sons. Fathers with lower-status occupations (agriculture or blue collar) are less likely to have daughters enrolled in school, controlling for school availability.

Even in rural China, where school participation at the primary level is near universal, mothers' educational attainment is associated with higher enrollment by their children. Mother's education helps predict secondary school enrollment, but mother and teacher expectations are equally important. In contrast, in Nepal the educational attainment of the household head has no effect on gender equity in enrollment, although children of mothers with some formal education are 2.5 times more likely to attend school than children of mothers lacking formal education

Demographic factors also affect enrollment. In Lao PDR the larger the number of children under six, as well as the more men relative to women in the household, the less likely any child goes to school, and the effect is greater for girls. Age is associated with completion in Guatemala for indigenous boys but not for indigenous girls, who are more likely to drop out early (Hallman, personal communication). More than 50 percent of children and 75 percent of indigenous boys and girls are over-age for their grade, reflecting a combination of late entry, repetition, and dropout/re-entry. In Guatemala family size and a recent birth in the family decrease the probability of attending school for girls but not boys (Edwards and Winkler 2004). In India and Nigeria children from families with more children under the age of five are significantly less likely to attend school than children with fewer young siblings (UIS 2005).

Aspirations and school performance have a bearing on whether girls stay in school and continue beyond primary school. In China mothers' education level, mothers' aspirations, and teacher expectations are the best predictors of secondary school enrollment. Being male and scoring better in math are only marginally significant factors. Among children in school, their aspirations for school attainment are most influenced by their math performance and their mothers' education, with wealth and gender largely insignificant. Male teachers have a small marginally significant effect on student aspirations, and the interaction of males and male teachers has a strong positive effect. Aspirations of mothers and expectations of teachers largely substitute for mother's education in explaining children's expectations for themselves. In the Indian states of Rajasthan and Orissa parental expectations and previous performance in math are significantly associated with achievement when controlling for student, classroom, and school effects. Once family background is controlled for, coming from a scheduled caste or tribe does not directly affect student's academic achievement. Only the highest performers even take the test so selection effects also play a role in these results, but it suggests that girls are actually in functional schools and are being taught roughly on par with boys.

In Bangladesh a combination of factors, including aspirations, were at work in the stunning rise in girls' schooling. Nongovernmental organizations played a signature role in making schools accessible to girls and boys in rural areas; expansion of government schools at the primary and secondary levels contributed, as did shifts in economic opportunities for girls in garment factories and elsewhere, which signaled positive returns to female education. Public policy also played a major role in raising aspirations of parents for their daughters through the secondary school stipend program as well as related efforts to encourage girls to enroll and continue in school and to delay marriage. Anthropological work has indicated how girls' education has become an objective for Bangladeshi parents who two decades ago saw no point in sending their daughters to school. The lack of tribal and linguistic differences, however, may well be important in the government's successful efforts to encourage girls' schooling. This does not diminish the value of those efforts. It suggests, however, that it may be more feasible for a committed government to make progress in a homogeneous setting.

In sum, the results show considerable divergence across and within countries. What determines enrollment often varies across subgroups. Poverty and isolation play a role, as do parental characteristics, but the importance of ethnicity and community characteristics of indigenous groups persists across all countries. In Nepal socioeconomic factors and location have no impact, as caste overwhelmingly determines girls' enrollment. This suggests the difficulty of reaching certain populations and the need to experiment with alternative ways to engage and include girls who are outside the mainstream. The evidence base is thin, as are the data with which to analyze exclusion, particularly exclusion of marginalized girls. More and better data, broader experimentation to engage hard to reach groups, and more in-depth research will be required to develop an adequate evidence base that can guide policy.

Cross-country evidence on girls' education and exclusion

Heterogeneity within a country—on the basis of gender, ethnicity, residence, wealth, and well-being—contributes to variations in school participation and performance. Can heterogeneity also explain cross-country variations in education?

Heterogeneity is defined as "ethnolinguistic fractionalization," an index taken from Alesina and others (2003), based on the work of ethnologists and anthropologists, that captures the degree of racial and linguistic heterogeneity in 190 countries. It allows cross-country comparisons of fractionalization of ethnicity and language.

We focus on three main schooling variables: the female primary completion rate, the difference between the male and female primary completion rates, and a learning score. The learning score measure is based on Crouch and Fasih's (2004) "imputed learning scores" for countries, based on actual performance on a range of

Table 1.2. Descriptive statistics and their sources, circa 2000

Variable	Mean	Standard deviation	N	Source
Female primary completion rate	78.91	26.43	129	World Bank (2005a)
Difference in the male and female primary completion rate (percentage of relevant age group)	3.67	8.73	129	World Bank (2005a)
Learning score	383.43	96.49	56	Crouch and Fasih (2004)
GDP per capita (log)	8.10	0.90	130	World Bank (2005a)
Ethnolinguistic fractionalization	0.46	0.25	136	Alesina and others (2003)
Ethnolinguistic fractionalization squared	0.27	0.24	136	Alesina and others (2003)
Average years of schooling, female (age 25+)	2.98	1.62	73	Barro and Lee (2000)
Education expenditure (percentage of GDP)	4.44	2.21	124	World Bank (2005a)
Female labor force participation rate	37.34	10.28	133	World Bank (2005a)
Socialist dummy	0.22	0.42	150	Authors
Road density (total network/land area)	38.74	57.22	145	World Bank (2005a)
Rural population (percentage of total population)	51.62	20.43	146	World Bank (2005a)

international tests and equated to a common measure: the Trends in International Mathematics and Science Study (TIMSS) in the mid-1990s.[5] The analyses also control for selected economic and development indicators. The small number of countries reporting data for average years of female schooling (73) and learning scores (55) combined with the uneven country coverage of other variables produces substantial differences in the number of observations for each model (table 1.2). The strong correlation among factors also poses difficulties. Correlations between the primary completion

5 The TIMSS is sponsored by the International Association for the Evaluation of Educational Achievement (IEA), a nongovernmental organization that has sponsored cross-national assessments of achievement on a four-year cycle, typically for students who have completed four to eight years of school. The most recent assessment, in 2003, involved 46 education systems, including 26 from low- and middle-income countries.

Table 1.3. Elasticities of primary completion and learning and ethnolinguistic fractionalization

Independent variable	log (Female PCR)	log (Male PCR) – log (Female PCR)	log (Learning score)
Ethnolinguistic fractionalization, log	–0.22*** (–4.27)	0.09*** (3.99)	–0.17*** (–3.65)
Constant	4.06*** (62.80)	0.17*** (6.46)	5.74*** (101)
Number of observations	118	118	55
R^2	0.14	0.12	0.20

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics.

Source: Alesina and others (2004); Crouch and Fasih (2004); World Bank (2005a).

rate and GDP per capita (0.73) and average years of schooling (0.74) are particularly troublesome. We attempt to address the problem with instrumental variables; we report different models to try to ferret out the effects of the correlated variables.

All three estimates of the elasticities (percent change) for completion measures and learning due to differences in ethnolinguistic fractionalization are highly significant, with the largest for female primary completion (table 1.3).[6] The greater the within-country heterogeneity, the lower the female primary completion rate for the country, with a 1 percent increase in ethnolinguistic fractionalization leading to a .22 percent decrease in female primary completion, suggesting the importance of a homogeneous society in fostering girls' education. Although the importance of ethnolinguistic fractionalization on male-female disparities in primary school completion is somewhat lower, a 1 percent increase in the degree of fractionalization leads to a .09 percent increase in male primary completion rate advantage. Heterogeneous societies also slow learning, as measured by performance on international tests. For every 1 percent increase in ethnolinguistic fractionalization, learning scores are .17 percent lower, indicating that here too the composition of the society influences learning performance. Thus countries with multiple ethnic and language groups are likely to have lower primary completion rates for girls, a widening gap between male and female completion rates, and lower overall achievement.

Given that countries also vary in other measures of development that could affect school participation and learning, we next move to multivariate models. We

6 The dependent variable on the difference in primary school completion is calculated as log(male/female) to avoid the loss of observations where the male-female difference is less than or equal to zero.

Table 1.4. Determinants of female primary school completion (percentage of relevant age group)

Independent variable	Model 1	Model 2	Model 3
Ethnolinguistic fractionalization	–42.10*** (3.93)	–16.59* (1.83)	–35.95*** (3.70)
Average years of schooling, female (age 25+)		8.38*** (4.66)	
Education expenditure (percentage of GDP)	0.83 (0.77)	–1.18 (1.23)	0.97 (0.98)
Female labor force participation rate	–0.37 (1.59)		
Socialist dummy		–14.19 (1.35)	14.66*** (4.30)
Road density (total network/land area)	0.08** (2.46)		
Rural population (percentage of total population)		–0.22 (1.67)	–0.45*** (3.87)
Constant	106.72*** (10.13)	80.08*** (8.30)	111.84*** (15.42)
Number of observations	94	53	100
R^2	0.27	0.65	0.44

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are t-statistics.

Source: See table 1.2.

provide results for three different models of the determinants of girls' primary completion rate (table 1.4; all results are not reported). Model 1 shows the importance of ethnic and language heterogeneity in decreasing the likelihood of girls completing primary school. The ethnolinguistic fractionalization coefficient value is large, negative, and significant. The sign of the coefficient for road density (a measure of the ease of reaching rural and remote populations) is positive and significant, but the effect is small. The adjusted R^2 of 0.26 is modest, suggesting that these three variables explain only part of the variation in girls' primary completion rate. Ethnolinguistic fractionalization retains the expected sign and coefficient size in other estimations;

road density (not shown) keeps its sign, but its significance is highly sensitive to the model selected.

In model 2 the average years of female schooling for women over 25 has a strong, positive effect on the female primary completion rate, but its inclusion reduces the coefficient size and level of significance for ethnolinguistic fractionalization and removes the significance of rural populations and the socialist dummy. However, model 2 uses data from only 53 countries, compared with the 94 countries of model 1. Together with the high correlation between average years of schooling and the female primary completion rate (0.74), this suggests the need for caution in interpreting the results. Indeed, comparisons between the two models may not be justified.

Model 3 tests the relevance of education expenditures and rural location on the female primary completion rate. The percentage of the population that is rural is not significant for the smaller (with average years of schooling) sample but becomes significant with the expected sign for the larger sample with less biased estimates. The socialist dummy produces significant and positive coefficients, reflecting the considerable emphasis placed on education for all children in the former Soviet Union and Eastern Europe. Ethnolinguistic fractionalization remains negative and highly significant, suggesting the robustness of the factor.

These results bolster the hypothesis that ethnic heterogeneity slows progress in education for girls. It is important in explaining both the lagging performance of girls and their lower relative completion of primary school, consistent with the simpler results presented in figures 1.1 and 1.2.

We tested the determinants of the disparity between completion rates of boys and girls using four different models (table 1.5). The findings show a strong effect of GDP per capita, average years of schooling, and particularly ethnolinguistic fractionalization; the ethnolinguistic fractionalization and ethnolinguistic fractionalization squared combination is significant, a configuration that was consistently unimportant in the female primary completion rate regressions.[7] Model 2 suggests that the effect of ethnolinguistic fractionalization is exponential, since higher levels of heterogeneity show stronger positive effects on gender disparity in completion. Model 3 has more overall explanatory power, as indicated by an R^2 of 0.60, despite its smaller sample size (due to average years of schooling). It includes a socialist dummy and a marginally significant coefficient for location. Models 2, 3, and 4 include an insignificant education expenditure variable, a finding emerging in virtually every regression. Model 1 shows location to be insignificant, but inserting location in the model produces mixed results (other model formulations not shown), possibly because it captures the average rural population rather than pockets or remote areas in countries, which are associated with low educational attainment.

7 Unlike the high correlation between the female primary school completion rate and both GDP per capita and average years of schooling, the gender disparity in the primary school completion rate variable is not highly correlated with either of them.

Table 1.5. Determinants of gender disparity in primary school completion

	Difference between male and female primary completion rates			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
GDP per capita (log)	–2.93*** (2.88)	–3.18*** (3.46)		
Ethnolinguistic fractionalization	10.61*** (3.01)	–18.32* (1.77)	16.43*** (3.52)	17.88*** (4.42)
Ethnolinguistic fractionalization squared		31.69*** (2.72)		
Average years of schooling, female (age 25+)			–2.93*** (4.49)	
Education expenditure (percentage of GDP)		–0.32 (0.92)	0.13 (0.24)	–0.44 (1.39)
Female labor force participation rate				0.10 (1.41)
Socialist dummy			11.59*** (4.86)	
Road density (total network/ land area)			0.02* (1.89)	0.00 (0.45)
Rural population (percentage of total population)	0.04 (1.15)			
Constant	20.77** (2.06)	30.52*** (3.60)	2.75 (0.77)	–7.04** (2.44)
Number of observations	111	97	53	94
R^2	0.39	0.46	0.60	0.30

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics.

Source: See table 1.2.

Heterogeneity would also be expected to affect learning outcomes, through mechanisms operating between schools (to reduce school inputs) and within schools (to discriminate against "minority" children). The other variables explaining school

Table 1.6. Determinants of learning

	Learning score			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Ethnolinguistic fractionalization	−129.90*** (−3.64)	−35.42 (−0.61)	−109.20*** (−2.92)	−45.60 (−0.87)
Female primary completion rate (instrumented)		2.36** (2.65)		1.96** (2.33)
Socialist in 1990	104.60*** (5.51)	103.90*** (4.77)		
Female labor force participation rate			4.72*** (5.38)	4.51*** (5.56)
Road density (total network/ land area)	0.26 (1.52)	−0.01 (−0.06)		
Rural population (percentage of total population)			−3.06*** (−5.79)	−2.30*** (−3.49)
Constant	409.80*** (20)	177.20* (1.88)	399*** (10.5)	178.20* (1.73)
Number of observations	55	46	54	46
R^2	0.52	0.62	0.62	0.67

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics.

Source: See table 1.2.

completion would also be expected to influence learning. However, for estimating correlates of achievement at the country level, it is important to take into account differences across countries in the share of children in school. In countries in which not all children attend school, those who continue in school are likely to be both more advantaged and better performers. To control for these variations, we add to the learning regressions the primary completion rate for girls. However, since the female primary completion rate is highly correlated with the learning variable, we use an instrumented variable, the primary completion rate of females as predicted by two variables: the log GDP per capita, and educational expenditure as a percentage of GDP. In all four regressions the effects of ethnolinguistic fractionalization are in the expected negative direction (table 1.6). In models 1 and 3, they are large and highly significant. In

models 2 and 4, the female primary completion rate (instrumented) is positive and significant, even when controls for socialist history and female labor force participation are included. This effect suggests that education systems with greater participation of girls are also more effective in teaching all children.

Models 1 and 2 include an indicator for socialist history, which is strongly and significantly related to learning achievement at the national level, whether or not the instrumental variable is included. This indicator captures past investment in schooling in many Eastern European countries. Models 3 and 4 demonstrate the positive effect of female labor force participation on learning, possibly also an effect of past socialist history. The effect of female labor force participation on learning also suggests that the more women leave the household and are employed, the greater the potential returns to their education and hence the greater the motivation for girls' learning. The negative effect of having a large share of the population living in rural communities is expected, given the more limited access to and lower quality of available schooling outside of urban areas.

The cross-country analysis suggests the importance of income, ethnicity, location, women's labor force participation, and a history of educating women in explaining both primary school completion for girls and the observed disparity in primary school completion between girls and boys. All these factors except ethnicity also explain learning. These findings bolster much of the country-level evidence produced in the case studies and provide a sense of aggregate performance across developing countries.

Policy implications and areas for further research

What policy levers are needed to reach excluded girls and bring them into school? A range of critical policy options is needed. While there are some hints regarding possible action, better understanding is needed on how to reach, engage, and support excluded girls in obtaining an education.

Improving school quality and upgrading underperforming schools

School quality is an important element in attracting and retaining children from excluded groups in school. It is particularly important for girls because parents are more reluctant to send their daughters to school. Upgrading schools, integrating programs that involve the community, and ensuring basic standards will be critical to bringing the remaining children into school. Functioning infrastructure, availability of books, trained teachers who show up for class, and tolerance toward minorities and girls represent some key elements that require attention.

Programs focused on underperforming schools have been shown to have spillover effects on underserved populations, as in Chile (McEwan 2006). By focusing

directly on underperforming schools and providing support to these schools to create local solutions for underperformance, such programs can reach the excluded groups that suffer from poor school quality without seeming to discriminate on the basis of race, ethnicity, or other exclusionary characteristic.

Providing bilingual education

One of the proven means for bringing linguistically excluded children into school is by initially teaching them in their mother tongue before phasing in the national language; bilingual teachers and high-quality instructional materials and books in both languages are essential. A major factor behind progress in educational attainment of language minority groups in Canada (First Peoples) and New Zealand (Maori), early bilingual programs have worked in developing country settings as well, although they are often unavailable (Lewis and Lockheed 2006). Only a third of rural children in Guatemala have access to bilingual schools. In Morocco Berber-language instruction has been introduced only recently in a set of pilot schools. Language has been a major impediment to school enrollment among Roma in Eastern Europe who do not speak the national language (Ringold, Orenstein, and Wilkens 2003), among minority groups in Lao PDR, and in certain communities in Latin America (Hall and Patrinos 2006).

Involving the community

Involving the community and meeting specific concerns of parents—the opportunity cost of lost labor, unaffordable schooling costs, unease at allowing girls to walk to or even attend school because of safety reasons—are critical. Supporting outreach programs to community leaders and parents; bringing parents into classrooms; providing scholarships, in-kind supplies, and school meals for students; and in some cases paying households through conditional cash transfers that compensate parents for allowing children to attend school can help break the chain of illiteracy among women.

Offering special programs for excluded groups

Compensatory investments that bring excluded children up to the same level as the mainstream population (through preschool programs, after-school and summer programs, or special assignments, for example) can be effective. Scholarships to encourage enrollment for girls, tutoring, and prizes for good performance are possible approaches. Affirmative action on a limited scale and for a limited period may be useful, but the approach can often backfire if it is too generous or creates too much disadvantage for the majority population.

Conducting more focused research on excluded groups

The evidence base on excluded groups and schooling is uneven. Why are some girls from excluded communities in school and others out of school? Are there circumstances that make schooling more or less attractive?

Research and evaluations of different interventions are a priority. We know very little about successful interventions that attract excluded girls into primary school or keep them there through secondary school. Because the focus has traditionally been on generic problems, existing knowledge can be useful, but it is unlikely to be enough in fashioning policies that meet the needs and concerns of parents and children from excluded communities. Indeed, there is some evidence that traditional incentives are insufficient for many groups and extra efforts are needed. Where demand for education is low, poor-quality schools can accelerate dropout among the excluded. Experience in New Zealand and the United States with excluded groups reflects this, as does experience with the Roma in Eastern Europe and some immigrant groups in Europe (Lewis and Lockheed 2006).

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Part I

Ethnic and linguistic diversity and lower school enrollment

2

Girls in Lao PDR: Ethnic affiliation, poverty, and location

Elizabeth M. King and Dominique van de Walle

Schooling is one of the best hopes for improving the lifetime prospects of a child—even a child from a poor family. The benefits—physical, economic, and social—cascade across generations, increasing socioeconomic mobility and reducing poverty. Unfortunately, the poorest children and those who live in remote rural areas are often the hardest and costliest to reach.

This chapter examines educational progress in the Lao People's Democratic Republic and the factors that explain current enrollment and attainment. It examines how familiar variables such as household income and access to schools affect school attendance and school outcomes and how these effects vary by gender, geographical location, and ethnolinguistic affiliation (box 2.1). The evidence presented shows that these divisions are indeed important in determining whether a child has access to schools (especially to good schools) and what level of education the child can attain.

The analysis draws primarily on data from the Lao Expenditure Consumption Survey for 2002/03 (LECS3), as well as on a school survey that was fielded in conjunction

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with the LECS3 using the same sampling frame. The LECS3 is a nationally representative household survey that covered 8,100 households (National Statistical Centre, Government of Lao PDR, 2004). Most of our analysis is based on 2002/03 data, but where possible we also make comparisons over time using the LECS2, which was fielded in 1997/98 and covered 8,882 households (Bäckström and Säfström 1997). The linked school survey collected detailed information on facilities, personnel, and other characteristics for each primary school available to children of primary school age surveyed in the LECS3.

The chapter is organized as follows. The first section overviews long-run trends in educational achievement and literacy, focusing on the effects of gender, location, ethnolinguistic group, and economic welfare. Section 2 examines current enrollment rates of school-age children, their continuation rates from one level to another, and the age profile of students. Section 3 estimates the importance of the factors identified in previous studies as important to schooling. It presents a basic conceptual model that focuses on individual, household, school, and village characteristics before introducing an expanded model that also includes measures of the supply and quality of schools. The last section summarizes the conclusions and draws some policy implications.

Educational attainment and adult literacy: Uneven progress over time

Educational attainment (the number of years of schooling completed) increased in Lao PDR during the past four decades, rising from two years of schooling for those born in the mid-1940s to more than five years for those born in the mid-1980s. But progress has been uneven.

Because long time-series data are not available, we use differences in the average number of completed years of schooling of adults of different ages to derive historical changes in education levels.[1] To reduce the effect of higher mortality rates among older people, we examine only people 60 and younger. We compare urban and rural populations, as well as males and females. We also subdivide the geographical and gender groups into two ethnolinguistic groups, Lao-Tai and non–Lao-Tai. Two-thirds of the population is Lao-Tai. The rest of the population is Mon-Khmer (21 percent), Hmong-Lu Mien (8 percent), Chine-Tibetan (3 percent), and other smaller groups (1 percent). Dividing the population into just two groups is done for convenience; together the two groups include 50 distinct ethnicities. Minority ethnic groups are found predominantly in rural areas. Because of small sample size, they are not included in the urban category.

1 The average number of years of schooling attained is defined as the highest grade completed rather than the actual number of years enrolled in school. Due to grade repetition, the highest grade attained can imply fewer years of schooling than the number of years actually spent in school.

Box 2.1. Ethnolinguistic diversity in Lao PDR

Lao PDR is one of the poorest countries in Southeast Asia, with per capita gross national income (GNI) of just $390 in 2004 ($1,850 using purchasing power parity adjusted per capita GNI). Its GNI is just 15 percent (23 percent in PPP adjusted terms) of Thailand's and 70 percent (69 percent) of Vietnam's (World Bank 2005).

The country is ethnically diverse, especially in the north, where at least three ethnolinguistic families are represented in every district. These ethnic groups speak distinct languages, presenting the education system with a difficult challenge. The Lao-Tai family, the largest of the groups, comprises the Northern, Central, and Southwestern branches, each of which has a different language, although most of the language groups belong to the Southwestern branch. Most of the Southwestern Tai languages (Lao, Lue, Tai Dam) have their own writing systems, but only the Lao language system has been developed and officially approved as the national language. In the Mon-Khmer ethnolinguistic family, two Khmou groups and the Katu have elaborated Laoicized alphabets and dictionaries that have not yet been approved by the government. In the Chine-Tibetan family, most languages are in the Lolo-Burmese branch of Tibeto-Burmese. About 50 years ago, missionaries developed romanized scripts for two groups in this family. The Hmong-Mien family is represented by five languages. Of these, Moun and Mien use Chinese characters, while White Hmong uses a romanized writing system. There are Hmong alphabets using Lao characters for both White and Green Hmong, but they are not well developed (World Bank 2004).

In parts of the country populated by minority groups, the availability of teachers and textbooks in the local languages is a problem. Ethnic groups that have no tradition of literacy and do not speak Lao face a major disadvantage.

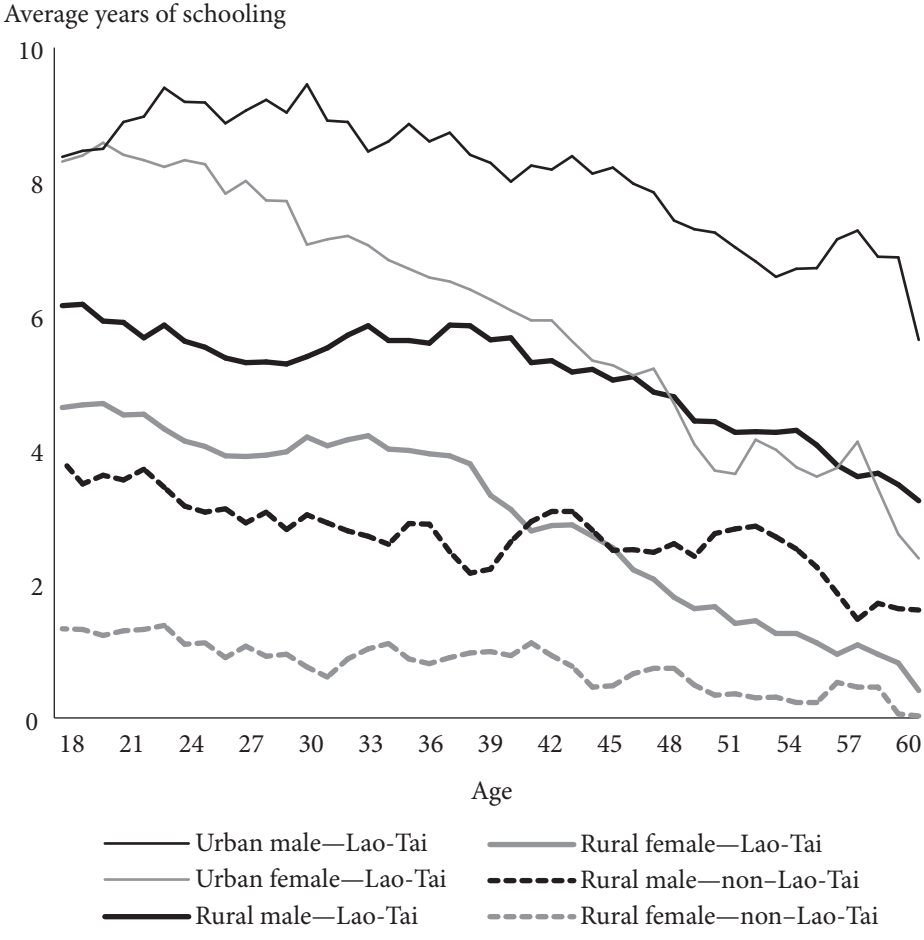
Gains in schooling levels

The educational cycle in Lao PDR starts with five years of primary school, followed by three years of lower secondary school and three years of upper secondary school. Some students go directly from primary or lower secondary school to teacher or vocational training, which may take an additional year or two. Others move on to the upper secondary level and eventually to university. Ideally, a student who completes all levels of education enters primary school at age six and finishes university at 22.

There has been a steady increase in educational attainment in Lao PDR over the past 40 years, as well as important relative changes across population groups (figure 2.1). In both urban and rural areas Lao-Tai females achieved the largest gains. In urban areas the average schooling years for male and female Lao-Tais were equal, although this was partly achieved by a decrease of one year in the average years of schooling of the youngest men. In rural areas the gender gap narrowed to just over one year, and Lao-Tai females even overtook non–Lao-Tai males some 20 years ago. In contrast, there is no sign of any gender convergence among non–Lao-Tai groups, and the gap between rural Lao-Tai and non–Lao-Tai females and between rural and urban females is widening.

For cohorts born between 1943 and 1985 the average number of completed years of schooling started from a low base of two years and increased to 5.5 years—an annual increase of 0.08 school years, or one school year every 12.5 years. Educational attainment

Figure 2.1. Average years of schooling in Lao PDR, by age, gender, and ethnolinguistic group, 2002/03



Note: Figures represent three-age moving averages. Data for urban non-Lao-Tai are not plotted because of small sample size.

Source: LECS3, 2002/03.

is higher for urban populations, but rural populations have gained, indicating a convergence (attainment has doubled for urban populations but tripled for rural populations). Gains, however, were smallest among rural non–Lao-Tai females (just 0.04 school years per year). Even within the youngest cohort, non–Lao-Tai females had 6.6 fewer years of schooling than urban Lao-Tai males, the group with the highest schooling.

Geographic inequalities go beyond urban-rural differences: significant variation exists also across provinces and districts—even elevations. People living in the highlands have the lowest living standards and the worst schooling outcomes. This is one reason why the government adopted a policy of "focal sites" in the late 1980s. Under this policy, residents of highland villages are resettled in lowland focal areas, where basic public services already exist or could be provided more efficiently (Evrard and Goudineau 2004). In 2003 the government introduced a program that focuses on 47 of 143 priority districts. Within this group a further delineation is made between first and second priority districts.

For the most part, changes in average years of schooling over the period spanned by the 1997/98 and 2002/03 LECS reflect growth in consumption.[2] One striking exception is for urban females, among whom schooling increased at given levels of household economic welfare, particularly among the poor. This divergence from the consumption trend is also evident among poor urban males and better-off rural females. It suggests a supply effect (for example, due to greater availability of public schools), an increased preference for schooling (for example, due to perceived higher returns to education), or both.

Improvements in literacy

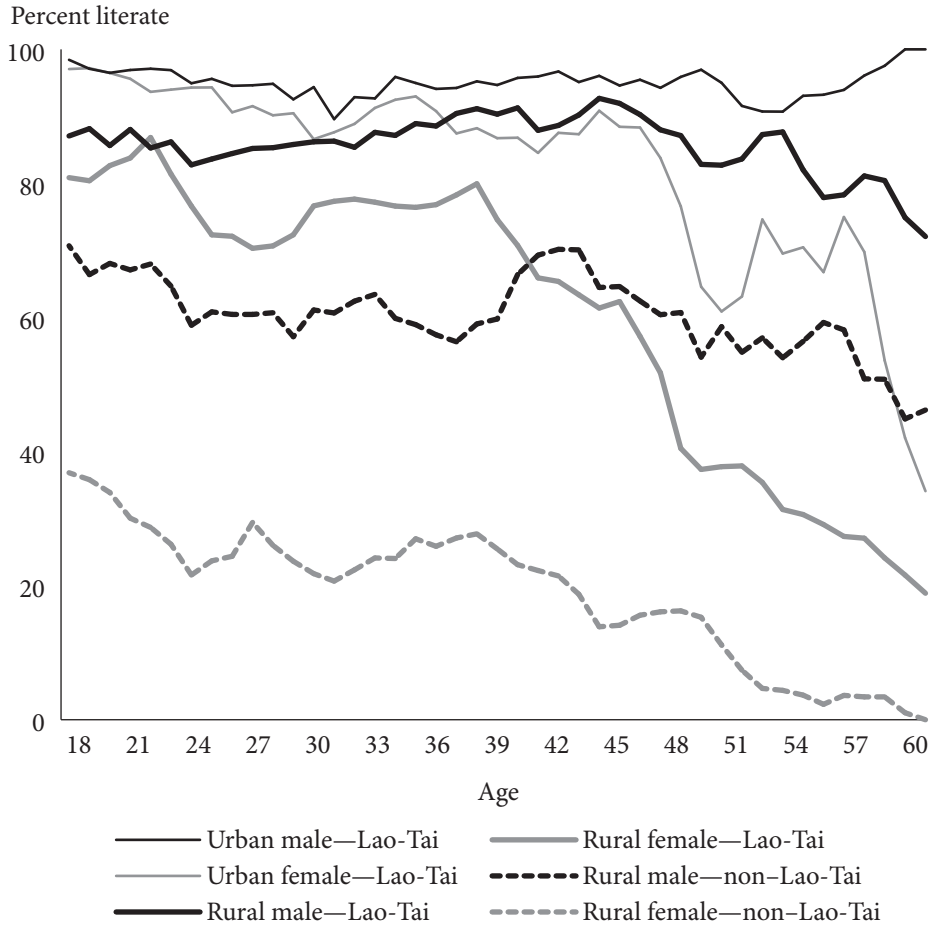
The increase in years of schooling has translated into higher literacy (the ability to read and write).[3] Plotting the literacy rate against age yields historical patterns and trends similar to those for years of schooling (figure 2.2). Urban Lao-Tai males have the highest literacy (more than 90 percent for all cohorts). The continuous increase in years of completed schooling for urban Lao-Tai females is reflected in a sharp increase in their literacy in the past 30 years. As a result of this increase, the literacy rates of male and female 18-year-old Lao-Tais have converged. In rural areas, Lao-Tai males have also achieved relatively high literacy, although lower than that of urban Lao-Tai females. Rural Lao-Tai females have surpassed rural non–Lao-Tai males. Rural non–Lao-Tai females, however, continue to have the lowest literacy, with only 30 percent of the youngest cohorts literate.[4]

2 King and van de Walle (2005) provide nonparametric regressions of the relationship between schooling and per capita consumption.

3 The 2002/03 LECS allows a finer definition than the earlier survey by giving an additional measure that excludes those who can read and write only with difficulty. Defining literacy more strictly as being able to read and write without difficulty results in a significant drop in literacy rates, especially among the poor (King and van de Walle 2005).

4 These figures are consistent with those of UNESCO, which defines literacy as being able to read, write, and understand a short simple statement about everyday life. According to their data, adult literacy (15 and over) increased from 48.2 percent in 1980 to 56.5 percent in 1990 and 64.8 percent in 2004. Among people ages 15–24, the literacy rate increased from 62.6 percent in 1980 to 70.1 percent in 1990 and 78.5 percent in 2004 (see the entry on Laos at the Global Virtual University's website, http://globalis.gvu.unu.edu/country.cfm?country=LA&indicatorid=0, copyrighted 2003-2007).

Figure 2.2. Literacy rates in Lao PDR, by age, gender, and ethnolinguistic group, 2002/03



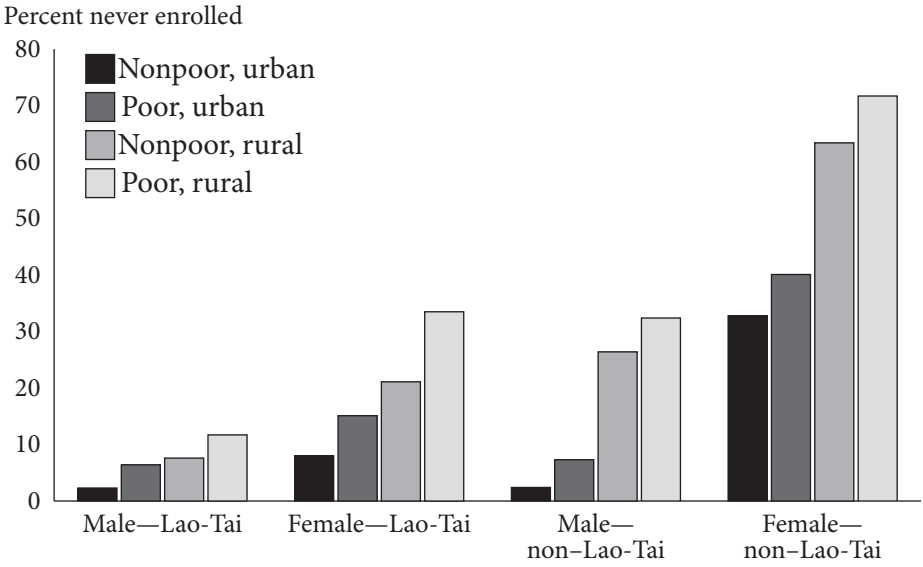
Note: Figures represent three-age moving averages. Data for the urban non–Lao-Tai are not plotted because of small sample size.

Source: LECS3, 2002/03.

Literacy has increased among the poor and nonpoor alike, and the gains have generally been both absolutely and proportionally larger for the poor. Nevertheless, literacy remains much lower among the poor, particularly among rural females.[5]

5 Poverty is defined using the cost of basic needs method whereby the poor are those with real consumption per person lower than the cost of a given food and non-food basket of goods. See Richter, van der Weide, and Souksavath (2005).

Figure 2.3. Percentage of Laotians 18–60 who never attended school, by gender, ethnolinguistic group, poverty status, and urban/rural location, 2002/03



Source: LECS2, 1997/98 and LECS3, 2002/03.

Among poor rural females, the literacy rate was 39 percent in 1997/98 and 46 percent in 2002/03. In contrast, among nonpoor rural females, 58 percent were literate in 1997/98 and 67 percent in 2002/03.

Has progress simply been the result of recent economic growth and increases in income? The evidence suggests not: there has been a shift in the relationship between literacy and household per capita consumption between 1997/98 and 2002/03 for various population groups. At every level of real per capita consumption, literacy is higher in 2002/03 than in 1997/98. As with schooling levels, this gain may reflect any of several factors, including increased availability of public schools, greater preference for schooling among the poor, higher perceived returns to education, other policy initiatives (such as a literacy campaign), or some combination of these factors.

The upward shift in the relationship between literacy and household consumption is consistent with a relative gain in schooling for the poor. For the national and rural distributions, absolute gains in literacy are nearly constant across the income distribution, meaning that they are proportionately larger for the poor. However, some significant differences in absolute gains are apparent in urban areas, where absolute gains have been largest for the poorest. The increase appears to have been driven by the enormous progress among poor urban females, who had lagged behind other

urban groups. Poor males also achieved some progress, albeit less than females. As a result of these changes, literacy is becoming less skewed by income in urban areas. The same trend is not apparent in rural areas.

School attendance patterns mirror these trends (figure 2.3).[6] The percentage of people who never attended school is much higher in rural areas than in urban areas. Within both areas, the proportion of the population that never attended school is much smaller among Lao-Tai than other groups. Among both Lao-Tai and non–Lao-Tai, males are more likely to have attended than females, and the nonpoor are more likely to have attended than the poor. Particularly striking is the pronounced disadvantage of both poor and nonpoor non–Lao-Tai females, especially in rural areas.

Educational inequality among children now in school

This section examines children currently in school. It describes school enrollment patterns of different groups of children, including age at entry and school continuation rates.

Enrollment in primary and secondary school

Among children in the official primary school-age group (ages 6–12), the gross enrollment rate was 79.8 percent and the net enrollment rate 69.2 percent in 2002/03, according to the LECS. Using UNESCO data for several Asian countries, Lao PDR ranks not too far behind Cambodia or Thailand: in 2001 the gross primary enrollment rate was 86.2 percent in Cambodia, 86.3 percent in Thailand, and 82.8 percent in Lao PDR.[7]

But averages mask enormous variance (table 2.1). Urban children are more likely to be in school than rural children, Lao-Tai children are more likely to be in school than non–Lao-Tai children, boys are more likely to be in school than girls, and nonpoor children are more likely to be in school than poor children. The one exception to this pattern is urban girls, who have slightly higher enrollment than urban boys. Age-specific participation rates for children ages 6–12, independent of poverty status, range from 52 percent for rural non–Lao-Tai girls to 92 percent for urban Lao-Tai girls—a striking difference. Differences between these two groups in gross enrollment rates (63 versus 87 percent) and net enrollment rates (51 versus 79 percent) are also huge. Taking poverty into account, age-specific participation rates range from 46 percent for poor non–Lao-Tai girls in rural areas to 93 percent for nonpoor Lao-Tai boys and girls in urban areas—another huge difference.

6 Throughout this chapter, quintiles are of the national population ranked by household per capita consumption in 2002/03.

7 There may be some discrepancy between the UNESCO enrollment data for Lao PDR and the LECS3 data.

Table 2.1. Primary school enrollment in Lao PDR, by gender, urban/rural location, ethnolinguistic group, and poverty status, 2002/03 (percent)

	Urban				Rural						Total
	Lao-Tai		Total		Lao-Tai		non–Lao-Tai		Total		
Variable	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Total											
Age-specific participation (6–12)	90.4	91.9	89.4	90.8	82.1	80.7	60.1	52.0	73.1	68.7	74.6
Net enrollment rate	78.4	78.7	78.6	78.1	76.8	74.4	58.6	51.0	69.4	64.7	69.2
Gross enrollment rate	89.1	86.5	90.5	86.6	91.2	84.3	78.3	63.2	86.0	75.5	79.8
Number of observations	686	655	847	796	2,356	2,269	2,139	2,201	4,495	4,470	10,608
Nonpoor											
Age-specific participation (6–12)	92.7	93.4	91.8	92.5	86.8	85.6	65.8	59.5	80.1	77.2	81.8
Net enrollment rate	79.3	78.4	79.2	77.8	80.6	77.9	63.3	58.1	75.1	71.5	74.5
Gross enrollment rate	88.8	85.6	89.5	85.6	95.2	87.2	83.6	70.2	91.5	81.7	86.9
Number of observations	541	533	624	603	1,607	1,513	990	988	2,597	2,501	6,325
Poor											
Age-specific participation (6–12)	82.0	85.9	82.4	85.1	71.3	70.2	54.9	45.7	62.4	56.7	62.5
Net enrollment rate	75.1	79.7	76.9	79.0	68.2	67.1	54.5	45.0	60.8	55.0	60.3
Gross enrollment rate	90.3	90.3	93.4	90.1	82.3	78.2	73.6	57.4	77.6	66.7	74.5
Number of observations	145	122	223	193	749	756	1,149	1,213	1,898	1,969	4,283

Note: The denominator for the net and gross enrollment rates is the number of children 6–12. All estimates are population weighted.

Source: LECS3, 2002/03.

These numbers obscure further disparities across ethnicity groups. Some groups included in the non–Lao-Tai ethnolinguistic group fare much worse than others (table 2.2). Enrollment rates among rural 6- to 12-year-olds from the Chine-Tibetan ethnolinguistic group are considerably lower than rates among other groups, with just 39 percent of boys and 33 percent of girls enrolled in school. Rural girls in the non–Lao-Tai group have an age-specific enrollment rate of just 30 percent. Due to small sample

Table 2.2. Mean primary net school enrollment rates in Lao PDR for children 6–12, by ethnolinguistic group, gender, and urban/rural location, 2002/03 (percent)

	Urban		Rural	
Variable	**Male**	**Female**	**Male**	**Female**
Lao-Tai				
Enrollment rate	90.4	91.9	82.1	80.7
Number of observations	686	655	2,356	2,269
Mon-Khmer				
Enrollment rate	80.1	75.0	61.4	57.4
Number of observations	76	73	1,271	1,321
Hmong-lu Mien				
Enrollment rate	87.8	84.5	66.0	48.3
Number of observations	50	42	560	580
Chine-Tibetan				
Enrollment rate	86.5	100.0	38.7	32.7
Number of observations	32	23	260	248
Other				
Enrollment rate	—	—	47.3	30.0
Number of observations	3	3	48	53

Note: All estimates are population weighted. — indicates insufficient observations.

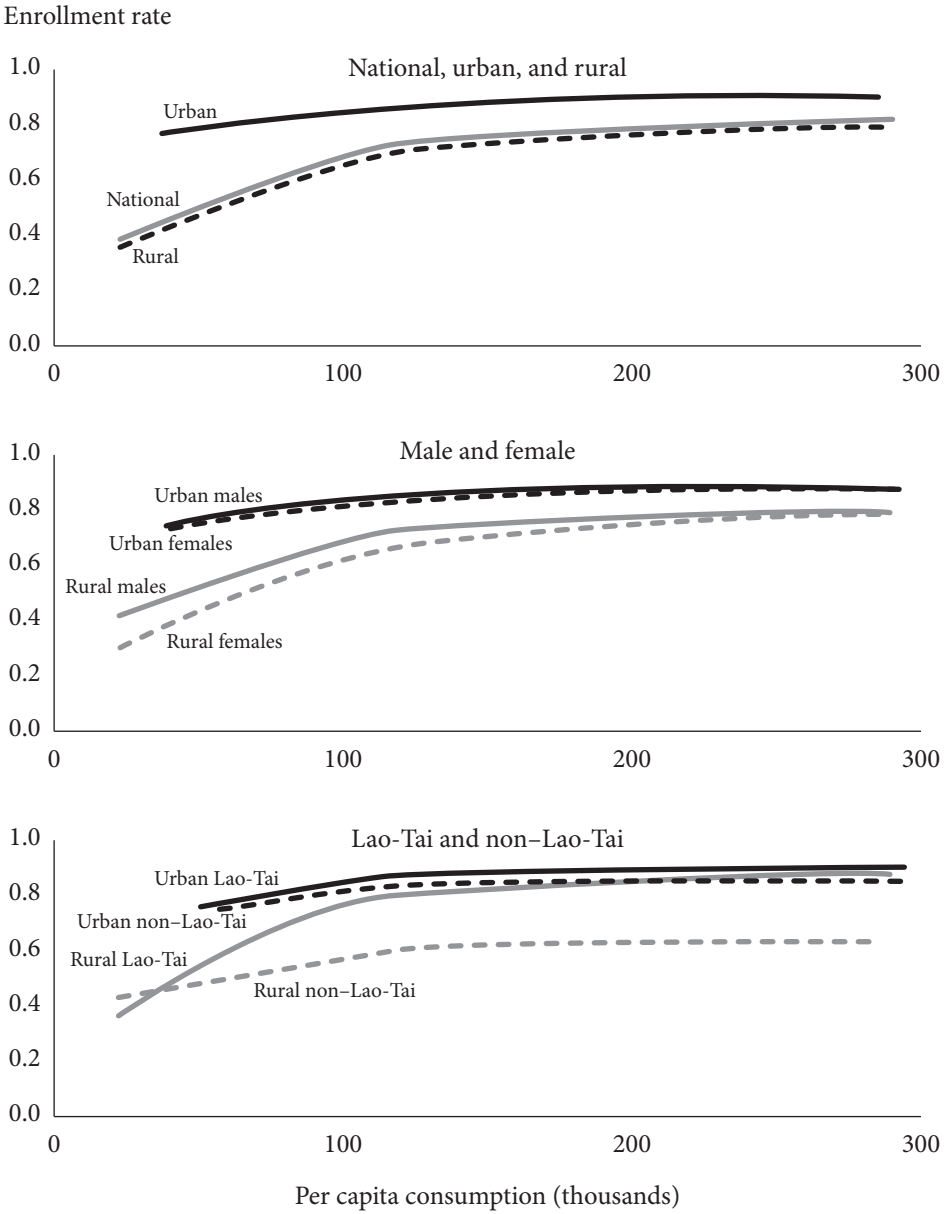
Source: LECS3, 2002/03.

size, especially in urban areas, we present results for these groups in an aggregated form. It is important to keep in mind, however, that there is heterogeneity within the non–Lao-Tai ethnolinguistic group.

Another way of examining the enrollment gaps across income groups is to look at the relationship between enrollment and household per capita consumption (figure 2.4).[8] Enrollment rises with household consumption, particularly in rural areas. This is true for all groups, although the urban-rural gap narrows at higher consumption levels. The enrollment rates of boys, girls, and Lao-Tai children converge at higher levels of consumption. In contrast, the urban-rural enrollment gap remains large even at higher consumption levels among the non–Lao-Tai groups. The largest schooling gap is for poor girls. At all levels of consumption, enrollment is also much higher in the lowlands than in the highlands (King and van de Walle 2005).

8 The nonparametric regression yields the estimated mean of the variable on the vertical axis calculated at each value of the horizontal axis, without assuming a parametric model linking the two variables. These nonparametric regressions are locally weighted smoothed scatter plots.

Figure 2.4. Per capita consumption and school enrollment by children 6–12 in Lao PDR, 2002/03



Note: Per capita consumption is deflated by a regional price index and expressed in real 2002/03 kip per month.

Source: LECS3, 2002/03.

A severe drop-off in enrollment occurs between primary and secondary school. At the lower secondary level, net enrollment is just 31 percent and gross enrollment 44 percent (table 2.3). This rate ranges from 7 percent for non–Lao-Tai rural girls to 54 percent for Lao-Tai urban boys. Bringing in the income dimension makes the picture even starker. For the poor, net secondary school enrollment ranges from 3 percent for rural non–Lao-Tai girls to about 33 percent for urban girls.

Why don't Laotian children go to school? Nationally, nearly 40 percent report never attending school because they are not interested. This response is vague but it could reflect low expected returns to schooling or low perceived relevance of school content. Another 27 percent report that the school is too far, 14 percent report having

Table 2.3. Net and gross lower secondary enrollment rates for children 12–15 in Lao PDR, by gender, urban/rural location, ethnolinguistic group, and poverty status, 2002/03 (percent)

	Urban				Rural					
	Lao-Tai		Total		Lao-Tai		non–Lao-Tai		Total	
Variable	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total										
Net enrollment rate	54.2	45.4	51.2	44.4	35.0	31.5	11.9	6.5	27.2	22.3
Gross enrollment rate	76.2	61.1	72.2	61.5	52.0	42.7	24.3	11.1	42.6	31.1
Number of observations	501	518	605	583	1,323	1,286	933	1,033	2,256	2,319
Nonpoor										
Net enrollment rate	60.0	48.2	57.2	47.4	39.5	37.0	15.5	10.3	33.6	29.4
Gross enrollment rate	84.9	64.3	81.0	64.5	57.4	49.7	32.7	15.8	51.3	40.1
Number of observations	401	424	459	456	980	908	435	503	1,415	1,411
Poor										
Net enrollment rate	31.2	32.8	31.2	32.8	21.3	17.4	8.7	2.9	14.7	10.0
Gross enrollment rate	41.7	46.8	42.3	49.9	35.6	24.7	16.6	6.6	25.7	15.4
Number of observations	100	122	146	127	343	378	498	530	841	908

Note: Non–Lao-Tai are not shown in urban areas because of the small number of observations. The denominator for the net and gross enrollment rates is the number of children 12–15. All estimates are population weighted.

Source: LECS3, 2002/03.

Table 2.4. Reasons why children ages 9–18 have never attended school (percent)

Reasons given	National	Urban	Rural
Too young	7.8	13.5	7.5
Too expensive	1.4	2.4	1.4
No interest in school	37.1	32.1	37.3
Had to work	13.6	19.4	13.3
School too far	27.1	9.2	28.1
Illness	3.4	3.9	3.4
Others	9.6	19.5	9.1

Source: LECS3, 2002/03.

to work, and 8 percent report that they (or their parents) believe they are too young. There are striking differences in the relative importance of these reasons in urban and rural areas (table 2.4). In urban areas, about one-third of children 9–18 not in school report that they have no interest, 19 percent report that they have to work, 13 percent that they are too young, and 9 percent that the school is too far away. By comparison, 37 percent of those in rural areas report that they have no interest, 13 percent that they have to work, 7 percent that they are too young, and 28 percent that the school is too far away. Across these groups, illness was a reason given by 3-4 percent of children.

The reasons why the poor and nonpoor do not enroll in school also differ, especially in urban areas. The urban poor are much more likely than the urban nonpoor to report that they have to work (27 percent versus 12 percent) or that the cost of schooling keeps them out of school (5 percent versus 0 percent). Illness is also much more common among the urban poor (8 percent versus 0 percent). The urban nonpoor are more likely to state "other" as a reason for not enrolling in school (27 percent versus 8 percent) and much more likely to report that the school is too far away (13 percent versus 5 percent).

In rural areas distance is more often an issue for the poor (32 percent) than the nonpoor (24 percent). Other differences across income groups are small. Interestingly, although not speaking the language of instruction at home is often noted in the literature as a deterrent to schooling, it was rarely cited. Similarly, the direct cost of schooling (as distinct from the opportunity cost) was rarely cited—even among urban poor, only 5 percent of respondents cited direct cost.

Late entry into primary school

Many children enter the primary cycle later than the prescribed age of six (table 2.5). The maximum enrollment rate at the primary level is achieved only by age 9 or 10. As a result, children remain in the primary cycle until their mid to late teens. Rural children who enter school do so later than urban children. A larger percentage of

Table 2.5. Age at which children currently 12 and 16 started school, Lao PDR, 2002/03

	Urban				Rural						Total
	Lao-Tai		Total		Lao-Tai		non–Lao-Tai		Total		
Age	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Total											
12-year-olds	6.6	6.6	6.7	6.7	7.3	7.4	8.8	9.1	7.8	7.9	7.6
16-year-olds	6.8	6.8	6.9	7.0	7.8	8.0	9.8	10.2	8.4	8.4	7.9
Nonpoor											
12-year-olds	6.4	6.5	6.6	6.6	7.0	7.2	8.5	8.7	7.4	7.6	7.3
16-year-olds	6.8	6.8	6.9	6.9	7.6	8.0	9.4	9.4	8.0	8.2	7.6
Poor											
12-year-olds	6.9	7.1	7.0	7.0	7.9	7.8	9.1	9.6	8.5	8.5	8.2
16-year-olds	6.2	7.0	7.1	7.2	8.8	8.0	10.2	11.0	9.4	9.1	8.9

Note: Non–Lao-Tai are not shown in urban areas because of the small number of observations.

Source: LECS3, 2002/03.

them—male or female, poor or nonpoor, Lao-Tai or not—are still at the primary level even in their late teens.

The average age at which children start school has declined over time, however. In 2002/03, nearly 80 percent of 10 year olds had entered school by age eight, compared with just more than 20 percent for those currently 18 years old.[9]

School continuation and completion

The probability of continuing in school falls markedly at the end of each basic cycle, particularly at the end of the primary cycle. In rural areas only about 70 percent of boys and less than 60 percent of girls are still in school at the end of grade 5. Continuation rates are much higher in urban areas at nearly all grades and the drop at the end of the primary cycle lower. The probability of remaining in school beyond fifth grade is lower for girls than for boys, for the poor than for the nonpoor, and for the non–Lao-Tai than the Lao-Tai, in both urban and rural areas. Children who continue through lower secondary school are highly likely to make it through the entire basic cycle, however, so the transition from the primary level appears to be a critical hurdle in the schooling process. Still, school continuation rates have been improving, with postprimary drop-off rates significantly higher for the 18–24 age cohort than for the 6–18 age group.

9 LECS3 included a question asking respondents the age at which they started school, so this information is not a computed age of entry as it often is in the literature.

Why is dropping out of school so pronounced at the end of the primary cycle? Thirty-one percent of 12-year-olds reported cost as the key reason why they dropped out of school, while 30 percent reported having no interest in continuing their studies. Older children cited three reasons most frequently: lack of interest, having to work, and distance to school. Few respondents cited lack of teachers or supplies or language of instruction. Distance to the school was cited as the key constraint more often in rural than urban areas (20 percent versus 7 percent), while the need to work was cited 35–40 percent of the time in both urban and rural areas, across consumption quintiles.

Explaining educational inequalities

What explains differences in school enrollment in Lao PDR? Economists have used household demand models to explain male-female schooling gaps in developing countries. According to those models, girls' schooling can lag behind boys' schooling for several reasons. Unequal provision of schools makes schooling more costly for girls than for boys. Social norms about gender roles within the family may mean that girls face higher opportunity costs of schooling due to their value in home production, or that they face fewer market opportunities in the future, or that, even when market returns do not differ between the sexes, they are less able to take advantage of market opportunities due to discrimination against women participating in the formal labor force. These reduce the returns on girls' schooling relative to those of boys. Finally, parents prefer that boys have more schooling than girls for traditional reasons.[10]

Much less research has been undertaken on the gap between urban and rural children, even though it is common and quite large in many countries.[11] Although the economic choice is made across households rather than within a household, urban-rural schooling gaps can be explained by the same factors that explain gender gaps: significant inequalities in the supply and quality of schools, in the costs associated with schooling (including the value of children's time in school), in expected market returns to education, and in credit constraints faced by households.[12] The working assumption is that the economics of the education decision is similar in urban and rural areas. This suggests a model that constrains the coefficients of the explanatory factors to be equal for urban and rural households, with any additional effect of place of residence captured by

10 See Haddad, Hoddinott, and Alderman (1997), Alderman and King (1998), and Schultz (2002) for reviews of the literature.

11 Rural education lags behind virtually everywhere in the world, with school participation rates differing by 16–20 percentage points across age groups. Gender gaps are smaller (1–6 percentage points in urban areas and 5–12 percentage points in rural areas). In developing countries gender differences in schooling are largely a rural phenomenon (Orazem and King 2007).

12 Urban-rural inequalities and ethnic and racial inequalities in education have been found to determine school enrollment and schooling attainment in Cambodia (World Bank 2005), China (Hannum 2002), Malaysia (Anderson, King, and Wang 2002), Peru (Diaz and others 2004), South Africa (Case and Deaton 1999), Turkey (Tansel 2002), and Vietnam (Baulch and others 2004; Behrman and Knowles 1999).

a dummy variable for urban or rural residence. In this model any difference in the elasticity of demand with respect to household income, for example, along the full range of household incomes (consumption) in urban and rural areas, can be considered simply by using a nonlinear specification for the income (consumption) variable.

However, a simple comparison of incomes, costs, or returns in urban and rural areas may be misleading. Household members engage in very different activities in urban and rural areas. Compared with urban areas, rural areas have a greater incidence of unpaid home production and self-employment; measures of the opportunity costs of schooling and the market returns to schooling therefore capture basic differences in the tradeoffs and opportunities a household faces.

To illustrate this structural difference between urban and rural areas, consider the response of Indonesian households to the country's 1998 financial crisis. Thomas and others (2004) find that per capita household incomes fell 25 percent in urban areas and 15 percent in rural areas. Although household incomes fell less in rural areas, children reduced the time spent in school more, suggesting higher income elasticities. This negative effect was largest among the poorest households.

Even less attention has been given to schooling inequality across ethnic (or racial) groups in developing countries. Data on ethnic affiliation are often not available due to the political sensitivity of this issue; household surveys are more likely to ask about the main language spoken in the household rather than ethnicity. Moreover, ethnic affiliation is difficult to interpret in countries with a multitude of minority groups. Yet ethnic (and racial) differences correspond to significant differences in education in many countries. In several Latin American countries, indigenous groups complete many fewer years of schooling than their nonindigenous peers (Hall and Patrinos 2006). The average nonindigenous Paraguayan has seven years of schooling, while the average indigenous Paraguayan has just 2.2 years. In Bolivia and Chile, indigenous students score 0.3–0.5 standard deviations below nonindigenous students on math and Spanish exams, with only 20–40 percent of the difference attributable to socioeconomic inequality. Geographic isolation is often a primary reason for ethnic disparities in education: in Lao PDR ethnic minorities live predominately in rural areas and the highlands. Language differences are also a barrier, one that is not solved easily, especially in a country with many ethnolinguistic groups.

We examine the demand for schooling in Lao PDR using a set of individual and household data that reflect the factors discussed above. In addition to gender, urban-rural location, and ethnolinguistic affiliation, we include measures of household income, parental education, the age-gender composition of the household, and village and school characteristics.[13] Before reporting these estimates, first we examine the differences in three factors—direct school costs incurred by the household, the

13 The elasticity of demand for schooling with respect to household income or expenditure can be larger than in developed countries. For example, elasticities reported by (or derived from reported estimates) by Bhalotra and Heady (2003) for Pakistan and Handa (2002) for Mozambique are near or greater than 1.

opportunity cost of children's time, and aspects of school supply—and how they may affect schooling decisions.

Private expenditures. Underlying the relationship between per capita household consumption and average years of schooling in Lao PDR is the fact that schooling is not free. Household education costs include direct expenditures as well as forgone income from child labor. Turning first to the direct costs of primary education, per student education expenditures account for 16 percent of per capita household expenditures in urban areas and 9 percent in rural areas. For secondary education, schooling consumes 21–22 percent of per capita household expenditures in both urban and rural areas.

Expenditures per primary school student are much lower than expenditures per secondary school student, at about 40 percent of secondary school expenditures in rural areas and 60–80 percent in urban areas (table 2.6). Per student expenditures for both levels are generally lower in rural than in urban areas, and the poor spend less in absolute amounts than do the nonpoor.

Uniforms account for the largest share of household education expenditures at both the primary and secondary levels, about 50 percent in rural areas and 35–40 percent in urban areas. The second-largest cost in rural areas is textbooks and materials (20–25 percent); in urban areas, it is transportation, meals, and lodging (21 percent). Tuition and parent-teacher association fees account for less than 10 percent. Tuition accounts for less than 5 percent in rural areas and about 7 percent in urban areas; parent-teacher association fees represent an additional 2–3 percent in rural and urban areas.

Higher opportunity costs for rural girls. The opportunity costs of a child's time in school could deter school enrollment. The average Laotian child between 10 and 16 years of age spends 11–12 hours sleeping, eating, and engaging in personal care, devoting the rest of the day to leisure, work, school, travel, and other activities (table 2.7).[14] School (including time spent doing homework) accounts for only a small part of each day—from 2.0 hours for poor rural girls to 4.4 hours for nonpoor urban boys. Boys—poor and nonpoor, urban and rural—spend a larger part of each day on leisure and schooling than do girls. By contrast, girls spend the majority of their disposable time working, both inside and outside the home.

Poor rural girls spend the fewest hours in school, working 5.3 hours a day instead; nonpoor rural girls work 4.6 hours. Female labor in rural areas is almost evenly divided between on-farm agricultural work (2.0–2.2 hours, spent primarily tending rice, other crops, and animals) and domestic work (2.0–2.5 hours). Domestic work includes cooking, cleaning, washing, collecting wood and water, and taking care of children and elderly household members. Poor rural girls spend almost three hours

14 This information is produced by linking household and individual level data from the LECS3 with a module on time use that was administered to all individuals ages 10 and older residing in sample households.

Table 2.6. Household spending on education and component shares, by urban/rural location, ethnolinguistic group and poverty status, Lao PDR, 2002/03 (thousands of kip per month)

	Urban			Rural		
	Lao-Tai	non–Lao-Tai	Total	Lao-Tai	non–Lao-Tai	Total
Total						
Exp. per primary student	32.5	15.2	30.5	12.9	10.6	12.1
Share to tuition	7.2	6.6	7.1	2.1	3.5	2.6
Share to PTA fees	2.0	2.3	2.0	2.1	2.5	2.2
Share to uniforms	32.5	42.7	33.8	47.9	53.5	50.0
Share to textbooks & materials	15.5	24.3	16.6	21.5	24.8	22.7
Share to transportation/ meals/boarding	22.8	6.5	20.8	11.5	5.2	9.2
Other expenses	20.0	17.6	19.7	14.9	10.6	13.3
Exp. per lower sec. student	43.5	22.0	41.8	30.0	31.8	30.3
Share to tuition	7.2	5.5	7.0	3.0	3.7	3.2
Share to PTA fees	1.9	2.4	1.9	1.9	2.2	2.0
Share to uniforms	34.2	47.5	35.4	43.8	47.9	44.6
Share to textbooks & materials	14.7	24.3	15.5	20.0	19.8	19.9
Share to transportation/ meals/boarding	22.7	5.4	21.3	15.2	13.4	14.9
Other expenses	19.3	15.0	18.9	16.1	13.1	15.5
Nonpoor						
Exp. per primary student	35.6	18.2	34.1	14.3	12.3	13.8
Share to tuition	7.6	6.8	7.5	2.0	3.5	2.4
Share to PTA fees	1.9	1.4	1.9	2.1	2.6	2.3
Share to uniforms	31.0	42.6	32.1	47.0	51.0	48.2
Share to textbooks & materials	15.3	23.0	16.0	20.6	24.0	21.6
Share to transportation/ meals/boarding	24.7	6.6	23.1	12.5	6.3	10.7

a day each fetching water, collecting firewood, and caring for other household members. Rural boys spend 1.7–2.1 hours a day farming and about an hour hunting and fishing. They spend much less time helping with household chores.

Urban children who work are more likely than rural children to be involved in part-time wage work or self-employment activities. Both boys and girls spend about

	Urban			Rural		
	Lao-Tai	non–Lao-Tai	Total	Lao-Tai	non–Lao-Tai	Total
Other expenses	19.5	19.7	19.5	15.8	12.7	14.9
Exp. per lower sec. student	45.5	—	44.4	31.0	33.7	31.4
Share to tuition	7.2	—	7.1	3.1	3.5	3.1
Share to PTA fees	1.8	—	1.8	2.0	1.7	2.0
Share to uniforms	34.0	—	34.5	43.6	46.1	44.0
Share to textbooks & materials	14.6	—	15.1	19.4	20.1	19.5
Share to transportation/ meals/boarding	23.9	—	22.8	15.6	14.6	15.4
Other expenses	18.6	—	18.6	16.4	14.0	16.0
Poor						
Exp. per primary student	18.9	11.6	17.1	8.9	8.7	8.8
Share to tuition	5.5	6.4	5.7	2.4	3.5	3.0
Share to PTA fees	2.4	3.4	2.7	1.9	2.4	2.1
Share to uniforms	38.7	42.9	39.8	50.4	56.3	53.4
Share to textbooks & materials	16.6	26.0	19.0	24.0	25.7	24.9
Share to transportation/ meals/boarding	14.7	6.3	12.5	8.8	3.9	6.4
Other expenses	22.2	15.1	20.3	12.5	8.3	10.3
Exp. per lower sec. student	29.3	—	26.9	24.9	28.0	25.9
Share to tuition	6.8	—	6.7	2.7	4.3	3.2
Share to PTA fees	2.5	—	2.6	1.7	3.1	2.1
Share to uniforms	35.7	—	39.7	44.9	51.3	46.9
Share to textbooks & materials	15.6	—	17.6	22.9	19.2	21.8
Share to transportation/ meals/boarding	15.2	—	12.8	13.3	10.9	12.6
Other expenses	24.2	—	20.6	14.5	11.2	13.5

Note: Figures are calculated conditional on having one or more children enrolled in school. Expenditures are deflated by a regional price index and expressed in thousands of real 2002/03 kip per month. Expenditures per lower secondary student for the non–Lao-Tai urban poor and nonpoor are omitted because of small sample size.

Source: LECS3, 2002/03.

an hour a day on agricultural work. Urban boys spend about 30–45 minutes fishing and hunting, while girls devote about 30 minutes to sewing and weaving. Overall, children spend about an hour on travel and "other" activities, with urban children spending more time on these activities than rural children.

Table 2.7. Time use by children 10–16, by urban/rural location, poverty status, and gender (hours per day)

	Urban				Rural			
	Nonpoor		Poor		Nonpoor		Poor	
Activity	Male	Female	Male	Female	Male	Female	Male	Female
Sleeping, eating, personal care	11.5	11.4	11.6	11.2	11.6	11.5	11.8	11.6
Leisure	4.6	4.0	5.0	4.4	4.2	3.8	4.3	3.9
School	4.4	3.8	3.4	3.3	3.7	3.0	2.6	2.0
Remunerative work	1.8	2.1	2.5	2.3	2.7	2.7	3.1	2.8
Work as employee	0.3	0.2	0.5	0.2	0.1	0.1	0.1	0.1
Self-employed	0.2	0.6	0.1	0.3	0.1	0.1	0.0	0.0
Agricultural work	0.7	0.7	1.1	1.1	1.7	2.0	2.1	2.2
Tending rice	0.3	0.4	0.3	0.5	0.7	1.1	1.1	1.3
Tending other crops	0.1	0.1	0.4	0.4	0.3	0.4	0.3	0.5
Tending animals	0.3	0.1	0.5	0.2	0.7	0.5	0.8	0.4
Hunting/fishing	0.5	0.1	0.7	0.1	0.8	0.1	0.8	0.2
Nonagricultural work, unpaid	0.1	0.4	0.1	0.6	0.0	0.4	0.0	0.2
Domestic work	0.7	1.9	0.9	2.0	0.8	1.9	1.0	2.5
Cooking	0.2	0.6	0.1	0.7	0.1	0.5	0.2	0.5
Washing, cleaning	0.3	0.8	0.3	0.5	0.1	0.4	0.1	0.3
Caring for young and elderly family members	0.1	0.3	0.3	0.4	0.2	0.3	0.3	0.8
Collecting wood/ fetching water	0.1	0.2	0.2	0.3	0.3	0.7	0.4	0.9
Buying/shopping	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
Travel, other	1.0	0.9	0.7	0.9	1.1	1.1	1.2	1.2
Total work and travel	*3.5*	*4.9*	*4.1*	*5.2*	*4.6*	*5.7*	*5.3*	*6.5*

Note: Schooling includes time spent on homework.

Source: LECS3, 2002/03.

Fewer and lower quality schools for non–Lao-Tai children. In many other countries, the availability of schools within a reasonable distance has been shown to be an important determinant of school attendance.[15] Lao PDR had 8,573 primary schools in 2004, or

15 See Duflo (2004), Handa (2002), and Tansel (2002) for the effect of school supply on enrollment in Indonesia, Mozambique, and Turkey, respectively.

15 primary schools per 10,000 people. According to our data, 84 percent of the population lives in a village with a primary school, but this figure varies across urban and rural areas and therefore across ethnolinguistic groups too (table 2.8). In urban areas 84 percent of Lao-Tai and 70 percent of non–Lao-Tai have access to a primary school. The percentage of the population served by a primary school is higher in rural areas (88 percent of Lao-Tai and 80 percent of non–Lao-Tai), but as we see below, a larger percentage of schools in these areas do not offer the full cycle or are multigrade. In both urban and rural areas, this measure of school supply does not necessarily mean that children residing in a village without a school do not have access to a primary school, because they can attend a school in a neighboring village.

Although the number of lower secondary schools in Lao PDR increased between 1989 and 2004, a far smaller percentage of the population has access to lower secondary schools than to primary schools—31 percent of nonpoor urban Lao-Tai and 3 percent of poor rural non–Lao-Tai. Upper secondary schools are even scarcer—only 3 percent of Lao-Tai and 1 percent of non–Lao-Tai population are served by such schools.

School quality also varies. To summarize several measures of quality, we construct a school quality index, based on a regression of enrollment on individual school characteristics.[16] Our measure is based on school inputs and facilities rather than level of student performance. The index varies from 0.17 to 1.0, with a mean of 0.60. Values are lower for rural areas than urban areas and lowest for the poor, rural, non–Lao-Tai population.

School quality rises with household living standards (figure 2.5). In rural areas school quality rises with consumption levels, leveling off for consumption levels above the rural mean of 140,000KN per capita. The living standards gradient is less pronounced in urban areas. Except for the very poorest among them, non–Lao-Tai groups in urban areas tend to have access to better schools than do the Lao-Tai. In contrast, in rural areas Lao-Tai groups tend to have access to better schools.

Inequality in the supply of teachers deserves special attention. Teacher deployment is partly the result of a quota system that requires newly trained teachers to return to their home district. This requirement restricts teacher mobility and the capacity of the school system to balance supply (Asian Development Bank 2000). The average pupil-teacher ratio for primary schools in Lao PDR is about 30 to 1. It is slightly higher in urban areas and for non–Lao-Tai, but the differences are not large. The small difference reflects the government's policy of allocating an additional teacher to a school when enrollment increases by 33 students.

Balancing teacher supply is not just about getting the numbers right—the distribution of teacher characteristics also matters. In urban areas two-thirds of teachers are

16 The estimated regression coefficients on school characteristics provide a way of aggregating individual school characteristics, using their relative effects on schooling enrollment (purged of household and individual effects) as weights. The resulting quality estimates are then normalized as a continuous variable between zero and one. The index is plotted against expenditure per capita in figure 2.5.

Table 2.8. Access to primary, lower secondary, and upper secondary schools in Lao PDR, by urban-rural location and ethnolinguistic affiliation, 2002/03

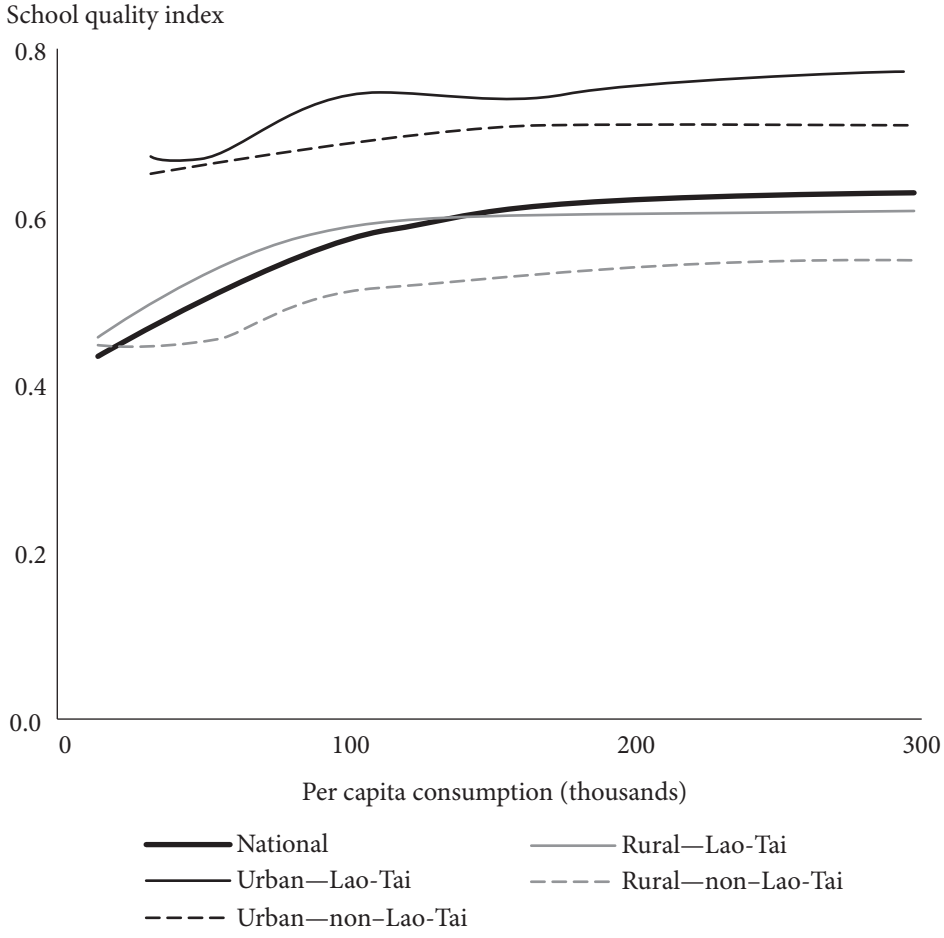
	Percentage of population living in village with school					
	Urban		Rural		Total	
Variable	Lao-Tai	non–Lao-Tai	Lao-Tai	non–Lao-Tai	Lao-Tai	non–Lao-Tai
Total						
Primary school	83.6	70.2	87.6	80.0	86.4	79.3
Lower secondary school	29.2	22.7	16.6	3.9	20.5	5.2
Upper secondary school	11.3	14.1	4.9	1.0	6.8	1.9
Number of observations	7,812	1,358	20,841	19,532	28,653	20,890
Nonpoor						
Primary school	82.4	80.5	88.0	79.1	86.1	79.2
Lower secondary school	30.6	26.6	18.4	4.7	22.6	6.4
Upper secondary school	11.8	18.2	6.4	2.0	8.3	3.2
Number of observations	6,505	762	14,589	9,362	21,094	10,124
Poor						
Primary school	89.6	57.0	86.6	80.8	87.2	79.3
Lower secondary school	22.5	17.6	12.1	3.3	14.3	4.1
Upper secondary school	8.7	8.7	1.0	0.2	2.6	0.7
Number of observations	1,307	596	6,252	10,170	7,559	10,766

Source: LECS3, 2002/03.

women, perhaps giving an impetus for more girls going to school. The opposite is true in rural areas, where teaching represents a coveted opportunity for wage employment for educated men. Lao-Tai children are taught predominantly by Lao-Tai teachers (90 percent in urban areas and 80 percent in rural areas). Children from other ethnolinguistic groups are much less likely to be taught by a Lao-Tai teacher, suggesting that schools tend to rely on local teachers, especially in rural areas, most likely because of the tremendous language diversity in those areas.[17] The educational attainment and experience of the average teacher are highest in urban areas for Lao-Tai students and lowest in rural areas for non–Lao-Tai students. In schools accessible to Lao-Tai students in urban

17 There are advantages and disadvantages to using local teachers. Teacher attrition is lower among local teachers and they are better able to communicate with students and parents. But local teachers in non–Lao-Tai areas may have limited facility in the majority language, and they may not be equipped to teach the national curriculum.

Figure 2.5. School quality and per capita consumption by children 6–15 in Lao PDR, 2002/03



Note: Per capita consumption is deflated by a regional price index and expressed in real 2002/03 kip per month. School quality is given by an index that is calculated from the coefficients on school characteristics in a regression explaining enrollment and normalized to be between 0 and 1.

Source: LECS3, 2002/03.

areas teachers have an average of 10 years of schooling and about 15 years of experience. In contrast, teachers in schools accessible to non–Lao-Tai children in rural areas have nine years of schooling and 9 years of experience—perhaps reflecting the recent expansion of schools in areas where the rural non–Lao-Tai live. The differences in education are not large, but the experience gap of six years is substantial and may result in worse teacher performance. We have no evidence of the impact on student learning.

Results of the model: Explaining school enrollment and attainment

We estimate a model with individual, household, community, and school variables (table 2.9). We estimate the model for the full sample of children 6–15 years of age, for six subgroups based on residence, gender, and ethnolinguistic affiliation, and for more disaggregated samples based on all three characteristics at the same time (see tables 2A.1 and 2A.2 for variable definitions and basic descriptive statistics). We find striking differences in the normalized coefficients of the probit model, estimated as marginal effects, between the samples of boys and girls, urban and rural children, and Lao-Tai and non–Lao-Tai children. Indeed, Wald tests reject equality of the models across these groups.

To aid interpretation, we transformed the estimated probit coefficients into marginal effects, evaluated at the means. Standard errors in all estimated regressions have been corrected for heteroscedasticity and clustering at the village level.

Estimates for the full sample

Our results confirm the inequalities documented above: girls are 8 percent less likely to be enrolled in school than boys, and non–Lao-Tai children (except for Mon-Khmers) are significantly less likely to attend school than Lao-Tai children, with this disadvantage being largest (by 20 percent) for Chine-Tibetans. The results also confirm that enrollment rates peak at ages 9–11 and decline thereafter. A disability lowers a child's probability of attending school by 13 percent.[18]

Household size does not matter for enrollment, but the composition of the household does.[19] Controlling for household size, the higher the proportion of household members under six or 6–16 years of age, the lower the probability that a child is in school. This negative association (of 15–24 percent) is largest with respect to the share of under-six children. One interpretation of these results is that they capture the effect of schooling costs, both direct and opportunity costs, on families with more children. Surprisingly, even the number of adult men relative to adult women in the household is negatively associated with school enrollment, albeit with less statistical significance.[20]

We use higher household education expenditures to measure the family's ability to incur schooling costs, its desire to have more highly educated children, or both. We find a positive association with enrollment, although the expenditure gradient is not large. All else equal, increasing log per capita consumption of the household by

18 Using Demographic and Health Survey data for seven countries, Filmer (2005) estimates that, after controlling for age, gender, residence, and household wealth, the enrollment gap due to a child's disability is 15.8–67.4 percentage points. In Cambodia he estimates that disability lowers enrollment by 26.6 percent for children ages 6–17.

19 Since our regression also includes log per capita expenditures, the log of household size measures whether there are scale economies in schooling. The results indicate that there are none.

20 Jacoby (1994) and Bhalotra and Heady (2003) have included a similar set of household composition variables and have interpreted the results as indicating also the opportunity cost of schooling.

Table 2.9. Regression results on probability of attending school in Lao PDR, 2002/03

Independent variable	Full sample	Male	Female	Urban	Rural	Lao–Tai	Non–Lao–Tai
Child/household characteristics							
Child is female	–0.08***			–0.01	–0.09***	–0.03	–0.16***
	(7.63)			(1.16)	(7.77)	(3.89)	(6.92)
Child is disabled	–0.13***	–0.13**	–0.12*	–0.12**	–0.13**	–0.16***	–0.06
	(2.87)	(2.19)	(1.83)	(2.13)	(2.40)	(3.01)	(0.77)
Child is 7	0.11***	0.11***	0.10***	0.02*	0.14***	0.08***	0.18***
	(9.67)	(9.38)	(5.02)	(1.68)	(9.63)	(7.47)	(6.31)
Child is 8	0.16***	0.14***	0.16***	0.04***	0.19***	0.11***	0.25***
	(15.52)	(12.56)	(9.51)	(3.66)	(15.42)	(11.68)	(10.12)
Child is 9–11	0.26***	0.25***	0.27***	0.07***	0.30***	0.18***	0.40***
	(22.07)	(18.24)	(14.91)	(5.61)	(21.43)	(16.42)	(15.52)
Child is 12	0.18***	0.16***	0.18***	0.05***	0.21***	0.12***	0.31***
	(16.85)	(14.87)	(10.02)	(4.57)	(16.27)	(11.74)	(12.43)
Child is 13	0.16***	0.16***	0.14***	0.04***	0.19***	0.10***	0.28***
	(13.40)	(13.08)	(6.51)	(3.01)	(13.22)	(9.53)	(10.23)
Child is 14 or older	0.12***	0.14***	0.07***	0.03**	0.14***	0.07***	0.22***
	(8.20)	(10.77)	(2.70)	(2.18)	(7.81)	(5.56)	(6.90)
Child is first or second born	3.3e–03	–2.3e–04	3.5e–03	0.01	–9.2e–04	–0.01	0.02
	(0.32)	(0.02)	(0.22)	(1.13)	(0.08)	(0.88)	(1.12)
Birth order is missing	–0.04**	–0.03	–0.05*	–0.04	–0.04	–0.02	–0.09**
	(2.07)	(1.38)	(1.79)	(1.45)	(1.84)	(0.81)	(2.55)
Log household size	–5.0e–05	0.01	–0.01	–2.4e–03	–6.4e–04	–3.4e–03	–0.01
	(0.00)	(0.50)	(0.35)	(0.09)	(0.03)	(0.18)	(0.32)
Share of male adults, 17 and up	–0.15**	–0.03	–0.30***	–0.02	–0.20**	–0.08	–0.34*
	(2.01)	(0.33)	(2.76)	(0.31)	(2.20)	(1.12)	(1.97)
Share of males 6–16	–0.21***	–0.12	–0.35***	–0.02	–0.29***	–0.09*	–0.47***
	(3.83)	(1.60)	(4.26)	(0.25)	(4.26)	(1.79)	(3.67)
Share of females 6–16	–0.19***	–0.10	–0.31***	–0.05	–0.25***	–0.10**	–0.37***
	(3.55)	(1.61)	(3.95)	(0.91)	(3.71)	(2.01)	(2.96)
Share of boys 0–6	–0.23***	–0.13*	–0.35***	–0.23***	–0.24***	–0.15**	–0.41***
	(3.57)	(1.75)	(3.52)	(2.89)	(3.20)	(2.24)	(3.17)
Share of girls 0–6	–0.24***	–0.12	–0.38***	–0.15*	–0.28***	–0.16**	–0.36***
	(3.55)	(1.54)	(3.75)	(1.82)	(3.49)	(2.06)	(2.79)
Child is Mon-khmer	6.7e–04	0.01	–0.01	–0.03	0.01		
	(0.04)	(0.36)	(0.28)	(1.40)	(0.32)		
Child is Chine-Tibet	–0.20***	–0.18***	–0.25***	–0.22**	–0.20***		
	(4.31)	(3.93)	(2.95)	(2.25)	(3.83)		
Child is Hmong-Iu Mien	–0.02	–0.01	–0.03	–0.04	–0.01		
	(0.85)	(0.31)	(0.87)	(0.90)	(0.38)		

(continued)

Table 2.9. Regression results on probability of attending school in Lao PDR, 2002/03 (continued)

Independent variable	Full sample	Male	Female	Urban	Rural	Lao–Tai	Non–Lao–Tai
Log of per capita consumption	0.06*** (5.05)	0.06*** (4.59)	0.07*** (3.84)	0.02** (2.22)	0.07*** (4.73)	0.06*** (5.02)	0.06** (2.08)
Male household head	0.17* (1.86)	0.18* (1.88)	0.19 (1.55)	0.02 (0.52)	0.05 (0.26)	0.23* (1.79)	0.11 (0.54)
Age of household head	–1.3e–03 (0.41)	–0.01*** (2.62)	0.01 (1.53)	–0.01 (1.37)	–1.8e–04 (0.05)	–1.0e–03 (0.34)	2.0e–03 (0.31)
Age of head squared	1.7e–05 (0.53)	9.2e–05** (2.55)	–6.5e–05 (1.27)	8.4e–05 (1.44)	5.6e–06 (0.15)	1.5e–05 (0.46)	–9.6e–06 (0.14)
Male head/spouse's years of schooling	0.01*** (4.75)	0.01*** (5.00)	0.01** (2.55)	2.7e–03** (2.14)	0.01*** (4.40)	4.3e–03*** (2.82)	0.02*** (3.69)
Female head/spouse's years of schooling	0.01*** (5.26)	0.01*** (3.41)	0.02*** (4.71)	1.3e–03 (0.71)	0.02*** (5.57)	0.01*** (4.56)	0.02*** (3.46)
School characteristics							
School has electricity	0.06** (2.27)	0.03 (1.34)	0.09** (2.44)	0.01 (0.67)	0.08** (1.98)	0.01 (0.62)	0.10 (0.77)
School is complete and does not have multigrade classrooms	0.25*** (11.85)	0.20*** (10.19)	0.30*** (10.31)	0.11*** (6.27)	0.28*** (9.92)	0.19*** (11.14)	0.36*** (6.59)
Each student has desk	0.03 (1.32)	0.02 (1.05)	0.04 (1.14)	–0.02 (0.57)	0.03 (1.14)	–0.02 (0.68)	0.12** (2.39)
Share of leaky classrooms	–0.05*** (2.83)	–0.04** (2.12)	–0.05** (2.37)	0.02 (0.87)	–0.05** (2.42)	–0.05*** (3.28)	–0.07 (1.52)
Share of male teachers	–0.02 (0.95)	0.01 (0.63)	–0.05* (1.73)	0.02 (0.84)	–0.03 (1.38)	–0.01 (0.52)	–0.08 (1.62)
Share of Lao-Tai teachers	0.05** (2.16)	0.02 (0.86)	0.08** (2.52)	0.18*** (3.20)	0.04 (1.54)	0.03 (1.20)	0.09*** (2.06)
Teachers' years of schooling	6.4e–04 (0.16)	1.3e–03 (0.35)	4.7e–04 (0.08)	0.01 (0.94)	–3.2e–04 (0.07)	–7.2e–04 (0.16)	1.3e–03 (0.17)
School has official principal	–0.11* (1.86)	–0.10* (1.81)	–0.09 (1.12)	0.07 (1.13)	–0.10 (1.26)	–0.08* (1.87)	–0.07 (0.46)
Principal is male	0.06* (1.90)	0.03 (1.20)	0.07* (1.73)	0.01 (0.75)	0.05 (1.16)	0.03 (1.29)	0.06 (0.74)
Principal is Lao-Tai	–0.03 (1.32)	–3.8e–03 (0.16)	–0.07* (1.95)	–0.02 (1.31)	–0.03 (1.07)	–0.02 (0.74)	–0.11 (1.55)
Principal's years of schooling	2.8e–03 (0.58)	2.0e–03 (0.39)	2.8e–03 (0.44)	–8.0e–04 (0.28)	5.2e–04 (0.08)	3.7e–03 (1.03)	–0.01 (0.37)
Kilometers to closest city	–4.6e–04*** (3.70)	–4.3e–04*** (3.54)	–5.2e–04*** (2.97)	3.0e–04*** (2.80)	–5.5e–04*** (3.65)	–3.0e–04*** (2.98)	–7.8e–04*** (2.60)

Independent variable	Full sample	Male	Female	Urban	Rural	Lao–Tai	Non–Lao–Tai
Kilometers to closest paved road	3.8e–04*** (2.72)	4.6e–04*** (3.18)	2.7e–04 (1.37)	1.5e–04** (2.02)	3.0e–04 (1.59)	2.6e–04** (2.09)	8.0e–04*** (2.63)
Kilometers to closest lower secondary school	–9.8e–04*** (3.44)	–1.2e–03*** (4.10)	–7.7e–04* (1.77)	5.6e–04** (2.06)	–1.4e–03*** (3.39)	–7.1e–04** (2.53)	–1.4e–03* (1.93)
Tuition is compulsory	0.03* (1.73)	0.02 (1.09)	0.04* (1.83)	0.02 (1.24)	0.02 (1.20)	0.02 (1.47)	0.05 (1.51)
Examination fees are compulsory	–0.02 (1.55)	–0.03** (2.22)	–0.02 (0.69)	–0.03** (2.16)	–0.02 (1.13)	–0.02 (1.33)	–0.02 (0.53)
Mean walking time to school (min.)	–1.7e–04 (1.00)	–4.1e–04** (2.50)	6.2e–05 (0.22)	–3.6e–04** (2.14)	–1.7e–04 (0.78)	1.9e–05 (0.11)	–4.2e–04 (1.03)
Village characteristics							
Highlands	–0.03* (1.91)	–0.02 (0.93)	–0.05** (2.12)	–1.4e–03 (0.04)	–0.04** (2.01)	–0.01 (0.75)	–0.04 (1.01)
Priority 1 districts	0.01 (0.65)	0.02 (1.30)	–5.0e–05 (0.00)	–4.7e–03 (0.20)	0.02 (0.86)	3.8e–03 (0.20)	0.02 (0.62)
Priority 2 districts	–0.08*** (2.96)	–0.07*** (2.62)	–0.09** (2.40)	–3.1e–03 (0.11)	–0.07** (2.43)	–0.05** (2.35)	–0.05 (0.77)
Number of observations	11,059	5,482	5,470	1,831	9,228	6,925	4,144
Pseudo R^2	0.28	0.27	0.30	0.31	0.28	0.27	0.26
Wald test: χ^2		786.0		176.5		2,215.9	
Prob > χ^2		0.00		0.00		0.00	

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Partial derivatives for each variable rather than probit coefficients are presented here. A full set of province urban/rural dummies are included in all regressions but not shown for ease of presentation. Z-statistics based on standard errors corrected for heteroskedasticity and clustering at the village level appear in parentheses.

Source: LECS3, 2002/03.

one unit—increasing the level of consumption by a factor of almost three—increases the probability of a child going to school by 6 percent.[21] The probit regression of schooling on per capita expenditures (and no other regressors) gives a highly significant (z-stat = 11.2) estimated coefficient of 0.21—more than three times the size of the

21 The national panel in figure 2.4 shows a strong relationship between economic welfare and school enrollment. It would be tempting to draw strong implications from figure 2.4 about the importance of economic growth. However, controlling for other characteristics, living standards are seen to be much less central to achieving primary school enrollments.

partial regression coefficient including the controls. Controlling for other observable characteristics, however, this coefficient falls, suggesting a considerably lower importance of living standards for achieving universal primary school enrollment.

Related to the expenditure variable is the completed education level of the household head and his or her spouse, but having controlled for household expenditures, these education variables are probably measuring parental preferences for schooling. We expect more educated parents to value their children's schooling more highly—indeed child enrollment is associated positively with parents' education, albeit at a weaker level than expenditures.

Our estimates also include school factors for which we have measures.[22] In general, these variables pertain to the school nearest to the household, whether within the community or in the next village or city—that is, the school attended by most households in the sample area.[23] Few past studies have had access to data on the family and community background of children as well as the characteristics of the schools available to them. Those that used both sets of data find that family background effects tend to dominate school effects (Levin 1995; Glewwe 2002). Past studies on Asian countries have found that distance to school deters enrollment (Anderson, King, and Wang 2002 for Malaysia; Maliki 2005 for Indonesia), tuition reduces enrollment (Behrman and Knowles 1999 for Vietnam), and having more educated teachers increases enrollment (World Bank 2005 for Cambodia).

In Lao PDR 71 percent of schools are incomplete (they do not offer all primary grades), have multigrade classrooms, or both. These schools are associated with weaker outcomes, but children who have access to a complete primary school are 25 percent more likely to be enrolled.[24] Better school infrastructure—as measured by the availability of electricity, the existence of desks for each student, and the physical condition of classrooms (as measured by the proportion of classrooms with nonleaking roofs)—also promotes enrollment, though the effect is considerably smaller than having a complete school without multigrade classrooms. The distance from the primary school to a city or to a lower secondary school and the average time it takes for a student to walk from home are negatively related to enrollment. Unexpectedly, the school's distance to a paved road is positively, not negatively, associated with a child's enrollment, although this effect is negligible.

22 Compared with the basic model without school variables, the coefficients of the household and child characteristics in the expanded model remain qualitatively the same, but there is loss in coefficient size for some due to a positive correlation between household and community variables and the added school variables. The ethnicity variables also lose statistical significance, except for the variable representing Chine-Tibetan affiliation. In addition a child is now more likely to be enrolled in school in male-headed households.

23 We do not attempt to address the statistical issue of endogenous school characteristics in our estimates because school choice is very limited in Lao PDR.

24 Incomplete schools have also been found to raise dropout rates and repetition rates in Cambodia (World Bank 2005).

Our results on school fees are contradictory and warrant discussion: higher tuition increases enrollment, whereas higher examination fees reduce enrollment. Neither of these results is statistically significant in the full-sample model. As a result of a policy to reduce tuition fees, these fees represent only a small share of education expenditures (3–7 percent). One possible explanation for tuition's positive coefficient is that, though small, tuition signals a school's quality and its access to extrabudgetary resources, as tuition fees are generally retained by the schools and "always dedicated to operating expenses/current management and small investment" (European Union 2005, 31).

We turn now to the characteristics of teachers and principals. Differences in average teacher education across groups are not large, but our probit estimates suggest that those differences matter.[25] Teachers' ethnolinguistic affiliation may be reflecting the quality of teachers' education and training, because having more Lao-Tai teachers in the school, irrespective of the ethnicity of the majority of students, increases enrollment. While the proportion of male and female teachers does not seem to matter, having a male principal does—more than the principal's ethnic affiliation. Having an officially-designated principal in the school has a negative effect on enrollment. We do not understand this effect, but having a principal might mean one fewer teacher, especially in smaller schools.

Interactions between province and urban-rural location—38 residence dummy variables in all (omitted from table 2.9 for the sake of brevity)—capture geographical variation and heterogeneity not captured by other included variables, including an area's ability to supply schools and the local demand for an educated labor force. With one exception we obtained positive coefficients for the urban-province variables; with two exceptions we obtained negative coefficients for the rural-province variables.[26] Although a strict urban-rural dichotomy is seldom an accurate representation of economic difference across areas, our results indicate that urban areas are associated with higher enrollment, controlling for other characteristics. There are strong geographical effects.

Two other variables reflect local economic conditions. The regression already controls for province urban and rural fixed effects, so the altitude of the village measures the specific effect of living in highland areas where schools tend to be of lower quality and are more difficult to reach. Children in highland villages are 7 percent less likely to be enrolled. Children residing in priority districts are significantly less likely to be enrolled than those in nonpriority districts.

Estimates for urban and rural groups

Thus far we have implicitly imposed the restriction that, except for a shift term, the coefficients are equal for urban and rural groups. To test this restriction, we disaggregate

25 This result contrasts with that found in Cambodia (World Bank 2005), where dropout rates fall with higher average teacher experience and schooling. The study also finds that the characteristics of teachers and school principals are highly correlated, making it difficult to separate their effects.

26 These estimates are relative to the urban province of Vientiane City.

the full sample by household residence; this yields some striking differences in the results for urban and rural groups which suggest that keeping the geographic samples together hides importance differences between them:

- Being female makes no difference in school enrollment in urban areas but is a significant disadvantage (9 percent) in rural areas.
- For urban and rural children, enrollment peaks at 9–11 years, but the increase in enrollment beyond age six is much more pronounced in rural areas (30 percent increase) than in urban areas (7 percent increase), indicating a much later age of entry in rural areas. In rural areas enrollment still rises after age 11.
- The age-gender household composition variables have much larger (and significant) coefficients for the rural sample, perhaps reflecting the larger demands of the household economy on the resources and time of household members. In rural (but not urban) areas, the greater the shares of household members of different ages relative to adult women, the less likely a child will be in school. Having preschool boys depresses enrollment equally in both urban and rural areas—by much more than the opportunity cost effect of the other age-gender composition variables. The effect of preschool girls is larger than that of preschool boys in rural areas and smaller in urban areas.
- The education of the male head of household matters more in rural areas, and the spouse's education is significant only in rural areas, but these effects are very small.
- Residence in the highlands and residence in priority districts are a significant disadvantage for children in rural areas.
- Rural residents are more than twice as likely to be enrolled if they have a complete primary school in the village that does not include multigrade classrooms, presumably because it is easier for urban residents to attend a school in a neighboring community. The school distance variables are also statistically significant in both urban and rural areas (though having different signs), but their coefficients are very small.
- School infrastructure—electricity in the school and nonleaking classrooms in particular—has a larger effect in rural areas. Examination fees have a significant negative effect in urban but not in rural areas. These effects are very small compared with the effect of having a complete primary school without multigrade classrooms.
- The share of Lao-Tai teachers has a positive and significant coefficient in urban but not in rural areas.

Estimates for boys and girls

Instead of keeping the girls and boys in one sample, we now disaggregate by sex in estimating our model. Girls' schooling is generally more precarious than that of boys,

vulnerable to the costs of schooling and to changes in the socioeconomic and demographic conditions of the household. We find significant differences in the results for the other variables:

- Boys and girls do not have the same age-enrollment profile. Boys who do not enter school by the peak ages of 9–11 are likely to enter school later, but girls not in school by ages 9–11 are unlikely to do so.
- Ethnolinguistic differences are more pronounced for girls than for boys. Compared with boys, girls from the Chine-Tibet group are much less likely to be in school than those from the Lao-Tai group.
- The household's age-gender composition has a much larger, statistically significant effect on girls: the number of children—even the number of men—relative to the number of women reduces girls' enrollment.
- Living in the highlands or a priority district has a greater (negative) effect on girls, indicating that girls' enrollment is more highly correlated with the household's living standard and the economic value of schooling in the community.
- Having a complete primary school without multigrade classrooms in the village appears to have a much greater effect on girls. Controlling for this, the time to walk to school is negatively associated with enrollment for boys but has no apparent effect for girls. Tuition has a positive effect on enrollment for girls but not for boys. If this variable is indeed measuring school quality, the results could indicate that girls' enrollment is more responsive to school quality. Examination fees have a negative effect on enrollment, but this variable is significant only for boys. School characteristics have more pronounced and statistically significant effects on girls.

Estimates for more disaggregated samples

We now disaggregate the four groups, defined by residence, gender, and ethnolinguistic affiliation, and estimate the same probit models separately for each. For the rural subgroups, Wald tests reject the hypothesis that the models for boys and for girls are equal within the Lao-Tai population ($\chi^2(55) = 234.7$, probability > $\chi^2 = 0.0000$) or within the non–Lao-Tai group ($\chi^2(55) = 322.6$, probability > $\chi^2 = 0.0000$). The tests also reject equality of models among the rural ethnolinguistic groups for girls ($\chi^2(57) = 4126.5$, probability > $\chi^2 = 0.0000$) and for boys ($\chi^2(57) = 6760.2$, probability > $\chi^2 = 0.0000$). For the urban subgroups the tests reject equality of models for boys and girls ($\chi^2(57) = 1795.8$, probability > $\chi^2 = 0.0000$). The urban sample includes too few observations to disaggregate by ethnolinguistic group. Several differences among the four groups are noteworthy:

- The household age-gender composition variables are statistically significant in the rural but not the urban sample.[27] Breaking down the rural sample

27 In the urban samples, the one exception is the share of preschool boys, which has a statistically significant coefficient for boys but not for girls and is larger for boys than for girls.

reveals that these variables are significant only for girls and that the size of the coefficients for these variables is far larger for non–Lao-Tai girls than for Lao-Tai girls. The results strongly suggest that girls' enrollment is reduced by household demands on their time—school-age girls are expected to substitute for adult women caring for younger children and performing chores. The coefficient of the share of girls ages 6–16 is somewhat smaller than the other coefficients, perhaps indicating that the presence of other school-age girls diminishes the burden on any one school-age girl in the household. School-age girls are the only subgroup for whom per capita household consumption has an insignificant effect on the probability of going to school.

- Disability has a considerably larger (and significant) negative effect on enrollment for rural Lao-Tai girls than for other subgroups.
- Having a complete primary school without multigrade classrooms in the village is the school variable that has the largest and most consistently significant effect on enrollment across the models. Disaggregating the samples reveals that among the rural groups, its effect is largest for the non–Lao-Tai, partly reflecting the greater shortage of such schools the rural non–Lao-Tai population faces. This effect is larger for girls, possibly because of a greater reluctance to send girls outside the village to attend school due to risk and cost.
- Living in a highland village has a significant negative effect on enrollment only for rural Lao-Tai girls. Having controlled separately for school supply conditions that partly measure the cost of schooling, this result suggests that girls' enrollment is also responsive to the perceived returns to education, which are likely to be low in the rural highlands.

Conclusions and policy implications

Lao PDR has made steady progress in education across its population groups in the past 40 years—enrollment rates, literacy rates, and the number of years of schooling completed have all increased. This progress has been partly a result of government education policy; economic growth alone would not have sufficed.

Improvements in educational outcomes have placed Lao PDR much closer to its neighbors, but significant challenges lie ahead. First, the number of school-age children will continue to rise, requiring continued expansion in the number of school places. The number of children ages 5–14, which reportedly rose 20 percent between 2000 and 2005, is predicted to continue to grow over the next five years, albeit at the slower pace of 7–8 percent (United Nations 2005).

Second, past progress has involved increasing the intake of school-age children rather than raising school continuation or completion rates. The challenge is to keep children in school longer and to improve instruction in classrooms so that children

acquire functional literacy and numeracy and other important skills for life and work.

Third, educational progress has not been equal across groups. Using very simple measures of academic success, urban, male, and Lao-Tai groups perform better than rural, female, and non–Lao-Tai groups, with rural, non–Lao-Tai females lagging farthest behind. This situation contrasts with that of Lao-Tai females, whose literacy and years of education have converged with those of Lao-Tai men in recent years, in both rural and urban areas.

While the education of all groups has increased, some disparities appear unyielding. Girls' schooling, particularly of poor, rural, non Lao-Tai girls, is more responsive to household and school characteristics than that of boys. Our estimates for the disaggregated population groups reveal how residence, gender, and ethnolinguistic affiliations affect school enrollment. Indeed, the underlying factors that explain why some children are enrolled and others are not differ significantly across these subgroups. The results suggest that improving school supply in rural areas is likely to benefit non–Lao-Tai more than Lao-Tai children and non–Lao-Tai girls even more than non–Lao-Tai boys. Any program to raise enrollment among the rural population will need to address the opportunity cost of attending school for girls, as such costs dampen girls' enrollment.[28] Policy interventions to increase schooling will not succeed unless they consider the specific constraints and needs facing each group.

28 For example, conditional cash transfer programs, such as Mexico's PROGRESA/Oportunidades program, which compensate parents for the opportunity cost of schooling, have been effective. In Mexico's program, which has been carefully evaluated, the level of the grants to households was set with the aim of compensating for the opportunity cost of children's school attendance (Schultz 2004; Behrman, Sengupta, and Todd 2005). The size of the grant increases with the grade attended by the child.

Annex to Chapter 2

Table 2A.1 Variable definitions and descriptive statistics for various samples of children 6–15

				Urban		Rural LaoTai			Rural non–Lao-Tai		
Variable	**National**	**Urban**	**Rural**	**Male**	**Female**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Child/household characteristics											
Child is enrolled in school	0.73	0.88	0.69	0.88	0.87	0.80	0.75	0.78	0.62	0.50	0.56
	(0.44)	(0.33)	(0.46)	(0.32)	(0.33)	(0.40)	(0.43)	(0.42)	(0.49)	(0.50)	(0.50)
Household per capita consumption (thousands of 2002/03 kip per month)	151.16	194.64	139.55	192.66	196.81	157.40	155.92	156.67	114.07	112.15	113.09
	(121.79)	(170.61)	(101.88)	(159.82)	(181.69)	(117.34)	(113.51)	(115.47)	(64.14)	(72.05)	(68.30)
Log of household per capita consumption	11.76	11.98	11.70	11.98	11.99	11.82	11.81	11.81	11.54	11.51	11.52
	(0.53)	(0.58)	(0.51)	(0.57)	(0.59)	(0.51)	(0.51)	(0.51)	(0.45)	(0.44)	(0.45)
Log household size	1.92	1.84	1.94	1.83	1.84	1.89	1.89	1.89	2.00	2.03	2.01
	(0.32)	(0.31)	(0.32)	(0.30)	(0.33)	(0.30)	(0.31)	(1.30)	(0.33)	(0.33)	(0.33)
Child is 6	0.10	0.07	0.11	0.07	0.07	0.09	0.09	0.09	0.13	0.13	0.13
	(0.30)	(0.25)	(0.31)	(0.25)	(0.25)	(0.29)	(0.29)	(0.29)	(0.33)	(0.33)	(0.33)
Child is 7	0.10	0.09	0.10	0.09	0.09	0.10	0.09	0.10	0.12	0.11	0.11
	(0.30)	(0.28)	(0.30)	(0.28)	(0.28)	(0.30)	(0.29)	(0.30)	(0.32)	(0.32)	(0.32)
Child is 8	0.11	0.10	0.12	0.10	0.09	0.11	0.11	0.11	0.12	0.13	0.13
	(0.31)	(0.29)	(0.32)	(0.30)	(0.29)	(0.31)	(0.31)	(0.31)	(0.33)	(0.33)	(0.33)
Child is 9, 10, or 11	0.29	0.28	0.30	0.28	0.27	0.30	0.30	0.30	0.30	0.28	0.29
	(0.45)	(0.45)	(0.46)	(0.45)	(0.45)	(0.46)	(0.46)	(0.46)	(0.46)	(0.45)	(0.45)
Child is 12	0.11	0.12	0.11	0.11	0.13	0.11	0.11	0.11	0.11	0.11	0.11
	(0.32)	(0.32)	(0.32)	(0.31)	(0.33)	(0.32)	(0.32)	(0.32)	(0.31)	(0.32)	(0.31)
Child is 13	0.10	0.11	0.09	0.12	0.11	0.10	0.10	0.10	0.08	0.08	0.08
	(0.30)	(0.32)	(0.29)	(0.32)	(0.31)	(0.30)	(0.30)	(0.30)	(0.28)	(0.27)	(0.27)

Variable	National	Urban	Rural	Urban		Rural LaoTai			Rural non–Lao-Tai		
				Male	Female	Male	Female	Total	Male	Female	Total
Child is 14 or 15	0.19 (0.39)	0.24 (0.43)	0.17 (0.38)	0.23 (0.42)	0.25 (0.43)	0.19 (0.39)	0.19 (0.39)	0.19 (0.39)	0.14 (0.35)	0.16 (0.36)	0.15 (0.36)
Household share of male adults 17 and older	0.22 (0.10)	0.25 (0.11)	0.22 (0.09)	0.24 (0.11)	0.25 (0.12)	0.22 (0.09)	0.23 (0.09)	0.22 (0.09)	0.20 (0.08)	0.21 (0.09)	0.20 (0.08)
Household share of female adults 17 and older	0.23 (0.10)	0.25 (0.10)	0.23 (0.09)	0.25 (0.11)	0.25 (0.10)	0.23 (0.09)	0.24 (0.09)	0.24 (0.09)	0.22 (0.09)	0.21 (0.09)	0.22 (0.09)
Household share of males 6–16	0.22 (0.15)	0.23 (0.16)	0.22 (0.15)	0.31 (0.14)	0.14 (0.13)	0.30 (0.13)	0.15 (0.13)	0.22 (0.15)	0.28 (0.12)	0.13 (0.12)	0.20 (0.14)
Household share of females 6–16	0.21 (0.14)	0.20 (0.15)	0.21 (0.14)	0.12 (0.12)	0.29 (0.13)	0.14 (0.13)	0.29 (0.12)	0.22 (0.15)	0.14 (0.12)	0.28 (0.11)	0.21 (0.14)
Household share of boys 0–6	0.06 (0.09)	0.04 (0.07)	0.07 (0.09)	0.04 (0.07)	0.04 (0.07)	0.06 (0.09)	0.05 (0.08)	0.05 (0.09)	0.08 (0.10)	0.09 (0.10)	0.09 (0.10)
Household share of girls 0–6	0.06 (0.09)	0.03 (0.07)	0.06 (0.09)	0.03 (0.07)	0.03 (0.07)	0.05 (0.08)	0.05 (0.08)	0.05 (0.08)	0.08 (0.10)	0.08 (0.10)	0.08 (0.10)
Child is first or second born	0.45 (0.50)	0.45 (0.50)	0.45 (0.50)	0.46 (0.50)	0.43 (0.50)	0.47 (0.50)	0.44 (0.50)	0.45 (0.50)	0.44 (0.50)	0.44 (0.50)	0.44 (0.50)
Birth order is missing	0.10 (0.30)	0.10 (0.30)	0.10 (0.30)	0.09 (0.28)	0.11 (0.32)	0.09 (0.28)	0.09 (0.29)	0.09 (0.29)	0.12 (0.32)	0.11 (0.31)	0.11 (0.32)
Child is female	0.50 (0.50)	0.48 (0.50)	0.50 (0.50)	0.00 (0.0)	1.00 (0.0)	0.00 (0.0)	1.00 (0.0)	0.50 (0.50)	0.00 (0.0)	1.00 (0.0)	0.51 (0.50)
Child is from Lao-Tai ethnolinguistic group	0.67 (0.47)	0.88 (0.32)	0.61 (0.49)	0.88 (0.33)	0.89 (0.31)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)
Child is from Mon-khmer ethnolinguistic group	0.21 (0.40)	0.05 (0.22)	0.25 (0.43)	0.05 (0.22)	0.05 (0.22)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.63 (0.48)	0.62 (0.48)	0.63 (0.48)
Child is from Chine-Tibet ethnolinguistic group	0.03 (0.18)	0.02 (0.16)	0.04 (0.19)	0.03 (0.18)	0.02 (0.13)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.09 (0.29)	0.09 (0.28)	0.09 (0.29)

(continued)

Table 2A.1 Variable definitions and descriptive statistics for various samples of children 6–15 (continued)

				Urban		Rural LaoTai			Rural non–Lao-Tai		
Variable	**National**	**Urban**	**Rural**	**Male**	**Female**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Child is from Hmong-Iu Mien ethnolinguistic group	0.09 (0.28)	0.04 (0.19)	0.10 (0.30)	0.04 (0.19)	0.04 (0.19)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.25 (0.43)	0.25 (0.44)	0.25 (0.43)
Child is from "other" ethnolinguistic group	0.01 (0.10)	0.00 (0.04)	0.01 (0.11)	0.00 (0.04)	0.00 (0.04)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.03 (0.16)	0.03 (0.17)	0.03 (0.17)
Household head is male	0.97 (0.18)	0.94 (0.24)	0.97 (0.16)	0.94 (0.23)	0.93 (0.25)	0.97 (0.18)	0.97 (0.17)	0.97 (0.17)	0.97 (0.16)	0.98 (0.12)	0.98 (0.14)
Age of household head	44.08 (10.36)	45.41 (10.09)	43.72 (10.40)	45.01 (9.95)	45.84 (10.23)	44.13 (10.12)	44.38 (10.11)	44.25 (10.12)	42.97 (10.86)	42.85 (10.68)	42.91 (10.77)
Child is disabled	0.01 (0.11)	0.01 (0.10)	0.01 (0.11)	0.01 (0.10)	0.01 (0.10)	0.01 (0.12)	0.01 (0.10)	0.01 (0.11)	0.01 (0.12)	0.02 (0.12)	0.01 (0.12)
Male head or spouse's years of schooling	4.67 (3.61)	6.83 (4.04)	4.11 (3.26)	6.77 (4.00)	6.89 (4.08)	4.99 (3.24)	4.94 (3.25)	4.97 (3.24)	2.72 (2.76)	2.85 (2.90)	2.79 (2.83)
Female head or spouse's years of schooling	2.90 (3.10)	4.77 (3.60)	2.40 (2.74)	4.77 (3.62)	4.77 (3.58)	3.36 (2.85)	3.20 (2.81)	3.28 (2.83)	0.98 (1.85)	1.04 (1.90)	1.01 (1.88)
School characteristics											
School has electricity	0.14 (0.34)	0.44 (0.50)	0.06 (0.24)	0.42 (0.49)	0.46 (0.50)	0.08 (0.28)	0.08 (0.27)	0.08 (0.28)	0.02 (0.14)	0.02 (0.14)	0.02 (0.14)
School is complete and does not have multigrade classrooms	0.20 (0.40)	0.32 (0.47)	0.17 (0.38)	0.33 (0.47)	0.31 (0.46)	0.22 (0.42)	0.22 (0.41)	0.22 (0.41)	0.09 (0.29)	0.09 (0.28)	0.09 (0.29)
School is not complete and has multigrade classrooms	0.37 (0.48)	0.09 (0.28)	0.44 (0.50)	0.09 (0.29)	0.08 (0.27)	0.37 (0.48)	0.38 (0.49)	0.38 (0.48)	0.55 (0.50)	0.56 (0.50)	0.56 (0.50)
School is not complete and does not have multigrade classrooms	0.34 (0.47)	0.52 (0.50)	0.29 (0.46)	0.51 (0.51)	0.52 (0.50)	0.31 (0.46)	0.31 (0.46)	0.31 (0.46)	0.27 (0.44)	0.27 (0.44)	0.27 (0.44)

Variable	National	Urban	Rural	Urban		Rural LaoTai			Rural non–Lao-Tai		
				Male	Female	Male	Female	Total	Male	Female	Total
Each student has desk	0.91 (0.28)	0.95 (0.23)	0.91 (0.29)	0.94 (0.23)	0.95 (0.22)	0.94 (0.23)	0.94 (0.24)	0.94 (0.23)	0.85 (0.36)	0.84 (0.37)	0.84 (0.36)
Share of leaky classrooms	0.27 (0.36)	0.25 (0.31)	0.27 (.37)	0.26 (0.32)	0.25 (0.30)	0.28 (0.36)	0.30 (0.36)	0.29 (0.36)	0.24 (0.38)	0.24 (0.38)	0.24 (0.38)
Share of male teachers	0.61 (0.38)	0.28 (0.27)	0.70 (0.36)	0.26 (0.27)	0.29 (0.27)	0.66 (0.34)	0.65 (0.34)	0.66 (0.34)	0.76 (0.37)	0.77 (0.36)	0.77 (0.37)
Share of Lao-Tai teachers	0.66 (0.44)	0.86 (0.30)	0.61 (0.45)	0.85 (0.30)	0.87 (0.29)	0.79 (0.37)	0.78 (0.38)	0.79 (0.37)	0.30 (0.42)	0.27 (0.40)	0.29 (0.41)
Teachers' mean years of schooling	9.83 (1.53)	10.14 (0.96)	9.75 (1.63)	10.13 (0.97)	10.14 (0.95)	9.99 (1.37)	10.04 (1.35)	10.01 (1.36)	9.25 (1.94)	9.28 (1.95)	9.26 (1.95)
School has official principal	0.60 (0.49)	0.94 (0.24)	0.51 (0.50)	0.94 (0.24)	0.94 (0.24)	0.59 (0.49)	0.60 (0.49)	0.59 (0.49)	0.38 (0.48)	0.36 (0.48)	0.37 (0.48)
Principal is male if school has principal	0.48 (0.50)	0.56 (0.50)	0.46 (0.50)	0.56 (0.50)	0.56 (0.50)	0.55 (0.50)	0.55 (0.50)	0.55 (0.50)	0.31 (0.46)	0.29 (0.45)	0.30 (0.46)
Principal is Lao-Tai if school has principal	0.42 (0.49)	0.78 (0.42)	0.33 (0.47)	0.78 (0.42)	0.78 (0.42)	0.47 (0.50)	0.47 (0.50)	0.47 (0.50)	0.11 (0.31)	0.10 (0.30)	0.10 (0.30)
Principal's years of schooling if school has principal	6.06 (5.34)	10.13 (3.52)	5.00 (5.23)	10.14 (3.52)	10.12 (3.52)	5.76 (5.24)	5.86 (5.26)	5.81 (5.25)	3.70 (4.91)	3.56 (4.88)	3.63 (4.89)
Kilometers to closest city	71.57 (65.73)	28.84 (56.84)	82.48 (63.36)	30.82 (60.81)	26.58 (51.84)	76.04 (63.81)	76.13 (62.79)	76.09 (63.30)	93.82 (61.97)	92.92 (61.92)	93.35 (61.95)
Kilometers to closest paved road	28.65 (49.00)	13.39 (62.36)	32.54 (44.13)	13.36 (62.09)	13.42 (62.67)	27.42 (45.76)	26.24 (42.89)	26.83 (44.36)	42.82 (41.96)	41.75 (41.98)	42.27 (41.97)
Kilometers to closest lower-secondary school	11.02 (21.80)	6.48 (27.75)	12.18 (19.83)	5.99 (26.61)	7.04 (28.99)	7.34 (17.89)	7.18 (16.59)	7.26 (17.26)	20.37 (20.86)	20.71 (21.28)	20.55 (21.08)
Fees are compulsory for tuition	0.51 (0.50)	0.71 (0.45)	0.46 (0.50)	0.71 (0.46)	0.72 (0.45)	0.47 (0.50)	0.45 (0.50)	0.46 (0.50)	0.46 (0.50)	0.44 (0.50)	0.45 (0.50)

(continued)

Table 2A.1 Variable definitions and descriptive statistics for various samples of children 6–15 (continued)

				Urban		Rural LaoTai			Rural non–Lao-Tai		
Variable	**National**	**Urban**	**Rural**	**Male**	**Female**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Fees are compulsory for examinations	0.50 (0.50)	0.64 (0.48)	0.47 (0.50)	0.63 (0.48)	0.65 (0.48)	0.50 (0.50)	0.53 (0.50)	0.51 (0.50)	0.39 (0.49)	0.39 (0.49)	0.39 (0.49)
Mean walking time to school (over all households in village) (minutes/day)	26.87 (39.18)	25.83 (39.77)	27.16 (39.01)	24.90 (36.82)	26.85 (42.76)	23.15 (30.95)	22.59 (30.28)	22.87 (30.62)	33.97 (48.89)	34.30 (48.98)	34.14 (48.94)
Village characteristics											
Highlands	0.25 (0.43)	0.05 (0.22)	0.30 (0.46)	0.05 (0.22)	0.05 (0.21)	0.13 (0.33)	0.13 (0.33)	0.13 (0.33)	0.57 (0.49)	0.59 (0.49)	0.58 (0.49)
Priority 1 district	0.24 (0.43)	0.14 (0.34)	0.27 (0.45)	0.14 (0.35)	0.13 (0.34)	0.18 (0.39)	0.19 (0.39)	0.19 (0.39)	0.41 (0.49)	0.41 (0.49)	0.41 (0.49)
Priority 2 district	0.12 (0.33)	0.04 (0.19)	0.14 (0.35)	0.04 (0.19)	0.03 (0.18)	0.14 (0.35)	0.14 (0.35)	0.14 (0.35)	0.14 (0.35)	0.15 (0.35)	0.15 (0.35)

Note: Birth order missing is also a measure of whether children are living in a household in which at least one parent is head of household or spouse of head.

Source: LECS3, 2002/03.

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3 *Girls in Gansu, China: Expectations and aspirations for secondary schooling*

Emily Hannum and Jennifer Adams

Gender stratification in education is declining in China, but some recent research suggests that girls' schooling is still vulnerable in poor rural areas. This chapter investigates girls' educational vulnerability in Gansu, one of China's poorest provinces. Specifically, it analyzes the Gansu Survey of Children and Families, a multisite survey that interviewed 2,000 rural children, along with their families, teachers, principals, and community leaders, in 2000 (when children were 9–12) and 2004 (when children were 13–16).

Drawing on comparative and China-specific literature on gender and exclusion, we investigate several questions. First, do gender gaps favoring boys exist in enrollment, children's educational aspirations, and parental expectations? Second, are gender gaps in enrollment, aspirations, and parental expectations worse among the poorest children and families? Third, are girls' educational outcomes more sensitive to prior performance? Fourth, do characteristics of early homeroom teachers and early classroom experiences have different effects on outcomes for girls and boys? Our findings suggest that girls do not face substantially greater access barriers to basic education than do boys in much of rural Gansu.

Girls, boys, and educational access in China: historical context

Gender inequality in China has declined over the long term (Hannum and Xie 1994; Hannum 2005; Zhou, Moen, and Tuma 1998). Recent estimates from the China Health and Nutrition Survey on 12- to 18-year-olds in five provinces show substantial improvement in enrollment rates for both girls and boys between 1989 and 2000. In 1989, 58 percent of girls and 61 percent of boys were enrolled, and the gender gap was statistically significant. In 2000, 74 percent of girls and 76 percent of boys were enrolled, and the difference was not statistically significant (Hannum and others forthcoming).

Recent sociology and economic studies have examined patterns of gender difference in access to schooling (Michelson and Parish 2000; Hannum 2003, 2005; Brown and Park 2002; Connelly and Zheng 2003; Lavely and others 1990). These studies suggest that by the 1990s gender disparities in China were concentrated in poor rural areas and among poor households, where the costs of education burden families, and children compete with siblings for educational resources (Connelly and Zheng 2003; Hannum 2003, 2005). In analyses of a multiprovince survey, Michelson and Parish (2000) show that girls living in suburban villages and villages with more nonfarm opportunities tend to stay in school longer. One study of only children in urban China finds no female disadvantage in parental spending on education, student achievement in math, and student educational aspirations (Tsui and Rich 2002).

But in rural settings evidence from the 1990s suggests that girls' schooling—more than boys' schooling—was sensitive to poverty, and that girls in poor areas need to show promise to remain in school (Brown and Park 2002; Hannum 2005). Recent evidence is mixed on whether girls remain at heightened risk in the most impoverished households. Among 12- to 18-year-olds in five provinces in the 2000 China Health and Nutrition Survey, striking disparities in enrollment are apparent by quartile on a scale of consumer items in the household—a 36 percentage point gap between average enrollment of girls in the lowest and highest quartiles. For boys the corresponding figure was 21 percentage points (Hannum and others forthcoming). The gender gap in enrollment was significant only among children in the poorest quartile. Moreover, while there was a significant years-of-schooling advantage for the wealthier 12- to 18-year-olds, there was no advantage for boys, overall or in any consumer item quartile.

A 2004 survey of more than 1,000 school-age children in a multiethnic county in Yunnan Province also paints a complex portrait of the community and family conditions that promote girls' schooling in rural areas (Davis and others 2007). Evidence from this study indicates that girls are more likely than boys of the same age to be in school, particularly after age 13. However, when children are placed in the context of their communities and households in the multivariate models, boys have a statistically significant advantage. The authors use the interaction of household and community variables with gender to explain why the social inclination to favor boys' enrollment

has been overcome in practice in this county. They find that household wealth matters more for girls than for boys. For girls a father with above-average education and past membership in the Communist Youth League facilitates enrollment, independent of household wealth. Girls and boys who live in more economically developed villages (as measured by the presence of a store or firm) are also more likely to be enrolled in school. In sum, these results suggest that when girls live with better educated fathers in wealthier households and communities, they are likely to stay in school.

Why do gender disparities exist? Social science theories

What factors explain gender differences in education, or the lack thereof, in rural China? Many of the issues commonly raised as barriers to girls' schooling in China have parallels elsewhere. In this section, we discuss theories of gender and educational attainment and consider how these theories may apply to China. We first consider theories about families and educational choices, then discuss the potential role of schools.

Families and educational choices

Both economic and cultural reasons have been used to explain why parents might choose to invest differently in sons and daughters. The most common approach to educational research in developing countries has been a family economy framework: Parents make decisions about schooling primarily or exclusively based on expectations of future returns to the household (for articulations of this view from anthropology and economics, see Mahmud and Amin 2006; Papanek 1985). In this framework parents treat education as an investment in their old-age security. Gender gaps (or the lack thereof) depend on whether social institutions create incentives for decisions that, while economically rational, discriminate against girls.

In this framework parental perceptions that girls are unlikely to succeed in the labor market can drive gender gaps. Some scholars have argued that reforms in China during the market transition of the 1980s and 1990s caused a "feminization of agriculture." Rural women were increasingly concentrated in agricultural occupations while men were more likely to have access to higher-paying rural industrial jobs, where educational credentials carried greater weight (Summerfield 1994; Wolf 1985). This lowered incentives to educate girls beyond a certain level. Michelson and Parish (2000) speculate that, because women are perceived as less able to contribute to family income (due to their concentration in farm work), families may not feel compelled to educate girls to the same level as boys.

That parents perceive worse employment prospects for rural girls than for their male counterparts is increasingly debatable, given the dramatic rise in migration to urban areas by young women and men seeking informal work. Li and Tsang (2005) suggest that the implications of migration for girls' education are mixed. Many

privately owned urban enterprises in the manufacturing and service sectors in coastal areas, as well as smaller factories and enterprises in townships and villages, have hired young female workers with limited education in recent years. However, both employers and young women often perceive this type of employment as temporary (before marriage). The possibility of labor migration may increase the perceived opportunity cost of educating daughters. At the same time, it also shifts incentives for parents, as girls' potential wages before marriage give rural households a return from their daughters.

A second important reason why parents may face rational incentives to give priority to sons' education occurs even in the absence of labor market segmentation—when marriage norms dictate that parents live with sons, making sons the primary source of old-age support. This situation is common in rural Asia (Mahmud and Amin 2006). In rural China girls typically marry out of households, while boys remain with their families (Li and Tsang 2005). As long as the tradition of coresidence with sons holds, parents face strong incentives to invest in sons as long-term insurance. Poverty may exacerbate incentives to invest differently in boys and girls. Research in a rural county in Yunnan Province indicates that expectations of support from sons are more pronounced among mothers in poorer, more remote rural areas (Li and Lavely 2003).

Of course, parents in developing country settings are not motivated only by economic considerations. In rural Bangladesh Mahmud and Amin (2006) argue that marriage, more than a job, is the desired outcome of girls' education—parents are increasingly willing to invest in girls' education to secure a good marriage, despite the lack of direct economic returns to the household (Mahmud and Amin 2006; see also chapter 7 of this volume). Rothchild's (2006) fieldwork among families and teachers in a rural Nepalese village reveals that parents often speak of girls' education "in terms of their presumed current and future roles as daughters, wives, others, and daughters-in-law, rather than as a source of individual opportunity and empowerment." (Rothchild 2006, 106). In China, Li and Tsang (2005) suggest that, because a good marriage is more important than a good job for rural girls' long-term welfare, some parents may think more about maximizing the chances of a good marriage than about investing in long-term career options. These examples suggest the unsurprising conclusion that parental educational decisions go beyond a simple framework of family survival to include gender-specific considerations about how best to aid the child's life.

These examples also suggest that cultural norms—not just economic incentives—lead to different socialization of boys and girls. Research on determinants of educational attainment in the United States, without a prevalent norm of children as the main source of old-age support, views parental socialization as critical. One of the most widely cited models in sociology, the Wisconsin model of status attainment, emphasizes the crucial role of parents as socializing agents (Haller and Portes 1973). While tests of the Wisconsin model initially focused on males, later research traced

the role of parental and child aspirations for girls as well as boys (Wilson, Peterson, and Wilson 1993).

In this framework, parents' differing views about boys and girls and their job prospects color aspirations for and investments in boys and girls directly—not because parents expect more support from sons than daughters. One explanation for gender gaps is that culture leads directly to parents' discriminatory attitudes and practices, regardless of rationality. Investment and socialization decisions made by parents, and even the choices of children, are affected by cultural perspectives about essential gender abilities, rights, and roles. These cultural perspectives become reified in different educational choices.

This notion has been applied in educational studies in rural or isolated communities in the United States, where traditional family structures persist. Research in rural Appalachia the 1970s and 1980s suggests that the gender division of labor among adults shaped parental socialization and aspirations for children from an early age, leading to worse educational and occupational trajectories for girls (Hennon and Photiadis 1979; Wilson, Peterson, and Wilson 1993).

In rural China a traditional culture of son preference may still color parental decisions about the value of girls and their worthiness for educational investment. Ethnographic and demographic studies suggest that families retain a strong preference for sons (Banister 2004; Croll 2000). One recent study ties son preference in mothers directly to traditional culture. Analyzing a 1994 survey of women in a rural county in southwest China who bore children between 1991 and 1994, Li and Lavely (2003) show that women in households that practice traditional ancestor worship express a stronger preference for sons. However, a preference for sons—undeniably still present—does not necessarily mean a strong preference for educating sons more than daughters. Recent studies attesting to son preference have used mainly demographic data, such as increasing gender ratios at birth and excess female mortality in early childhood (Banister 2004; Croll 2000). The daughter discrimination evident in demographic data is not mirrored in recent national education data.

To close this discussion of family choices and gender inequality in education, we highlight three important points. First, the economic and cultural sources of daughter discrimination are difficult to separate. Societies where parents find discrimination against girls economically rational tend to be societies with a culture of traditional gender norms. Culture plays a role even in the economic explanations for discrimination against girls. In theory a distinction can be made about whether parents choose to invest differently in boys and girls primarily because of the incentives they face or because they hold discriminatory attitudes. In practice parents may not know whether economic or normative forces affect their choices. Second, at least some parents in rural Asian settings, including rural China, still face both cultural and economic imperatives to invest in sons more than daughters. Whether parents continue to act on these old imperatives in their educational decisions in rural China is an open question.

Third, in a context where most children now have access to basic-level schooling (as in China), cultural biases or economic incentives may play out only (or primarily) among the poor, for whom economic circumstances dictate choices for children. Yet some of the most recent evidence calls into question the scope of girls' disadvantage even among the poor.

The role of schools

Children's experiences at school have been little studied in China, or in developing societies more broadly, as potential influences on persistence in school. Where the direct and opportunity costs of education are high and school access is not universal, a focus on the important role of parents in decisions about schooling is warranted. Yet interpreting schooling outcomes solely as the product of parental cost-benefit calculations may not tell the whole story. Studies in China, Ghana, and Kenya indicate that substantial numbers of school-leavers report disaffection or boredom with schooling as a significant contributor to their decision to leave (Blunch 2006; Buchmann 2000; Hannum and Adams 2006).

What experiences might lead children to leave? One potential factor is poor school performance. Performance may be linked to subsequent attainment directly, through high-stakes exams, or indirectly, by influencing parental decisions about investing in children's continued education or children's willingness to stay in school. Studies in rural China suggest that showing promise early may be particularly important for rural girls (Brown and Park 2002; Zhang, Kao, and Hannum 2007).

The environment at school may also matter for enrollment decisions. Lloyd, Mensch, and their colleagues consider the environment at school as a predictor of subsequent enrollment in Egypt and Kenya (Lloyd and Mensch 2000; Lloyd and others 2003; Mensch and Lloyd 1998; Mensch and others 2001). In Egypt their results show that the school environment is associated with the probability of school exit and grade attainment. The elements of school environment that matter include measures of school quality, such as time to learn, material resources, and teacher quality. Also important are aspects of school and classroom dynamics, particularly teacher treatment and attitudes (Lloyd and others 2003).

Lloyd and Mensch show that in Kenya girls' retention is linked to teacher gender attitudes, gender gaps in support given to students, and disciplinary climates permitting the harassment of girls (Lloyd and Mensch 2000). Reflecting on results in both Egypt and Kenya, the authors conclude that school attributes that matter for educational outcomes are context specific and may work differently for girls and boys (Lloyd and others 2003).

Little attention has been paid to how school experiences may matter for continued enrollment—particularly for girls. Findings from existing research suggest that this is a significant gap in our understanding of determinants of educational attainment in developing societies.

Does gender still matter for access to basic education?

To assess the effect gender has on access to basic education, we examine data from Gansu Province, the poorest province in China's poorest region (box 3.1). Drawing on comparative and China-specific research, we pose four sets of questions about the nature and sources of gender disparities in schooling:

1. Do gender gaps favoring boys exist in enrollment, children's aspirations, and parental expectations?
2. Are gender gaps in enrollment, child aspirations, and parental expectations concentrated in the poorest children and families? That is, do interactions with poverty exacerbate gender gaps in outcomes among the poorest children?
3. Are the educational outcomes of enrollment, child aspirations, and parental expectations more sensitive to prior performance for girls? That is, do girls need to show promise early to stay in school—to want to stay and to maintain support for staying from significant others?
4. Do teacher characteristics and classroom experiences affect enrollment and aspirations for girls and boys differently? Research in other countries suggests that girls and boys may have different sensitivities to negative aspects of school climate, such as disciplinary problems and teacher support. Are there gender interactions between variables measuring children's relationships with teachers and classroom disciplinary problems, on the one hand, and subsequent enrollment or the desire to stay in school, on the other? Do teacher background and education have different effects on boys and girls?

Measuring gender disparities and their sources

Our analysis includes education indicators, child aspirations, child and family background characteristics, family wealth, child age, child school performance, teacher characteristics, the teacher-child relationship, teacher expectations for the child, and the classroom environment (table 3.1). First, we examine whether the children enrolled in school in 2000 remained enrolled in school in 2004. We find that 87 percent of the students enrolled in 2000 were also enrolled in 2004.

Next we explore child aspirations. The aspirations measure specifies the highest level of schooling the child wants to complete (in years). The average desired schooling for the children in our sample who were enrolled in school in 2004 was high—14.4 years.

Because previous research suggests that parental attitudes play an important role in shaping both children's educational aspirations and schooling decisions, we

Box 3.1. The Gansu survey of children and families

Our analyses draw on a unique data set, the Gansu Survey of Children and Families. This multilevel survey was designed to increase understanding of rural children's schooling and welfare in the context of poverty. In China, poverty remains heavily concentrated in rural areas, and rural poverty is much more prevalent in the interior and western provinces than in the coastal provinces (Wang 2004). Gansu Province is one of China's poorest. In 2001 Gansu was ranked second-to-last among provinces in per capita GDP, at only 55 percent of the national average (Woo and Bao 2003). By China's official estimates, the poverty rate in Gansu was three times the national average, and Gansu was home to 6.6 percent of China's poor rural population (Wang 2004). Gansu stretches across parts of the Gobi desert, mountainous and hilly areas, and vast grasslands. Much of Gansu is mountainous or highland plateau, with an elevation of more than 1,000 meters. In 2000 Gansu Province had a population of 25.6 million, with 76 percent residing in rural areas (UNESCAP 2005).

Rural residents in Gansu work predominantly in subsistence farming or animal husbandry, earning an average annual per capita income only 63 percent of the national average in 2000 (Gansu Socioeconomic Development Report 2001). Gansu's rural poverty and illiteracy rates are among the highest in China (UNESCAP 2005; World Bank 2000).

Conducted in the summers of 2000 and 2004, the Gansu Survey of Children and Families surveyed 2,000 children 9 to 12 years old (in wave 1) in rural areas of 20 counties in Gansu Province, along with their families, teachers, principals, and village leaders (see map 1). The sample was drawn using a multistage, clustered design with random selection procedures employed at each stage (county, township, village, and child). At the final stage, children were sampled from birth records for the full cohort of 9- to 12-year-old children in 100 selected villages. The sample included only rural villages, not cities or townships. In China the urban-rural designation is official, clearly defined, and consequential for access to services. Drawing a sample of rural villages was therefore clear-cut. Our sample is broadly representative of rural Gansu in incomes: the per capita incomes of 46 percent of the households in our sample (920 households) were above the provincial average. The remaining 54 percent of households (1,080 households) had incomes below the provincial average (Gansu Statistics Bureau n.d.).

Map 1. Gansu Province, sample counties labeled

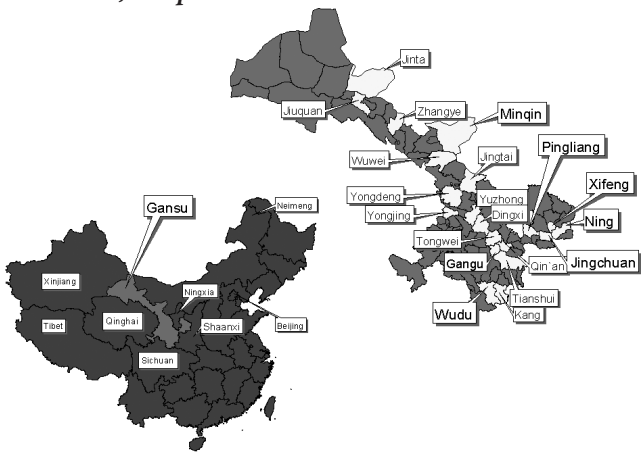

Table 3.1. Descriptive statistics for variables used in the analysis

Variable	Mean	Standard deviation	Number of observations
Educational indicators 2004			
Percentage of students enrolled in 2000 still enrolled	86.70	0.34	1,918
Child's aspirations for educational attainment (years of schooling)	14.40	2.43	1,761
Mother's expectations for child's educational attainment (years of schooling)	13.11	2.93	1,668
Father's expectations for child's educational attainment (years of schooling)	12.86	3.16	1,749
Child characteristics, 2000			
Gender (0 = female, 1 = male)	0.53	0.50	1,918
Log of family wealth (log of yuan)	9.18	0.94	1,918
Child's age in years (2004)			1,918
13	0.19	0.39	
14	0.29	0.46	
15	0.28	0.45	
16	0.22	0.42	
Prior mathematics grade	73.89	14.65	1,880
Parental characteristics, 2000			
Mother's education (years of schooling)	4.12	3.49	1,916
Father's education (years of schooling)	6.95	3.52	1,917
Mother's expectations for child's educational attainment (years of schooling)	11.99	2.88	1,862
Child reports of teacher closeness, 2000			
Teacher pays attention to me			1,918
Totally disagree	0.10	0.30	
Disagree	0.24	0.43	
Agree	0.39	0.49	
Totally agree	0.26	0.44	
Teacher likes me			1,918
Totally disagree	0.05	0.22	
Disagree	0.15	0.35	
Agree	0.49	0.50	
Totally agree	0.31	0.46	

(continued)

Table 3.1. Descriptive statistics for variables used in the analysis (continued)

Variable	Mean	Standard deviation	Number of observations
Classroom teacher characteristics, 2000			
Teacher's gender (0 = female, 1 = male)	0.65	0.48	1,884
Local teacher (native to the village) (0 = no, 1 = yes)	0.39	0.49	1,918
Teacher's education (0 = not a university graduate, 1 = university graduate)	0.23	0.43	1,918
Teacher's expectations for child's educational attainment (years of schooling)	11.13	2.92	1,898
Classroom environment, 2000			
Disruptive environment scale 2000 (1–3)	1.89	0.45	1,822

Source: Gansu Survey of Children and Families (2000, 2004).

investigate whether there are differences by child's gender in parental expectations (for mothers and fathers) for the highest level of schooling they think the child can complete (in years).[1] In 2000 our sample mean for mothers' expectations was 13.1 years, while the mean for fathers' expectations was 12.9 years. We also consider child and family background characteristics. We include child gender to investigate whether there are differences between girls and boys in the educational indicators described above.

We include family wealth because prior research connects financial resources in the home to schooling in rural China (Brown and Park 2002; Bray, Ding, and Huang 2004). The sample average value for the log of family wealth is 9.18, with a standard deviation of 0.94. We also use mothers' and fathers' education to control for human capital in the home. We use mothers' expectations in 2000 to examine whether these attitudes condition subsequent student enrollment. We also include a categorical control variable for child's age to allow for potential nonlinearity.

Because school performance may link directly and indirectly to subsequent educational outcomes, we also control for prior grades in mathematics. This variable is included because research on rural China suggests that academic performance is associated with school retention (Brown and Park 2002).

While teacher effects on student outcomes have been the subject of controversy in the academic literature, previous research indicates that some teacher characteristics matter for student achievement (Goldhaber and Brewer 1999; Ferguson and Ladd 1996). On average, students with better teachers score higher on standardized

1 This item measures parental expectations for schooling. A different question asked them about wishes or aspirations for schooling for their child.

tests. Rivkin and others (1998) conclude that teacher quality is the most important determinant of school quality.

While researchers generally agree that teachers matter, empirical findings have not clearly identified the specific characteristics that affect student achievement. In our analyses, we investigate teacher characteristics that may be important in rural China.

We also describe characteristics of the child's classroom teacher. In our sample 39 percent of students have a classroom teacher native to the village. Having a native teacher may promote a positive student-teacher relationship in the classroom, or it may be a proxy for stability.

Because previous research suggests that teacher education sometimes matters (Murnane 1975), we control for teacher education (completion of university). In addition, we include the classroom teacher's gender in the analyses. In our sample 65 percent of students are taught by male teachers.

Research by Lloyd and others (2003) suggests that teacher treatment and attitudes may matter for subsequent enrollment. We include two direct measures of the child-teacher relationship from the child's perspective: teacher attention and teacher friendliness. Both measures are categorical variables that record the child's perception of whether "the teacher pays attention to me" and "the teacher likes me." Many students do not feel that they have a positive relationship with their teachers: 34 percent disagree with the statement "the teacher pays attention to me," while 20 percent disagree with the statement "the teacher likes me." We also examine whether teacher expectations—the number of years of schooling that teachers anticipate children will complete—matter for subsequent outcomes.

Research in diverse settings has linked school environment to many educational outcomes, including academic engagement, achievement, and student behavior (Astor and others 1999; Noguera 1995; Goyette and Conchas 2002; Parcel and Dufur 2001). To measure this effect, a classroom environment scale, ranging from 1 to 3, was constructed by summing student responses to five questions on cheating, teasing, fighting, and general disruption in their classroom environment and dividing by the number of questions. For each of the questions, respondents could answer 1 (never), 2 (sometimes), and 3 (often). The internal consistency of the scale is satisfactory (Cronbach's alpha = 0.71) (see annex for details). We focus on disruption because recent work highlights classroom disruption as a key impediment to learning (Baker and LeTendre 2005). There have been no attempts to quantify classroom climate in the literature on schooling in China.

How different are girls' and boys' outcomes in rural Gansu?

In 2000 almost all children surveyed were enrolled in school; by 2004 about 87 percent were still enrolled (84 percent of girls and 89 percent of boys). Among children enrolled in school, a slightly greater percentage of boys aspire to complete postsecondary

Table 3.2. Educational indicators in Gansu Province, China by gender, 2000 and 2004

Item	Female (percent)	Male (percent)	χ^2
Enrollment rate, 2000			
Enrolled	98.1	99.5	10.54***
Not enrolled	1.9	0.5	
Enrollment rate, 2004			
Enrolled	84.4	88.8	7.85***
Not enrolled	15.6	11.2	
Child's aspirations for educational attainment, 2004 (years of schooling)			
6 years	2.5	1.0	15.87***
9 years	6.0	7.2	
11 years	4.3	2.5	
12 years	15.0	14.9	
14 years	8.2	9.4	
16 years	64.0	65.4	
Mother's expectations of child's educational attainment, 2004 (years of schooling)			
6 years	0.8	0.6	11.74**
9 years	18.4	12.8	
12 years	39.9	40.0	
16 years	40.1	45.6	
Father's expectations of child's educational attainment, 2004 (years of schooling)			
6 years	3.7	1.5	25.54***
9 years	18.6	17.6	
12 years	39.8	33.6	
16 years	36.6	46.6	

** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Source: Gansu Survey of Children and Families (2000, 2004).

schooling. Although these gender differences in aspirations are statistically significant, they are very absolutely small (table 3.2).

Mothers have higher expectations of boys: about 46 percent of mothers of boys and 40 percent of mothers of girls expect their children to achieve higher education (16 years), while about 18 percent of mothers of girls and 13 percent of mothers of boys expect their children to stop schooling after middle school. Fathers also have higher educational expectations for boys, with the percentage of fathers who expect their sons to

Table 3.3. Educational indicators in Gansu Province, China, by gender and wealth quintiles, 2004

	Poorest quintile family wealth			Top four quintiles of family wealth		
Item	Female (percent)	Male (percent)	χ^2	Female (percent)	Male (percent)	χ^2
Enrollment rate	81.0	83.7	0.47	85.3	89.8	7.66***
Number enrolled	158	159		597	743	
Number not enrolled	37	31		103	84	
Child's aspirations for educational attainment (years of schooling)						
6 years	6.3	1.8	11.05*	1.4	0.4	14.32**
9 years	5.7	11.8		6.2	6.2	
11 years	1.7	3.5		5.1	2.3	
12 years	17.6	14.7		14.4	4.9	
14 years	10.8	7.1		7.4	9.9	
16 years	58.0	61.2		65.6	66.3	
Mother's expectations for child's educational attainment (years of schooling)						
6 years	1.9	1.3	9.60**	0.5	0.5	4.93
9 years	30.3	15.9		15.5	12.3	
12 years	40.0	51.7		40.2	38.1	
16 years	27.8	31.1		43.8	49.1	
Father's expectations for child's educational attainment (years of schooling)						
6 years	9.1	3.6	7.40*	2.4	1.0	15.15***
9 years	24.3	23.2		17.4	16.6	
12 years	43.0	39.3		39.6	32.6	
16 years	23.6	33.9		40.6	49.8	

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Source: Gansu Survey of Children and Families (2004).

complete university 10 percentage points higher than the percentage who expect their daughters to do so. So, on our first research question, gender gaps in enrollment are modest and gaps in aspirations small. Gender gaps in parental expectations are more pronounced, but parents hold high educational expectations for both girls and boys.

We next consider whether gender disparities are more pronounced under conditions of extreme poverty. In 2004 about 84 percent of the poorest boys and 90 percent of all other boys in the survey were enrolled in school (table 3.3). About 81 percent of the poorest girls and 85 percent of all other girls were enrolled. Poor girls are the most

disadvantaged. However, contrary to expectations, the gender gap in enrollment is not worse among the poorest children.[2] For children's aspirations, gender differences are marginally significant for the poorest children and conventionally significant for the larger sample of other children. Only for the poorest do mothers' expectations vary significantly by child gender. Fathers' expectations differ by gender of child marginally among the poorest and significantly among other groups. On our second research question, our bivariate findings suggest that the story is mixed regarding whether girls' disadvantage is more pronounced among the poorest children. For maternal expectations the answer appears to be yes, but our findings are inconsistent for other outcomes.

What factors affect girls' and boys' educational outcomes?

To address the remaining research questions and confirm the descriptive findings in a multivariate context, we turn to models of student outcomes in 2004, using year-2000 predictors. First, we conduct multivariate analyses of enrollment. Next, for those enrolled, we model children's aspirations and parents' expectations in 2004. All models include child's age, as reported in 2004, and gender. We also include a series of predictors from 2000. All models include measures of logged family wealth, mother's educational background (or father's educational background, in the case of models of father's expectations), child's math performance, and measures of the homeroom teacher's gender, educational background, local status, and educational expectations for the child (expected years of schooling). In models of aspirations and enrollment, we also include reports on whether children think that the teacher likes and pays attention to them, as well as the teacher's and mother's educational plans (expected years of schooling) for the child. In models of enrollment, we also add the scale of disciplinary disruptions in the classroom. Across outcomes, we show results with and without fixed effects for villages. For each outcome, we investigate research questions 2–4 by looking for gender interactions with wealth, prior performance, and teacher and classroom characteristics.

Enrollment. We predict enrollment using a series of variables measuring the child's age and gender; logged household wealth; the mother's educational attainment and educational expectations for the child; the teacher's educational background, local versus nonlocal status, gender, and educational expectations for the child; the child-reported relationship with the teacher and the child-reported classroom environment; and, in a final specification, village fixed effects (table 3.4). We then test for gender interactions with wealth, prior performance (measured as math performance), classroom climate, and teacher characteristics.

A standard main effects model, model 1 includes only background characteristics of the child (including prior performance) and teacher. This model shows that being younger, wealthier, male, from a family with a more educated mother, and better at math are associated with higher enrollment. This model confirms a significant

2 This result is consistent with the findings for Bangladesh presented in chapter 7.

enrollment disadvantage for girls: the odds ratio associated with being male is 1.42, meaning that boys are 42 percent more likely than girls to be enrolled in school, other things equal. None of the teacher characteristics is significant in this specification.

Model 2 is a different main effects specification that adds measures of attitudes and expectations not typically included in economic models of school outcomes (though some of these concepts are common in sociological models of status attainment). These additions set up the model for gender interactions that test our hypotheses. This model shows that older children, poorer children, and children with less educated mothers are less likely to be in school. Having a mother or a teacher with higher expectations in 2000 also significantly predicts enrollment. Net of these factors, there are marginally significant positive effects for being male and scoring better in math.

To test our second research question, model 3 adds to model 2 an interaction between gender and logged wealth. This addition significantly improves model fit ($\Delta - 2LL = 3.872$, d.f. = 1, $p < .05$), and shows that it is consistent with the descriptive tables but counter to our prior expectations: boys' enrollment is more sensitive than girls' enrollment to wealth.

Models 4–6 test for gender interactions with prior performance, classroom climate, and teacher factors—none of these significantly improves model fit. In other words, our evidence suggests that these factors do not have different effects on girls' and boys' subsequent enrollment.[3] Model 7 adds village fixed effects to the preferred specification (model 3, the wealth interaction model). However, because there are villages where all children are enrolled, the estimation sample includes only the 84 villages with variability in enrollment. Re-estimating model 3 using this estimation sample reveals that the addition of villages significantly improves model fit ($\Delta - 2LL = 116.99$, d.f. = 82, $p < .01$).

Incorporating village fixed effects does not change the story from model 3, except that the wealth and gender interaction becomes only marginally significant. The only changes in model 7 are that classroom climate is a significant predictor of enrollment in villages with variability in enrollment, and math performance changes from marginally to conventionally significant.

Child aspirations. For the remainder of the outcomes considered here, we face a selection problem: observations are present only for children who remained enrolled. We bear this problem in mind in interpreting our results.

Model 1, the standard main effects model, shows that for enrolled children in 2004, math performance and mothers' education are the significant predictors (table 3.5). Logged wealth is only marginally significant. There is no advantage for boys.

3 Other analyses of the Gansu data using different specifications and separating the sample by sex show that prior math achievement is significant in models of persistence only in the girls' subsample, though effect magnitudes are similar in the girl and boy samples (Zhang, Kao, and Hannum 2007). That analysis also showed a number of other factors that mattered only in one of the two sex-specific subsamples.

Table 3.4. Estimates of enrollment in Gansu Province, 2004

Independent variable	Model 1 Standard main effects	Model 2 Main effects	Model 3 Poverty	Model 4 Show promise	Model 5 Class-room environ-ment	Model 6 Teacher–child relation-ship	Model 7 Village fixed effects
Constant	–0.12 (0.87)	–0.39 (1.06)	0.91 (1.26)	–0.75 (1.11)	–0.50 (1.11)	–0.52 (1.15)	–1.12 (1.63)
Age 14	–0.84** (0.37)	–0.85** (0.37)	–0.83* (0.37)	–0.86** (0.37)	–0.84** (0.37)	–0.84** (0.38)	–0.86** (0.40)
Age 15	–1.98*** (0.35)	–1.96*** (0.35)	–1.96** (0.35)	–1.96*** (0.35)	–1.95*** (0.35)	–1.97*** (0.35)	–2.13*** (0.38)
Age 16	–2.56*** (0.34)	–2.63*** (0.35)	–2.64** (0.35)	–2.64*** (0.35)	–2.63*** (0.35)	–2.65*** (0.35)	–2.97*** (0.38)
Child is male	0.35** (0.15)	0.29 (0.16	–2.60* (1.48)	1.07 (0.74)	0.51 (0.69)	0.45 (0.99)	–2.56 (1.67)
Log wealth	0.23*** (0.08)	0.19** (0.09	0.04 (0.12)	0.19** (0.09)	0.19** (0.09)	0.20** (0.09)	0.08 (0.14)
Mother's years of schooling	0.06** (0.02)	0.05* (0.02)	0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.03 (0.03)
Mother's expectations for child's schooling, 2000		0.09** (0.03	0.09*** (0.03)	0.09*** (0.03)	0.09*** (0.03)	0.09*** (0.03)	0.12*** (0.04)
Child's math achievement, 2000	0.02*** (0.01)	0.01* (0.01	0.01* (0.01)	0.02** (0.01)	0.01* (0.01)	0.01* (0.01)	0.02** (0.01)
Classroom environment, 2000		–0.29 (0.18	–0.28 (0.18)	–0.28 (0.18)	–0.23 (0.24)	–0.30* (0.18)	–0.56** (0.22)
Teacher is male	–0.08 (0.17)	–0.07 (0.17)	–0.07 (0.17)	–0.07 (0.17)	–0.06 (0.17)	–0.10 (0.24)	–0.15 (0.23)
Teacher is local	–0.27* (0.16)	–0.26 (0.17	–0.27 (0.17)	–0.26 (0.17)	–0.26 (0.17)	–0.20 (0.22)	–0.13 (0.23)
Teacher's expectations for child's schooling, 2000		0.07** (0.03)	0.08** (0.03)	0.08** (0.03)	0.07** (0.03)	0.06 (0.04)	0.11*** (0.04)
Teacher is university graduate	–0.28 (0.18)	–0.29 (0.18)	–0.29 (0.18)	–0.28 (0.18)	–0.29 (0.18)	–0.29 (0.18)	–0.38* (0.23)
Teacher likes me							
Disagree		0.32 (0.37)	0.36 (0.37)	0.30 (0.37)	0.32 (0.37)	0.06 (0.50)	0.30 (0.44)
Agree		0.26 (0.333)	0.29 (0.334)	0.26 (0.33)	0.26 (0.33)	0.43 (0.45)	0.24 (0.40)
Totally agree		0.20 (0.35)	0.21 (0.35)	0.20 (0.35)	0.21 (0.35)	0.36 (0.46)	0.31 (0.41)
Teacher pays attention to me							
Disagree		–0.01 (0.31)	–0.01 (0.31)	–0.03 (0.31)	–0.01 (0.30)	0.23 (0.40)	0.13 (0.34)

Independent variable	Model 1 Standard main effects	Model 2 Main effects	Model 3 Poverty	Model 4 Show promise	Model 5 Class-room environ-ment	Model 6 Teacher–child relation-ship	Model 7 Village fixed effects
Agree		–0.26 (0.28)	–0.25 (0.28)	–0.28 (0.28)	–0.26 (0.28)	–0.11 (0.38)	–0.28 (0.32)
Totally agree		0.04 (0.30)	0.05 (0.30)	0.02 (0.30)	0.05 (0.30)	–0.01 (0.40)	0.07 (0.35)
Log wealth × child's gender			0.32** (0.16)				0.33* (0.18)
Math × child's gender				–0.01 (0.01)			
Class environment × child's gender					–0.11 (0.35)		
Teacher likes me							
Disagree × child's gender						0.60 (0.77)	
Agree × child's gender						–0.44 (0.68)	
Totally agree × child's gender						–0.42 (0.70)	
Teacher pays attention to me							
Disagree × child's gender						–0.59 (0.63)	
Agree × child's gender						–0.35 (0.58)	
Totally agree × child's gender						0.07 (0.62)	
Teacher's expectations × child's gender						0.03 (0.05)	
Teacher gender × child's gender						0.08 (0.35)	
Teacher local × child's gender						–0.08 (0.33)	
Village fixed effects	No	No	No	No	No	No	Yes**
Neg 2 log likelihood	1,178.9	1,151.1	1,147.2	1,149.9	1,151.0	1,143.2	956.0
Pseudo R^2	.13	.15	.16	.16	.15	.16	.25

** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Number of observations for all models except model 7 = 1,817. Number of observations for model 7 = 1,509. Figures in parentheses are standard errors.

Source: Gansu Survey of Children and Families (2000, 2004).

Table 3.5. Estimates of educational aspirations in Gansu Province, 2004

Independent variable	Model 1 Standard main effects	Model 2 Main effects	Model 3 Poverty	Model 4 Show promise	Model 5 Teacher-child relationship	Model 6 Preferred model	Model 7 Village fixed effects
Constant	11.07*** (0.67)	10.94*** (0.75)	10.99*** (0.98)	10.71*** (0.82)	11.10*** (0.85)	11.30*** (0.75)	11.21*** (0.81)
Age 14	0.11 (0.16)	0.10 (0.16)	0.10 (0.16)	0.10 (0.16)	0.10 (0.16)	0.10 (0.16)	0.09 (0.16)
Age 15	0.07 (0.17)	0.07 (0.17)	0.07 (0.17)	0.07 (0.17)	0.09 (0.17)	0.08 (0.17)	–0.03 (0.17)
Age 16	0.07 (0.18)	0.03 (0.18)	0.03 (0.18)	0.02 (0.18)	0.04 (0.18)	0.03 (0.18)	0.01 (0.19)
Child is male	0.16 (0.12)	0.12 (0.12)	0.03 (1.17)	0.54 (0.62)	0.08 (0.75)	–0.38* (0.20)	–0.32 (0.20)
Log wealth	0.13* (0.07)	0.10 (0.07)	0.10 (0.10)	0.10 (0.07)	0.09 (0.07)	0.09 (0.07)	0.09 (0.08)
Mother's years of schooling	0.05*** (0.02)	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)	0.04** (0.02)	0.01 (0.02)
Mother's expectations for child's schooling, 2000		0.05** (0.02)	0.05** (0.02)	0.05** (0.02)	0.04* (0.02)	0.04** (0.02)	0.04* (0.02)
Child's math achievement, 2000	0.02*** (0.00)	0.02*** (0.01)	0.02*** (0.01)	0.02*** (0.01)	0.02*** (0.01)	0.02*** (0.01)	0.02*** (0.01)
Teacher is male	0.23* (0.13)	0.22* (0.13)	0.22* (0.13)	0.22* (0.13)	–0.19 (0.19)	–0.20 (0.18)	–0.01 (0.20)
Teacher is local	–0.05 (0.13)	–0.02 (0.13)	–0.02 (0.13)	–0.02 (0.13)	–0.11 (0.18)	–0.02 (0.13)	–0.06 (0.15)
Teacher's expectations for child's schooling, 2000		0.06*** (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.09*** (0.03)	0.06*** (0.02)	0.07*** (0.03)
Teacher is university graduate	0.11 (0.15)	0.12 (0.15)	0.12 (0.15)	0.11 (0.15)	0.13 (0.20)	0.12 (0.15)	0.18 (0.16)
Teacher likes me							
Disagree		0.19 (0.29)	0.19 (0.29)	0.19 (0.29)	0.03 (0.45)	0.19 (0.29)	0.21 (0.29)
Agree		–0.04 (0.26)	–0.04 (0.26)	–0.04 (0.26)	–0.30 (0.41)	–0.06 (0.26)	0.00 (0.26)
Totally agree		–0.07 (0.27)	–0.07 (0.27)	–0.08 (0.27)	–0.17 (0.41)	–0.09 (0.27)	–0.05 (0.27)
Teacher pays attention to me							
Disagree		–0.30 (0.22)	–0.30 (0.22)	–0.30 (0.22)	–0.34 (0.32)	–0.29 (0.22)	–0.19 (0.22)
Agree		–0.26 (0.21)	–0.26 (0.21)	–0.26 (0.21)	–0.06 (0.30)	–0.25 (0.21)	–0.18 (0.21)

Independent variable	Model 1 Standard main effects	Model 2 Main effects	Model 3 Poverty	Model 4 Show promise	Model 5 Teacher-child relationship	Model 6 Preferred model	Model 7 Village fixed effects
Totally agree		–0.11 (0.22)	–0.11 (0.22)	–0.12 (0.22)	0.09 (0.32)	–0.12 (0.22)	–0.15 (0.22)
Log wealth × child's gender			0.01 (0.13)				
Math × child's gender				–0.01 (0.01)			
Teacher gender × child's gender					0.77*** (0.25)	0.77*** (0.24)	0.66*** (0.24)
Teacher local × child's gender					0.17 (0.25)		
Teacher's expectations × child's gender					–0.05 (0.04)		
Teacher's education × child's gender					–0.01 (0.28)		
Teacher likes me							
Disagree × child's gender					0.29 (0.59)		
Agree × child's gender					0.43 (0.54)		
Totally agree × child's gender					0.10 (0.55)		
Teacher pays attention to me							
Disagree × child's gender					0.08 (0.44)		
Agree × child's gender					–0.38 (0.41)		
Totally agree × child's gender					–0.39 (0.43)		
Village fixed effects	No	No	No	No	No	No	Yes***
R^2	.04	.05	.05	.05	.06	.05	.18

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Number of observations for all models = 1,680. Figures in parentheses are standard errors.

Source: Gansu Survey of Children and Families (2000, 2004).

The lack of a gender effect, and the marginal wealth effect, may be linked to the selection issue—the most vulnerable children are already out of school and thus do not contribute to the model.

Model 2, the extended main effects model, shows that the same variables—mothers' education and math scores—still matter, but that mothers' expectations and teachers' expectations in 2000 matter for children's aspirations in 2004, net of performance and other factors in the model. The coefficients imply that an additional year of mother or teacher expectations is about as beneficial as an additional year of mother education. This finding suggests that children benefit from having significant others with high expectations. We acknowledge, however, that the expectations measures could be partly based on unmeasured, additional information about student capabilities.

Having a male teacher has a marginally significant positive effect. Subsequent models testing interactions show only one significant result: a significant positive effect for males paired with male teachers. This interaction is robust to the inclusion of village fixed effects in model 7; the addition of village fixed effects substantially improves the explanatory power of the model ($R^2 = .18$, compared with $R^2 = .05$ for model 5, without fixed effects). With fixed effects incorporated, mothers' education becomes insignificant and mothers' expectations become marginal.

Parental expectations. What factors influence the educational plans of parents—important decisionmakers in the theoretical frameworks described above? We begin with mothers (table 3.6). The standard main effects model (model 1) includes measures of age, gender, logged wealth, mother's education, math performance, and teacher's gender, local status, and education. It shows that math performance, mothers' education, wealth, and gender predict mothers' expectations. Older children who remain in school also have mothers with higher expectations, though this effect may be an artifact of selection.

Model 2 adds teacher's expectations for the child in 2000. It shows that mothers of children whose teachers had high expectations for them in 2000 have significantly higher expectations for their children in 2004. Among the gender interactions tested, only wealth is marginally significant. The wealth interaction suggests that expectations for boys' education may be less susceptible to wealth than expectations for girls. This result is consistent with prior expectations about the nature of gender-poverty interactions. Tests of other gender interactions—with achievement and with relationships with teachers—have no significant findings. In the final fixed effects specification the gender-wealth interaction is statistically significant at conventional levels.

We estimate parallel models for fathers' expectations (table 3.7). The same caveat as above applies here: these results pertain to parents whose children were still in school. A slightly different picture emerges in the main effects specification (model 1).

Table 3.6. Estimates of mothers' expectations for children's educational attainment, Gansu Province, 2004

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent variable	**Standard main effects**	**Main effects**	**Poverty**	**Show promise**	**Teacher-child relation-ship**	**Village fixed effects**
Constant	6.73*** (0.80)	6.61*** (0.80)	5.20*** (1.09)	6.99*** (0.90)	6.59*** (0.87)	6.70*** (1.12)
Age 14	0.13 (0.19)	0.12 (0.19)	0.11 (0.19)	0.12 (0.19)	0.12 (0.19)	0.10 (0.19)
Age 15	0.17 (0.20)	0.15 (0.20)	0.15 (0.20)	0.15 (0.20)	0.16 (0.20)	0.26 (0.20)
Age 16	0.53** (0.22)	0.48** (0.22)	0.48** (0.22)	0.49** (0.22)	0.49** (0.22)	0.55** (0.21)
Child is male	0.34** (0.14)	0.31** (0.14)	2.95** (1.40)	–0.36 (0.75)	0.43 (0.59)	3.10** (1.35)
Log wealth	0.27*** (0.08)	0.26*** (0.08)	0.41*** (0.11)	0.26*** (0.08)	0.25*** (0.08)	0.35*** (0.12)
Mother's education (years)	0.08*** (0.02)	0.08*** (0.02)	0.08*** (0.02)	0.08*** (0.02)	0.07*** (0.02)	0.03 (0.02)
Child's math achievement, 2000	0.04*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.02*** (0.01)
Teacher is male	0.15 (0.15)	0.14 (0.15)	0.15 (0.15)	0.14 (0.15)	–0.08 (0.22)	0.21 (0.17)
Teacher is local	–0.13 (0.15)	–0.13 (0.15)	–0.13 (0.15)	–0.13 (0.15)	–0.10 (0.22)	0.13 (0.17)
Teacher's expectations of child's schooling, 2000		0.10*** (0.03)	0.10*** (0.03)	0.10*** (0.03)	0.11*** (0.04)	0.12*** (0.03)
Teacher is university graduate	0.12 (0.17)	0.13 (0.17)	0.12 (0.17)	0.13 (0.17)	0.23 (0.24)	–0.20 (0.19)
Log wealth × child's gender			–0.29* (0.15)			–0.31* –0.15
Math × child's gender				0.01 (0.01)		
Teacher's gender × child's gender					0.41 (0.30)	
Teacher local × child's gender					–0.08 (0.30)	

(continued)

Table 3.6. Estimates of mothers' expectations for children's educational attainment, Gansu Province, 2004 (continued)

Independent variable	Model 1 Standard main effects	Model 2 Main effects	Model 3 Poverty	Model 4 Show promise	Model 5 Teacher-child relationship	Model 6 Village fixed effects
Teacher's expectations × child's gender					–0.03 (0.05)	
Teacher's education × child's gender					–0.20 (0.34)	
Village fixed effects	No	No	No	No	No	Yes**
R^2	0.08	0.09	0.09	0.09	0.09	0.26

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Number of observations for all models = 1,629. Figures in parentheses are standard errors.

Source: Gansu Survey of Children and Families (2000, 2004).

As in the case of mothers, fathers with higher expectations are better educated, wealthier, and more likely to have sons than daughters. Additionally, model 2 shows that fathers of children whose teachers had high expectations for them in 2000 also have higher expectations for their children in 2004. Unlike for mothers, age is associated with reduced expectations for fathers. Fathers whose child's earlier teacher was a local also have lower expectations. One possible interpretation is that father's expectations are sensitive to perceptions of school quality—and that fathers associate local teachers with poor quality.

And unlike for mothers there is no wealth interaction with child gender for fathers. There are significant interactions with earlier math performance and teacher gender, suggesting that father's expectations respond more strongly to sons' math performance than to daughters'. Both of these findings are robust to the inclusion of village fixed effects in model 7—an addition that substantially improves model explanatory power. One possible explanation for the unexpected gender-performance interaction finding is that fathers of boys who are not performing well in school prefer them to work. This interpretation may hold if the opportunity costs for girls are perceived to be low. Fathers may respond more favorably to pairing sons with male teachers because they believe that male teachers provide role models for boys or because they perceive male teachers as higher quality. One anomalous finding occurs in model 7: having a university-educated teacher has a significant negative effect on fathers' expectations. This anomaly requires further scrutiny.

Table 3.7. Estimates of fathers' expectations of children's educational attainment, Gansu Province, 2004

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Independent variable	**Standard main effects**	**Main effects**	**Poverty**	**Show promise**	**Teacher**	**Preferred model**	**Village fixed effects**
Constant	5.01*** (0.80)	4.80*** (0.80)	5.26*** (1.10)	5.73*** (0.89)	5.58*** (0.86)	6.12*** (0.90)	8.52*** (0.95)
Age 14	–0.33 (0.21)	–0.35* (0.21)	–0.35* (0.21)	–0.34* (0.21)	–0.36* (0.21)	–0.34 (0.21)	–0.37* (0.20)
Age 15	–0.61*** (0.21)	–0.64*** (0.21)	–0.64*** (0.21)	–0.64*** (0.21)	–0.62*** (0.21)	–0.62*** (0.21)	–0.59*** (0.20)
Age 16	–0.49** (0.22)	–0.53** (0.22)	–0.530** (0.22)	–0.53** (0.22)	–0.51** (0.22)	–0.51** (0.22)	–0.52** (0.21)
Child is male	0.54*** (0.14)	0.51*** (0.14)	–0.33 (1.41)	–1.16 (0.72)	–0.77 (0.59)	–1.78** (0.76)	–1.28* (0.72)
Log wealth	0.45*** (0.08)	0.42*** (0.08)	0.37*** (0.11)	0.42*** (0.08)	0.41*** (0.08)	0.41*** (0.08)	0.20** (0.09)
Father's education (years)	0.98*** (0.02)	0.09*** (0.02)	0.09*** (0.02)	0.09*** (0.02)	0.09*** (0.02)	0.08*** (0.02)	0.05** (0.02)
Child's math achievement, 2000	0.05*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.02* (0.01)	0.03*** (0.01)	0.02* (0.01)	0.01 (0.01)
Teacher is male	0.14 (0.16)	0.13 (0.15)	0.13 (0.15)	0.13 (0.15)	–0.27 (0.23)	–0.31 (0.22)	0.06 (0.23)
Teacher is local	–0.43*** (0.16)	–0.43*** (0.15)	–0.43*** (0.15)	–0.42*** (0.15)	–0.54** (0.22)	–0.42*** (0.15)	0.06 (0.18)
Teacher's expectations of child's schooling, 2000		0.17*** (0.03)	0.17*** (0.03)	0.17*** (0.03)	0.13*** (0.04)	0.17*** (0.03)	0.16*** (0.03)
Teacher is university graduate	–0.25 (0.18)	–0.25 (0.17)	–0.25 (0.17)	–0.24 (0.17)	–0.14 (0.25)	–0.24 (0.17)	–0.48*** (0.18)
Log wealth × child's gender			0.09 (0.15)				
Math × child's gender				0.02** (0.01)		0.02** (0.01)	0.02** (0.01)
Teacher's gender × child's gender					0.73** (0.31)	0.82*** (0.30)	0.63** (0.29)
Teacher local × child's gender					0.23 (0.30)		

(continued)

Table 3.7. Estimates of fathers' expectations of children's educational attainment, Gansu Province, 2004 (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Independent variable	**Standard main effects**	**Main effects**	**Poverty**	**Show promise**	**Teacher**	**Preferred model**	**Village fixed effects**
Teacher's expectations × child's gender					0.07 (0.05)		
Teacher's education × child's gender					–0.21 (0.34)		
Village fixed effects	No	No	No	No	No	No	Yes**
R^2	.11	.13	.13	.13	.14	.14	.30

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Number of observations for all models = 1,692. Figures in parentheses are standard errors.

Source: Gansu Survey of Children and Families (2000, 2004).

Conclusions and implications

Findings in rural Gansu suggest that boys retain a modest enrollment advantage. Among enrolled students in 2004, boys' advantage in educational aspirations is very small. The boys' advantage is larger in parental educational expectations, but the gap pales next to the high absolute expectations for both girls and boys.

Many of the factors that might differentiate educational opportunities and aspirations of girls and boys and the expectations of their parents do not operate as expected. Tests of the interactions between gender and wealth, gender and prior performance, and gender and teacher characteristics did not yield compelling, consistent insights about factors that affect the education of girls and boys differently.

Some of the more interesting results can be found in the main effects specifications—factors that matter for outcomes across the board. Key predictors of enrollment are age, socioeconomic status, and performance. Net of these factors, boys enjoy an enrollment advantage. Boys' advantage declines when we take into account earlier expectations of mothers and teachers, significant across most specifications. Students' perceptions that the teacher pays attention to them and likes them have no impact on enrollment or gender gaps in enrollment. However, another set of variables reflecting social support early in schooling—mothers' and teachers' expectations—does matter. To the extent that these variables do not simply reflect unmeasured

information on student ability, they suggest the importance of early support from significant others in sustaining educational attainment.

Expectations of mothers and teachers, along with mothers' education (in most specifications) and children's prior math performance, also predict students' aspirations for schooling. For mothers' educational expectations, child gender and maternal education (in most specifications), household wealth, children's school performance, and prior teacher expectations matter. Educational expectations were higher among fathers of sons, wealthier fathers, more educated fathers, and fathers of children whose teachers were not local in 2000 (perhaps reflecting higher quality).

These findings suggest that parental calculations about investing in children's education may be much more complex than often portrayed. Both enrollment and parental expectations depend on how children are doing in school and the gender of the child. This finding is consistent with the family economic models discussed earlier, given that both variables relate to the likely return to investments in schooling. Less expected are the findings that earlier expectations by the child's primary teachers matter for outcomes in 2004, net of many controls. To the extent that these findings can be taken at face value, they suggest that parents' educational planning may be responsive not only to objective signals of performance quality but also to the degree of support and optimism offered by early teachers.

Our findings suggest that girls do not face substantially greater access barriers to basic education than do boys in much of rural Gansu. We cannot generalize from rural Gansu to other parts of rural China or to minority groups. However, we have reason to believe that our findings in Gansu are a conservative perspective on the closing of the gender gap. Recent analyses of national data from the 2000 census show that significant gender gaps at junior high school transition exist only among rural populations in a few provinces (Connelly and Zheng 2007b). One of these provinces was Gansu. More broadly, Connelly and Zheng's work shows that the gender gap in enrollment among children and youth—urban and rural, for majority and minority ethnic groups—is closing across China (Connelly and Zheng 2007a, b). This conclusion is consistent with findings from a detailed analysis of enrollment patterns in China's rural southwest, based on a sample that includes ethnic majority and minority groups (Davis and others 2007).

By 2004 the majority of children in rural Gansu who had entered school—girls and boys, wealthy and poor—were still in school at ages 13–16. Most of these children—both girls and boys—had high educational aspirations, aspirations not likely to be fulfilled due to the high cost of post-compulsory schooling. Parents' expectations for their children's future education are shaped much more by their own wealth than by the gender of the child. Given the rising inequality in China, addressing socioeconomic disparities in education may prove much more daunting than addressing gender disparities.

Annex to Chapter 3

Table 3A.1. Disruptive environment scale

Variable	Mean	Standard deviation	Cronbach's alpha
Disruptive environment scale	1.89	0.45	0.71
Students cheat on tests	1.89	0.45	0.66
Students copy others' homework	1.63	0.66	0.63
Some students disrupt class	1.90	0.67	0.67
There are fights between students	1.92	0.64	0.65
Some students tease others	2.01	0.61	0.68

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4 *Rural girls in Pakistan: Constraints of policy and culture*

Cynthia Lloyd, Cem Mete, and Monica Grant

Not all girls suffer the same educational disadvantages in Pakistan. Girls living in urban areas whose families come from the highest quartile of the income distribution are almost as likely as their male peers to have attended school or completed the five grades of primary schooling. By contrast, no more than a third as many girls as boys from the lowest income quartile of the income distribution who live in rural areas of Pakistan have ever attended school, and less than a quarter as many girls as boys in the same circumstances have completed primary school. Poor girls living in rural areas thus suffer a triple disadvantage, with their poverty and rural location compounding the gender-based disadvantage experienced by their better-off urban peers. The identification of policy prescriptions that could lead to the achievement of universal primary schooling in the context of these overlapping layers of disadvantage requires a full understanding of their determinants in Pakistan.

In explaining the relatively large and persistent countrywide gender gap in schooling, experts have typically given weight to both demand- and supply-side constraints. These include poverty and parental concerns about the safety and mobility of their daughters on the demand side and underinvestment in girls' schooling on the supply side. The very recent rapid rise in private school enrollment at the primary level in rural Pakistan (Sathar and others 2006; Andrabi, Das, and Khwaja 2002, 2006) suggests the possibility, however, that there may be a large reservoir of unmet

demand for girls' schooling in rural areas. These recent and dramatic shifts in the distribution of enrollment between the public and private sectors challenge us to seek a deeper understanding of the factors that may contribute to the multiple educational disadvantages that poor rural girls continue to face in Pakistan.

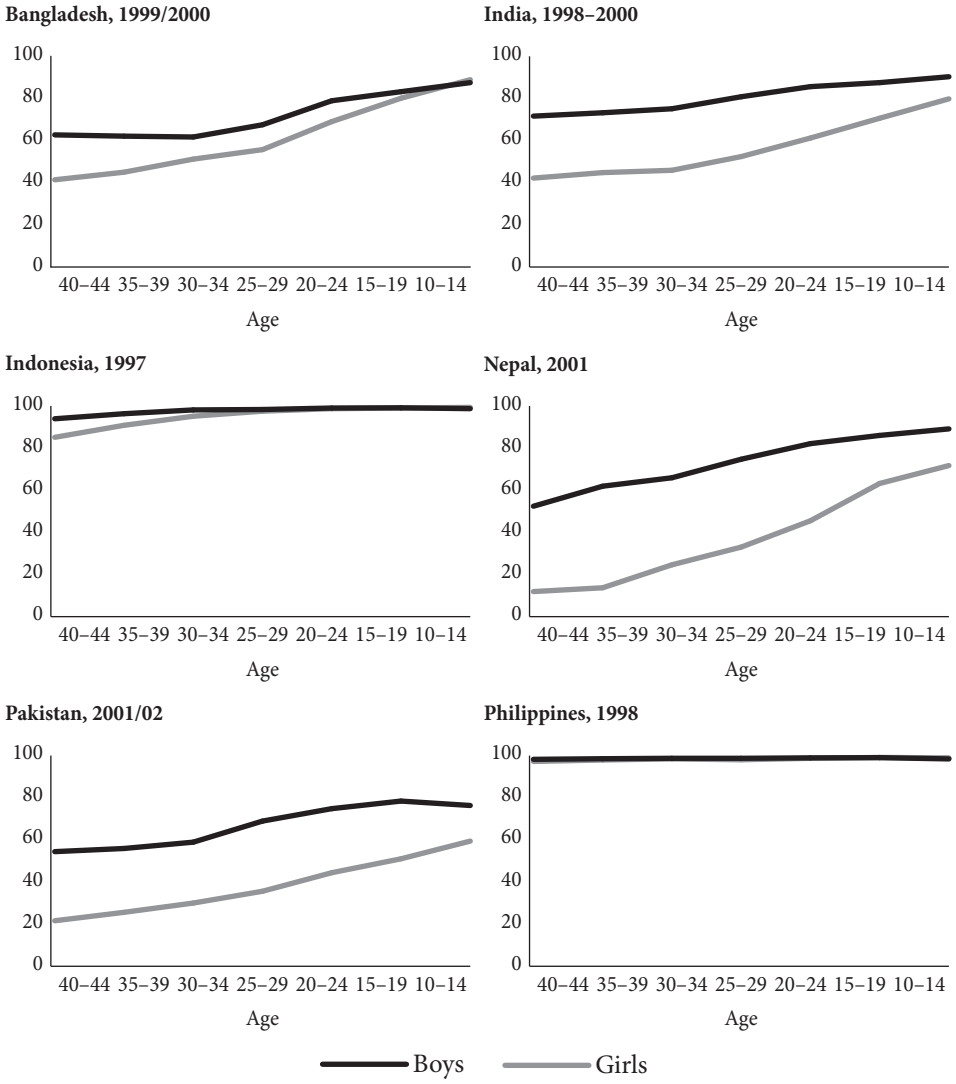
This chapter makes use of two relatively new data sets to explore some of the factors still limiting girls' participation in primary school, even in the context of the rapid growth of private primary schooling in rural Pakistan. The focus on primary school is justified by the fact that universal primary schooling remains an elusive goal in Pakistan, where large numbers of children, particularly girls, still never enroll in school, despite the very high estimated rates of return to primary completion (Behrman, Ross, and Sabot 2002).

This chapter begins with a brief review of the literature on girls' schooling in Pakistan in order to highlight the major factors that have been identified as potentially important to understanding the low levels of enrollment for girls in rural areas. It then describes the degree of gender inequality in school participation, using data from the 2001–02 national survey on adolescents and youth in Pakistan (Sathar and others 2003). The third part of the chapter relies on community data from the same national survey to explore some of the factors that have influenced the geographic placement of new government and private schools over the previous five years. We are especially interested in determining the extent to which new schools are being established in areas where girls have suffered particular disadvantage in the past (the poorest districts and those with the largest gender gaps in enrollment). The fourth part of the chapter relies on panel data collected in rural villages in the North West Frontier Province (NWFP) and Punjab (most recently in 2004) in order to explore, in a multivariate framework, some of the school and family factors associated with gender differences and variations in girls' enrollment rates. The last section draws conclusions and implications.

Education in Pakistan

The literature on and concern about the determinants of girls' relatively low levels of schooling in Pakistan can be traced back many years. While girls' enrollment rates have risen over time and gender gaps have narrowed, by the turn of the twenty-first century Pakistani girls had achieved levels of enrollment that were no better than those achieved by Indian girls 10 years earlier (Lloyd 2004). In the years since the eastern part of the original nation of Pakistan became the independent nation of Bangladesh, education of girls in Bangladesh has shown much more rapid improvement than in Pakistan, despite a much poorer initial resource base (Lloyd 2004). Currently, Pakistan lags behind all of its Asian neighbors except Nepal with respect to overall enrollment rates for girls (figure 4.1). As of 2001/02 the overall percentage of 10- to 14-year-old girls who had ever attended school had not quite reached 60 percent (Lloyd 2004).

Figure 4.1. The percent of boys and girls that ever attended school, by age, in six countries



Source: Lloyd (2004).

Poverty, cultural constraints, and an inadequate supply of government schools for girls in some rural areas are the three principal factors consistently identified in the literature in explaining the gender gap in primary school enrollment and the persistent disadvantage of rural girls. These factors would seem to form a vicious negative

cycle because the same societal attitudes emphasizing girls' modesty, protection, and seclusion, which are said to limit parents' willingness to send their girls to school, are also likely to be prevalent among the provincial and district education officers responsible for building and provisioning new schools in relatively poor rural areas, as well as among the teachers who staff the schools.

Furthermore, the most traditional attitudes toward girls' schooling tend to be held by the least educated, leading to a perpetuation of disadvantage, because the least educated parents, who are also the poorest parents, are least inclined to educate their girls and typically live in villages where others share their views. Mothers' education rather than fathers' matters most in decisions about the education of their daughters, a pattern consistently confirmed in the empirical literature on schooling in Pakistan (see, for example, Holmes 2003; Sathar and Lloyd 1994; Pakistan 1998; World Bank 2002).

Most published studies analyzing the determinants of enrollment have found the association between household or family income and girls' enrollment to be positive and statistically significant, whether it is measured directly, using detailed household consumption data, or more indirectly, through some aggregation of household assets (World Bank 2002; Pakistan 1998; Sathar and Lloyd 1994; Hazarika 2001). Furthermore, in most cases, when results for boys and girls are compared, the size and significance of income effects are larger for girls than boys (World Bank 2002; Pakistan 1998; Sathar and Lloyd 1994).

A few recent studies have explored the separate role of permanent income relative to temporary income shocks—an important distinction in a context where the majority of poor rural residents have limited, if any, capacity to insure against risks and are very vulnerable to sudden negative shifts in income. Using rural panel data from 1986–91, Sawada (1999) finds that transitory income shocks (including deaths of household members, deaths of animals, and deviations from average rainfall) affect children's enrollment significantly, with a greater impact for girls. Lloyd, Mete, and Grant (2006) find the loss of remittances (a relatively uncommon phenomenon) to be a significant factor increasing the likelihood of dropout for boys.

There are other demand-side factors that are less commonly explored in the literature but are also potentially important, particularly for girls. They include the persistence of relative high fertility in rural Pakistan (although it is now beginning to decline) as well as the relatively poor health and nutritional status of poor rural children of school age. Indeed, Lloyd, Mete, and Grant (2006) find that whether or not a mother had had an unwanted child in the past six years was one of the most significant factors associated with dropout rates for girls but not for boys between 1997 and 2004 in rural NWFP and Punjab. Alderman and others (2001) also find evidence of the potential importance of preschool nutrition for school enrollment, with larger effects for girls than boys.

Before the rule of General Zia ul Haq in the late 1970s, coeducation in rural primary schools was more common. During the peak of the Islamization process, girls

were often forced to withdraw from coeducational primary schools despite the lack of alternatives (Shaheed and Mumtaz 1993). The tradition of single-sex schooling in Pakistan—a tradition that assures parents that their daughters will be taught exclusively by women—has created considerable challenges to the delivery of educational services in rural areas given the shortage of qualified female teachers in many parts of rural Pakistan. A principal constraint on girls' schooling in Pakistan has been the supply of all girls' government schools. In their assessment of learning in primary schools in Pakistan, Warwick and Reimers (1995) suggest that it was never the policy of the government to provide equal educational access and that the Pakistani government followed a rough rule of thumb, building one girls' primary school for every two boys' primary schools. While some girls attend boys' primary schools, particularly in rural villages where no girls' primary school is available, it is rare to find girls progressing beyond preprimary grades in boys' schools, even to the first few grades (Sathar, Lloyd, and ul Haque 2000). Furthermore, when girls attend boys' primary schools their attendance rates are very low, according to a 1997 rural survey of schools in 12 villages (36 percent compared with 88 percent in girls' schools) (Sathar, Lloyd, and ul Haque 2000). Thus it would appear that given current conditions, girls do not thrive in boys' government schools.

Every study of the determinants of primary school enrollment in Pakistan that has included some data on primary school access in the community (measured by the presence of a gender-appropriate school within the community or within some reasonable distance from the center of the community) has found access to be a significant factor explaining variation in enrollment across communities, particularly for girls (Alderman and others 1995; Sawada and Lokshin 2001; Sathar and Lloyd 1994; Durrant 1999; Alderman and others 2001; Hazarika 2001; Lloyd, Mete, and Sathar 2005; World Bank 2002, 2005). Indeed, there appear to have been more studies of the effects of primary school access on enrollment in Pakistan than in any other country—a clear sign of its importance. These studies are based on data that range from the mid-1980s to the late 1990s, indicating that the problem has persisted for many years. Given the very rapid rise in private coeducational schooling in rural areas in recent years, it is of interest to see whether access to primary schooling for girls remains as big a problem now as it was in the past.

Additional factors of potential importance on the supply side include the poor quality of government primary schools, the hidden costs to parents and children of government school attendance due to pervasive corruption and discriminatory treatment, and the local availability of postprimary schooling. Recent evidence suggests that some aspects of primary school quality may be important factors for parents in deciding whether to send their children to school. Using data collected in rural Punjab and NWFP in 1997, Lloyd, Mete, and Sathar (2005) find that a measure of the share of teachers residing in the community (a proxy of the extent of teacher absenteeism) is a statistically significant factor inhibiting girls' enrollment but an unimportant factor

for boys.[1] Absenteeism among teachers is also a more important problem in government girls' schools than government boys' schools. In a survey of primary schools in 12 rural villages of Punjab and NWFP, Sathar and others (2003) find that 31 percent of teachers at government girls' schools and 19 percent of teachers at government boys' schools were absent. The teacher absenteeism rates in the Pakistani data sets are similar to those observed in India.[2]

Primary school costs have also been found to be a more inhibiting factor for girls than boys. Among the direct costs that may be underreported and hard to trace are the bribes that parents often must pay to teachers to gain admittance or maintain the standing of their children in school, an extra cost that may differentially jeopardize girls' schooling. In a household survey in Pakistan described by Transparency International (2002), many parents report irregular admissions procedures and persistent corrupt practices after admission requiring various forms of payment in exchange for a child's admittance or continued good standing in school. The presence of a middle school within the community has also been documented to be a statistically important factor explaining variations in enrollment rates across communities (World Bank 2002, 2005).

Girls' disadvantage in enrollment: existing evidence and data

Data from the 2001/02 national survey of adolescents and youth in Pakistan provide some excellent descriptive documentation of the extent of girls' disadvantage in primary enrollment (Sathar and others 2003). These data can be broken down by gender, residence, province, and household economic status. While Pakistan is home to four major ethnic groups (Baluchi, Punjabi, Pushtun, and Sindhi), their geographic location is roughly mirrored by provincial boundaries, thus making it impossible to disentangle ethnic differences in enrollment from provincial differences.[3] To measure household economic status, an asset index was created using information on house-

1 One reported reason for absenteeism is that teachers in the public sector often secure their positions by paying substantial bribes to politicians and bureaucrats—outlays that require that they take on side jobs to cover their investment. These side jobs require that they be absent from school (Hasnain 2005).

2 Kremer and others (2005) find that 25 percent of teachers were missing at the time of the interviews in Indian primary schools. They document lower absentee rates in private schools and among teachers from local areas. Cross-country evidence reported by Chaudhury and others (2006) reveals that teacher absenteeism rates in India and Pakistan are on the high side of the distribution, exceeded only by Uganda (with a 27 percent primary school absentee rate). The average absentee rate for the six countries included in the authors' study is 19 percent.

3 Provincial ministries of education hold much of the policy and budgetary authority for primary schooling in Pakistan. Provincial differences in enrollment thus reflect differences in provincial educational investments and policy priorities as well as social, economic, and cultural differences, including ethnic differences.

Table 4.1. Percentage of all 15- to 19-year-olds in Pakistan who ever attended school, by economic status, location, and gender, 2001/02

	Rural			Urban		
	Boys	Girls	Gender gap	Boys	Girls	Gender gap
Household economic status[a]						
Low	66.1	22.3	43.8	51.9[b]	40.4[b]	11.4
Low-medium	82.0	37.1	44.9	77.4	46.3	31.1
Medium-high	91.9	67.5	24.4	84.2	70.1	14.1
High	96.6	81.5	15.1	96.6	90.3	6.3
Province						
Punjab	83.1	51.5	31.6	90.8	87.9	2.9
Sindh	77.4	35.2	42.2	91.1	75.4	15.7
NWFP	89.4	39.0	50.4	91.0	63.3	27.7
Balochistan	73.7	31.7	42.0	85.5	47.9	37.6

a. For definition of household economic status, see footnote 4.
b. Fewer than 30 cases.

Source: 2001/02 National Survey of Adolescents and Youth in Pakistan.

hold possessions and amenities.[4] This asset index can be interpreted as a proxy for the permanent income of the household.

Among Pakistanis 15–19 years old who ever attended school, the gap between boys and girls in the richest group is small relative to that in the poorest group in both urban and rural areas (table 4.1). The gender gap in enrollment is 15 percentage points among the richest rural youth but 44 percentage points among the poorest rural youth. Furthermore, the gender gap widens steadily from the highest to the lowest economic group. Girls' enrollment is highest in Punjab, but the gender gap among the poorest rural adolescents is also highest there, exceeding 50 percentage points (table 4.2).

Following the lead of the National Research Council/Institute of Medicine panel report on transitions to adulthood in developing countries (Lloyd 2005), we develop an index of inequality in order to capture a gender-specific measure of the degree of inequality across economic or residence groups. The index ranges from 0 to 100, with 100 representing the most extreme form of inequality (the complete nonenrollment of

4 Twenty-nine variables collected at the household level on household possessions and amenities were used as inputs into a principal components analysis based on the full sample (urban and rural residents combined). The first component was scored and households divided into quartiles. Each youth interviewed was linked to the socioeconomic status of his or her household. Because some households had more than one young person, the respondents are not evenly distributed across quartiles (Sathar and others 2003).

Table 4.2. Percentage of poorest rural 15- to 19-year-olds in Pakistan who ever attended school, by province and gender, 2001/02

Province	Boys	Girls	Gender gap
Punjab	72.8	22.1	50.7
Sindh	60.8	22.0	38.8
NWFP	66.8	27.7	39.1
Balochistan	58.1	18.2	39.9

Note: Figures are for youth from lowest quartile of household economic status index. See definition in footnote 4.

Source: 2001/02 National Survey of Adolescents and Youth in Pakistan.

Table 4.3. Index of rural/urban residence and income inequality in percentage of 15- to 19-year-olds who ever attended school, by gender and income, 2001/02

Province	Girls	Boys	Gender gap
Rural/urban			
Punjab	41.4	8.5	32.9
Sindh	53.3	15.0	38.3
NWFP	38.4	1.8	36.6
Balochistan	33.8	13.8	20.0
Pakistan	44.9	9.8	35.1
Lowest quartile/highest quartile			
Punjab	77.2	25.6	51.6
Sindh	71.7	36.4	35.3
NWFP	56.4	32.1	24.3
Balochistan	78.7	42.5	36.2
Pakistan	74.3	32.0	42.3

Note: See footnote 5 for explanation of index of inequality.

Source: 2001/02 National Survey of Adolescents and Youth in Pakistan.

the disadvantaged group) and 0 representing complete parity across groups.[5] A value of 50 can be interpreted as indicating that the more disadvantaged group has an enrollment rate that is 50 percent that of the more advantaged group.

For Pakistan as a whole, enrollment by rural girl is 45 percentage points lower than that of urban girls, while enrollment by rural boys is only 10 percent lower than

5 The index is calculated as one minus the ratio of ever attendance of the most disadvantaged group (rural residents or those in the bottom quartile of the socioeconomic index) to ever attendance of the most advantaged group (urban residents or those in the top quartile of the socioeconomic index), multiplied by 100.

that of urban boys (table 4.3). Thus rural boys suffer much less inequality in enrollment relative to urban boys than do rural girls relative to urban girls. Similar patterns exist if one measures inequality between rural and urban areas in parental aspirations for their children's education (the percentage of parents who say that their daughters or sons "should attain secondary or higher education" or "should attend school as long as they want"), but the degree of inequality is much smaller. Eighty percent of parents of rural girls and 93 percent of parents of urban girls express the aspiration that their daughters obtain secondary or higher education; for boys the difference is just 2 percentage points (data not shown).

The degree of inequality between the richest and poorest groups is even greater. The poorest girls have enrollment rates that are almost 75 percent lower than the richest girls, while the poorest boys have enrollment rates that are 32 percent lower than the richest boys. Similar gender differences exist in indices designed to capture inequalities in primary school completion (data not shown).

Geographically, gender differences in the degree of economic inequality are greatest in Punjab and smallest in NWFP. Overall levels of economic inequality for both boys and girls, however, are greatest in Balochistan, Pakistan's poorest province. Gender differences in the degree of inequality between rural and urban areas are greatest in Sindh and NWFP, with overall levels of inequality for both boys and girls greatest in Sindh. Thus both geography and economic status matter in explaining the particular disadvantage of girls.

Parents of rural girls are much more likely than parents of rural boys to cite lack of access (no school available or school too far away) or parental disapproval (including "seeing no benefit") as reasons for nonenrollment. Parents cite costs as important reasons for both boys and girls (data not shown). While school quality is rarely cited as a reason for nonenrollment for either boys or girls, it is possible that parental disapproval is tied up with school quality if there are particular features of schools (such as the presence of male teachers or the absence of proper toilet facilities) that lead parents to disapprove of school in its current form.

Are new schools in rural areas addressing the needs of the most disadvantaged girls?

School access has been an important factor inhibiting girls' enrollment, particularly in rural areas. Changes in government educational policy in recent years, as well as the rapid growth of low-fee private schools in rural areas, may be changing the educational opportunity structure for poor rural girls. The Education Sector Reform Action Plan (2001–05) has broadened the criteria for placing new government primary schools in rural areas beyond the traditional criterion of village size (more than 500 residents) to include considerations of gender and need (World Bank 2005).

Using both community and household data from the 2001/02 National Adolescent and Youth Survey, we explore the distribution of private and government girls' primary schools in rural areas and how it changed from 1997 to 2002 (table 4.4). The 150 rural communities in the sample are categorized by quintiles according to the mean household asset count in the community and the extent of the average gender gap in primary enrollment in the community.[6] The extent of gender disparity in the community is measured as the ratio of the percentage of males 15–24 who ever enrolled in primary school to the percentage of females 15–24 who did so, with the highest values representing the most extreme gender disparity and the lowest values (closest to one) representing the smallest disparity. By using the age group 15–24, we are capturing the situation roughly 10 years before the survey, in the early 1990s, when the group would have been 5–14.[7] The determination of schools' availability five years before the survey is derived from data on the establishment date of each school listed in the community survey.[8]

We find a strong positive association between the percentage of communities with a private primary school and the economic standing of the community during both time periods, with 15 percent of the poorest communities and 44 percent of the richest rural communities having a private school by 2002. Furthermore, the absolute growth in the percentage of communities with a private primary school was greatest in the better-off communities.[9] The association between the community's economic standing and the percentage with a government girls' school is also notable among communities in the three lowest quintiles, but that association does not persist among better-off communities. In 2002 only 43 percent of the communities in the lowest economic quintile had a girls' government school. The figure was 89 percent in the middle quintile and 78 percent in the highest quintile. Over the five-year period, the greatest absolute growth in the number of communities with a government girls' primary school occurred in the poorest and the richest communities.

We find a clear correlation between the extent of gender disparity at the community level and the percentage of communities with a private school. The smaller the disparity or the greater the equity in past enrollment, the more likely it is that a community will have a private school. If anything, this association appears to have

6 We use this asset count indicator to rank communities by economic or wealth status rather than the asset index presented earlier, because it allows more differentiation among rural residents. The household economic index presented earlier for the whole sample groups most of the rural communities in the lower quintiles.

7 The typical age for starting school in Pakistan ranges from five to seven.

8 We assume that the number of schools that existed in 1997 is simply the number of schools existing in 2002 minus the number of schools established since 1997. In the absence of data on school closures, we have to assume that no schools that existed in 1997 were closed before our survey in 2002. We also assume that all middle schools have primary school sections and that the count of available primary schools in rural areas is thus the sum of all primary and middle schools. This seems a reasonable assumption, since our panel data show that it is a common pattern for primary schools to add a middle school section as they expand.

9 The results are the same if we confine the analysis only to private for-profit schools because very few private schools in our sample were nonprofit schools or schools supported by nongovernmental organizations.

Table 4.4. Percentage of rural communities in Pakistan with private or girls' primary schools, by asset ownership and gender enrollment ratio, 1997 and 2002

	Private primary school			Government girls' primary school		
	1997	2002	Change	1997	2002	Change
Community asset quintile						
Low	9	15	+6	34	43	+9
Low-medium	4	15	+11	57	63	+6
Medium	15	26	+11	81	89	+8
Medium-high	19	43	+24	67	71	+4
High	22	44	+22	67	78	+11
Male/female enrollment ratio						
High disparity	4	9	+5	30	38	+8
High-medium	11	21	+10	58	66	+8
Medium	19	31	+12	77	85	+8
Low-medium	4	33	+29	71	75	+4
Low disparity	27	40	+13	73	80	+7

Source: 2001/02 National Survey of Adolescents and Youth in Pakistan.

strengthened over the five-year period. Thus it would appear that communities are seen to be more suitable to private school formation when the gender disparity in enrollment is relatively narrow, ensuring entrepreneurs of more potential clients.

Next we explore the question of the determinants of new school formation in rural Pakistan in a multivariate framework, using the rural village (or primary sampling unit) as the unit of analysis. In the case of the formation of private schools, which in Pakistan are typically for-profit coeducational schools, we are interested in some of the community characteristics that might make a rural community appear to provide a good business opportunity to a private entrepreneur. Among possible factors we include parental capacity to pay (in the form of the mean community household asset index and a measure of the degree of within-community wealth inequality),[10] the availability of adult females with teaching qualifications (the percentage of adult

10 Household asset inequality is measured as the ratio of the asset index for households in the 75th percentile of the household asset distribution to the asset index among households in the 25th asset percentile of the distribution. This is a measure proposed by James (1993) in her study of the factors affecting the cross-national variation in the public/private mix of educational services. She hypothesizes that in the context of relatively low levels of public school quality, differential preferences among parents for various levels of school quality could lead to greater demand for private schooling when there is greater income diversity within the community.

women in the community who completed secondary schooling),[11] the relative size of the client population (proportion of the sample population that is 5–15),[12] the existence of competition (the existence of a private school in the community and the existence of a government girls' primary school in the community), and a measure of unmet need for primary schools for girls (the male/female ratio of the percentage of 15- to 24-year-olds who ever enrolled).

Our probit regression results show that, while most variables work in the hypothesized direction, the key statistically significant variable predicting the establishment of a new private for-profit school in the community between 1997 and 2002 was the variable measuring the extent of gender disparity in enrollment (table 4.5). (The positive association between household assets index and the establishment of a private school is also weakly significant, at the 10 percent level, in one of the three specifications.) Communities with greater gender equity in enrollment were those most likely to acquire a new private for-profit school over the five-year period. From a business point of view, private entrepreneurs may see themselves as more likely to persuade parents who are already committed to girls' schooling to consider private school than they are to persuade parents who have not yet decided to send their girls to school to send them to a private school. That conclusion is also supported by Lloyd, Mete, and Sathar (2005), who show, through a series of simulations, that the arrival of a private school in the community is unlikely to have much impact on overall enrollment rates but is likely to have greater impact on the distribution of enrollment between the private and public sectors. Thus private schooling does not seem to be addressing the needs of girls who have not yet had an opportunity to go to school. It is more likely to be giving additional choices to the parents of girls who have already decided to enroll them.

These findings, which focus on the establishment of new private primary schools during a recent five year period, complement findings from a related study of the determinants of private school formation in rural Punjab over a twenty year period since 1981 (Andrabi, Das, and Khwaja 2006). The major finding from this study was the importance of a girls' high school in the community in predicting the likelihood of new private school formation. This is because most private school teachers are women who were educated in the same village as the one they are teaching in. Communities with girls' high schools are likely to be the very same communities where there is greater gender equity enrollment.

The decision rules adopted by officials in the Ministry of Education to determine the placement of new government primary schools should be different from the

11 In an analysis of the cross-community variation in private school availability based on the 2001/02 Pakistan Integrated Household Survey, the presence of a high school for girls within five kilometers (suggesting the availability of qualified teachers within the community) was found to be a highly significant variable (World Bank 2005).

12 Unfortunately, we lack data on the total population of each community or the absolute size of the youth population.

Table 4.5. Probit regression coefficients for new school formation in rural areas of Pakistan, 1997–2002

Independent variable	Private primary school			Government girls' primary school		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Number of household assets	0.16*	0.10	0.10	0.05	0.06	0.15
Asset inequality	–0.49	–0.70	–0.48	0.05	0.10	0.30
Percentage females completed secondary school	2.41	1.58	0.97	0.32	0.60	–0.04
Proportion of population 5–15	1.76	3.90	2.95	–1.66	–1.85	–6.94**
Access to private school in 1997	0.37	0.19	0.21	–0.46	–0.41	–0.85
Access to girls' government school in 1997	–0.22	–0.49	–0.50	–0.58**	–0.54*	–1.08***
Male/female enrollment ratio		–0.21**	–0.21**		0.02	0.03
Province						
Sindh			–0.71			–0.99*
NWFP			–0.21			1.46**
Balochistan			0.52			0.28

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Number of observations across all models is 150.

Source: 2001/02 National Survey of Adolescents and Youth in Pakistan.

decision rules guiding private entrepreneurs, but in both cases an assessment of demand (or need) should be critical. For this reason we use the same set of variables in a multivariate analysis of the potential factors influencing new government school formation. Using the Education Sector Reform guidelines to consider gender and need in the placement of new government primary schools, we might expect that new girls' schools would be most likely to be established in poorer communities, in communities that did not previously have a government girls' school, and in communities in which the gender disparity in enrollment is most extreme. In fact, the coefficients for the community's economic status and the extent of gender disparity in enrollment in the community are not statistically significant. The most important factor affecting

the likelihood that a new government girls' school will be built in the community is the lack of such a school, with communities much more likely to gain a new government girls' primary school if they did not already have one. Despite this, many of the poorest communities (57 percent) and the communities with the highest gender disparities (62 percent) still lack a girls' school (see table 4.4). Furthermore, commitment to establishing new girls' schools varies significantly by province. Ministry authorities in NWFP were much more likely over the five-year period to have established new girls' schools in rural areas than ministry authorities in Punjab, while ministry authorities in Sindh were significantly less likely to have done so. With the current pace of coverage expansion, it will still be many years before every community will have a government girls' primary school.

What factors affect girls' enrollment in rural Pakistan?

A 2004 survey of 12 rural villages in Punjab and NWFP included 597 women who had been interviewed in 1997, when they were married and between the ages of 20 and 45. The data include a full education history for each of their children. These data are complemented by and can be linked to a survey of primary schools attended by children in the community. In our analysis potential factors that may be important in explaining variations in enrollment in primary school among children 10–14 include household characteristics (including recent economic and demographic shocks since the previous wave of data collected in 1997), school characteristics (including public and private school availability, costs, and quality at the time each child in the analysis was 10), and a rating of overall level of community development.[13]

In interpreting the findings, it is important to understand some of the recent changes occurring in these communities, particularly as they relate to school choice. In 1997 there were 12 government girls' primary schools in these communities.[14] Between 1997 and 2004, one new government girls' school became operational and the number of private schools located in the 12 villages rose from 12 to 33.[15] The number of private schools outside the villages but nearby rose from 10 to 19, expanding still further the choice available to parents.

With such a dramatic expansion of school availability and choice, we might have expected a dramatic increase in primary school enrollment. In fact, during this same period, enrollment among 10- to 14-year-olds rose only modestly, from 90 percent to 93 percent for boys and from 66 percent to 71 percent for girls. Much more dramatic

13 Community development is measured with an index that awards one point for the presence of each of seven elements within the primary sampling unit: a metalled road, public transport, sewerage, electricity, telephone, natural gas, and paved streets.

14 Ten villages had at least one girls' government primary school; two did not.

15 In 1997, 4 of the 12 communities had at least one private coeducational school within the village; in 2002 the number of communities with a private for-profit coeducational school had grown to seven.

Table 4.6. Descriptive statistics for estimation of maximum-likelihood probit model of enrollment of children 10–14 in Pakistan (percent, except where otherwise indicated)

Statistic	Boys	Girls	Total
Ever enrolled in school	89.9	68.8	79.8
Mother ever attended school	22.2	20.9	21.6
Father blue-collar or agriculture	55.1	62.3	58.6
Monthly household consumption (thousands of Rs)	6.9	6.9	6.9
Crop loss	16.7	17.5	17.1
Any other shock	48.5	52.4	50.4
Unwanted birth	39.6	40.4	40.0
Availability of public primary school	100.0	83.0	91.9
Availability of private primary school	53.1	50.9	52.0
Cost of public primary school (Rs)	94.1	93.5	93.8
Cost of private primary school (Rs)	214.4	214.1	214.2
Public school teachers live in community	23.7	17.2	20.6
Private school teachers live in community	28.0	27.1	27.6
Community development index (2–3)	26.8	26.2	26.5
Community development (4)	50.6	50.9	50.7
Community development (5–6)	22.7	22.9	22.8

Source: 2004 Changing Educational Opportunities Survey in Rural Punjab and NWFP.

was the shift in the composition of enrollment, as younger cohorts were more likely than slightly older ones to attend private school (Sathar and others 2006).

During this period the public sector made substantial investments in upgrading primary schools, with notable improvements in toilet facilities for girls and a significant decline in teacher absenteeism (Lloyd, Mete, and Grant 2006). Many schools added a middle school section to an already existing primary school, although this was much more likely to happen in private than in public schools (Sathar and others 2006). As the number of private schools expanded, the percentage of private school teachers who were female declined, from 85 to 69 percent, possibly suggesting that the number of women potentially qualified to become teachers was insufficient to support such a rapid expansion in private schools without some growth in the number of male teachers.

Variable means and the results of our maximum-likelihood probit models reveal several interesting points. The cost of private school (as reported by parents) is only twice the cost of public school (table 4.6). The percentage of local teachers (teachers

who live in the village) is not significantly different in public and private schools. Roughly half of the children in the sample have access to a private school in their village. As many as 40 percent of children 10–14 had mothers who had given birth to an unwanted child in the previous six years (between the two survey waves). Other household shocks, such as crop loss, are much less common; for example, no more than 18 percent of children live in households that had experienced such a loss in the past six years.

Regression results for boys and girls are presented separately. Three models are compared: one including basic household and community characteristics, a second that is expanded to include the occurrence of household shocks during the previous six years, and a third that is expanded still further to include information on public and private schools within the village (table 4.7). The discussion here focuses on model 3 because the inclusion of all the variables in the full model does not appear to affect the results for the specific variables included in the other models.

For both boys and girls, household consumption and community development show a strong, positive, statistically significant association with enrollment. Whether or not a girl's mother ever enrolled in school is also significantly associated with enrollment. As far as the experience of household shocks is concerned, the occurrence of a crop loss in the previous six years is a statistically significant factor discouraging enrollment for girls while it is unimportant for boys. For boys only one household shock—the arrival of an unwanted child—has a statistically significant effect (at the 10 percent level) on enrollment, and its effect is positive rather than negative, as would have been expected. This demographic household shock, which has previously been shown to increase the likelihood of dropout for girls in grades 1–8 (Lloyd, Mete, and Grant 2006), has a negative effect on the likelihood that girls will enroll, as expected, but the estimated coefficients are not statistically significant at the 10 percent level.

The presence of a government girls' school in the village contributes positively to the likelihood of enrollment, while the presence of a private school does not. However, only two of the 12 villages lacked a government girls' primary school at the time the children were 10 years old, but five or six villages lacked a coeducational private school accessible to girls, depending on the year that children in the sample entered school. The percentage of government primary school teachers living in the community—a proxy for school quality—was also a statistically significant and positive factor in enrollment decisions for girls, but it appears to be a negative factor for boys. In contrast, for girls the percentage of private school teachers residing in the community contributes negatively to overall enrollment rates. It could be that the community residence of teachers captures two conflicting aspects of quality: resident teachers are both less likely to be absent and more likely to be poorly qualified. These factors may balance out differently in different types of schools, and they may have differential effects on parental decisions about enrollment for boys and girls. Finally, school costs, calculated as village-level means of reported household expenditures on school fees, uniforms,

Table 4.7. Probability of ever enrolling in primary school for children 10–14 in two Pakistani villages, 2004

Independent variable	Boys			Girls		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Household characteristic						
Mother's schooling (1 = ever in school)	0.03	0.03	0.03	0.29***	0.30***	0.18***
Father's occupation (1 = agriculture or blue collar)	–0.02	–0.01	–0.01	–0.04	–0.05	–0.06*
Log of monthly household consumption	0.07***	0.07***	0.06***	0.07***	0.08**	0.10***
Community development dummies						
Middle third	0.12***	0.13***	0.11***	0.04	0.01	0.34**
Upper third	0.09***	0.09***	0.08**	0.29***	0.26***	0.32***
Household shock dummies						
Crop loss		0.00	–0.00		–0.15**	–0.16***
Any other household shock		0.01	0.01		0.07	0.03
Unwanted birth		0.04*	0.03*		–0.05	–0.02
School access within village						
Public			—[a]			0.80***
Private			–0.03			0.04
School costs[b]						
Public			0.00			0.01**
Private			–0.00			–0.00***
Percentage of teachers resident[b]						
Public			–0.14*			0.67**
Private			0.11			–0.85***
Number of observations		433			400	

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

a. Dropped because all villages have at least one government boys' school.
b. If no school is available in village, the variable is set equal to zero. If there is more than one school in the category in the village, the variable measures the average of all village schools in category.

Source: 2004 Changing Educational Opportunities Survey in Rural Punjab and NWFP.

stationery, and books for government schools and private schools separately, show a positive and significant association with girls' enrollment in the case of public schools and a negative and statistically significant association with girls' enrollment in the case of private schools.

Conclusions and policy implications

Despite the dramatic expansion of primary school availability and choice in Pakistan, the percentage of poor rural girls enrolled in school remains low. This finding may be partially explained by the fact that school choice has expanded most (through the establishment of private schools) in richer communities and in communities in which gender disparities in enrollment are narrower—that is, in communities in which girls' enrollment rates were higher to begin with. As a result, many of the poorest communities and the communities with the highest gender disparities still lack a girls' school. Between 1997 and 2004, there was substantial variation across provinces in the rate of establishment of new government girls' schools, with NWFP building more new rural government girls' schools than other provinces. It thus appears unlikely that the expanding private sector can fully substitute for the public sector in addressing the educational needs of poor rural girls.

The poorest rural girls still seem beyond reach in many settings, in some cases because villages are sparsely settled, making it expensive for the government to establish separate primary schools for boys and girls. In such circumstances it is critical to provide each village with at least one school, ideally a government school, that is a welcoming place for girls. Unfortunately, it is in these very settings that it is difficult to find qualified female teachers, given historical gender disparities in enrollment. While the data indicate that rural parents strongly prefer to have their girls taught by women (Sathar, Lloyd, and ul Haque 2000), it is not known whether parents might be more receptive to coeducational government schools if some of their concerns for the safety and protection of their daughters could be met in ways other than through the presence of female teachers.

The search for solutions will require some program experimentation and evaluation. If a more cost-effective model could be found and implemented, we would predict that the gender gap could narrow considerably, because the poorest communities are the least likely to have a school that is welcoming to girls.

Even if government primary schools were made equally welcoming to boys and girls, we would still expect some of the gender gap to remain. Some of the remaining barriers to girls' schooling are clearly economic, with parents somewhat less willing to invest in girls' schooling than in boys'. This hypothesis is supported by the finding that household economic shocks affect girls' schooling negatively but have no such effect on boys. These results may also explain why the rapid expansion in

private schooling in rural communities has not had a more positive effect on overall enrollment rates, particularly for girls. These remaining barriers could be addressed through conditional grants or subsidies to support girls' attendance in school, fairer recruitment practices, and greater accountability by teachers in the public sector in order to minimize bribes and other hidden expenses.

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5 *Girls in India: Poverty, location, and social disparities*

Kin Bing Wu, Pete Goldschmidt, Christy Kim Boscardin, and Mehtabul Azam

Impressive gains have been made in bridging gender and social gaps in primary education in India, with an estimated 94 percent of all 6- to 13-year-olds now in school. But secondary enrollment remains under 40 percent. Enrollment—and outcomes—are particularly weak among scheduled tribes, which make up 8.2 percent of the population, and scheduled castes, which make up 16.2 percent (Census of India 2001).[1]

On the margins of society, these groups have limited access to everything—social services, credit, land, and other assets. Membership in these groups is highly correlated with poverty and rural location (more than 70 percent live in rural areas). The depth of social exclusion creates a huge challenge for India.

A patriarchal social structure with a strong male preference predominates in many communities, resulting in gender disparities in all human development indicators (Filmer, King, and Prichett 1998; Siddhanta and Nandy 2003). Discrimination

The authors are grateful to Deepa Sankar for her contributions to the literature review and data analysis and to Venita Kaul for constructive comments.

1 Scheduled tribes settled in the subcontinent in prehistoric times and were pushed back to remote areas by successive waves of invasion and settlement. Scheduled castes are those once known as "untouchables" (*Dalits* in Hindi). At independence, Dalits and members of indigenous tribes were so oppressed that India's constitution put them on schedules for affirmative action. Quotas are set aside for employing members of scheduled castes and scheduled tribes in the public sector and for admitting them to universities in proportion to their shares in the population. Some states, such as Tamil Nadu, have employment and admission quotas for members of other backward castes.

against girls begins before birth—abortion, infanticide, and neglect contribute to a skewed gender balance, with only 933 females for every 1,000 males (Census of India 2001). This adds up to 20 million missing females. In recent years the gender balance has become even more skewed in the economically advanced states and Union Territories, such as Punjab and New Delhi, where readily available ultrasound technology can identify the gender of the fetus (Census of India 2001). The balance is also more skewed among children in the highest-spending households (measured by monthly per capita expenditure). The top 5 percent of rural households have 804 female children for every 1,000 male children (891 in urban households), compared with 946 female children in the bottom 5 percent (903 in urban households) (Siddhanta, Nandy, and Agnihotri 2005).

In 2001 75 percent of males and just 54 percent of females were literate (Census of India 2001). Rural women are twice as likely to be illiterate. Gender bias intersects with social exclusion: reaching girls from scheduled castes and tribes is particularly challenging.

This chapter reviews girls' enrollment and achievement, as well as the key factors contributing to gender and social gaps in India. It asks several questions:

- What are the barriers to girls' education? What accounts for the progress in narrowing gender and social gaps in enrollment and achievement in primary education (grades 1–8)?
- How large are the gender and social disparities in access to secondary education (grades 9–10)? Are some girls more vulnerable than others during the transition to secondary education?
- What determines achievement in secondary education?

The chapter draws on four datasets: the government's National Sample Surveys, the National Health and Family Surveys, the Sixth and Seventh All India Education Surveys, and two surveys of government and private secondary schools in Rajasthan and Orissa conducted by the authors in 2005. It also draws on the literature on Indian education and the Ministry of Human Resource Development's *Selected Education Statistics* and *Analysis of Budgeted Expenditure on Education*.

The chapter begins by reviewing girls' enrollment and achievement in primary school. It then describes gender and social gaps in access to secondary education and explores the reasons for the disparities. Next, it examines gender and social gaps in secondary certificate examination pass rates across states. It assesses the determinants of achievement in Rajasthan and Orissa and their policy implications. The last section suggests broader conclusions and policy implications.

Enrollment and achievement in primary school

India has made extraordinary progress in enrollment. In 2002 an estimated 25 million children (13 percent of the age cohort) were out of school (World Bank 2004). By

Table 5.1. Percentage of out-of-school children in India, by age group, 2005

	Age group		
Group	**6–10**	**11–13**	**6–13**
Males	5.5	7.5	6.2
Females	6.9	10.0	7.9
Rural	6.1	9.6	7.8
Urban	3.5	5.8	4.3
All	6.1	8.6	6.9

Source: Social and Rural Research Institute (2005).

2005 this number had been roughly halved, with only about 13.5 million children aged 6–13 (less than 7 percent of the cohort) out of school (Social and Rural Research Institute 2005).[2] The age-specific enrollment in primary education is nearly 94 percent. Another household study conducted by civic action groups finds similar enrollment rates (Annual Status of Education Report 2006).

About 8 percent of girls and rural children are not enrolled in school (table 5.1). These figures are higher than those for boys (6 percent) and for children from urban areas (4 percent). About two-thirds of these children have never attended school and a third of them have dropped out.

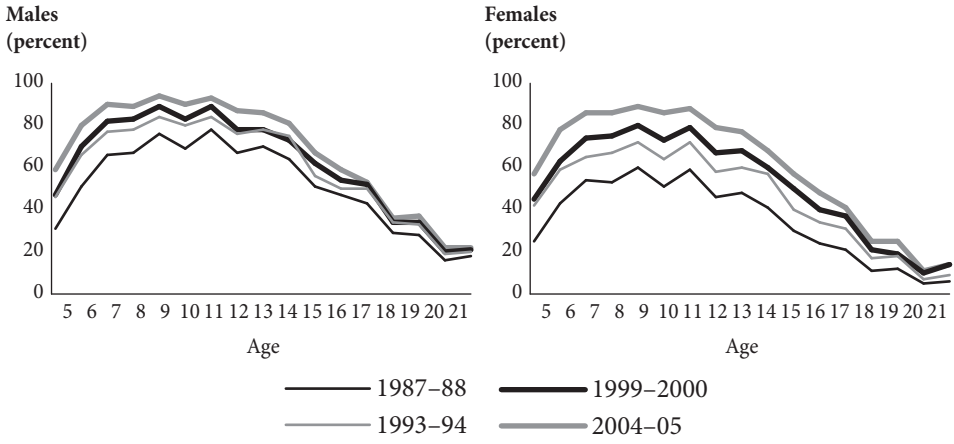
About half of all out-of-school children are physically or mentally challenged. Those out of school include 38 percent of children with disabilities, 10 percent of Muslim children, 10 percent of children from scheduled tribes, and 8 percent of children from scheduled castes.

Much progress has been made in extending access to primary school to girls, children from scheduled castes and tribes, and poor and rural children. Between 1987 and 2005, more children from all social groups entered the system earlier and stayed longer, and the increase in the enrollment of girls and previously excluded groups was higher than that of boys (figures 5.1 and 5.2). Children from the poorest quintile narrowed the gap with those from the top (figure 5.3), and rural children narrowed the gap with those from cities (figure 5.4).

But significant gaps still separate the general Hindu population from scheduled castes and tribes, other backward castes, and Muslims. These gaps are far greater among girls, with girls from scheduled tribes the worst off (figure 5. 5).

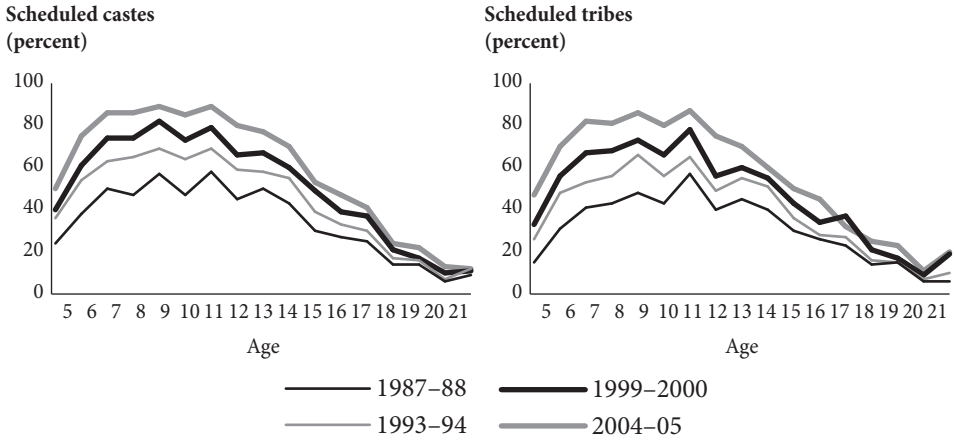
2 This sample-based household study was commissioned by the Ministry of Human Resource Development to validate the education status of school-age children. The survey was based on the sampling frame of National Sample Survey and so is nationally representative. Its findings are consistent with the state household surveys and with those of the Annual Status of Education Report 2006.

Figure 5.1. Age-specific enrollment rates by gender, 1987–2005



Source: India National Sample Surveys, 43rd , 50th, 55th and 61st rounds.

Figure 5.2. Age-specific enrollment rates of scheduled castes and tribes, 1987–2005



Source: India National Sample Surveys, 43rd, 50th, 55th, and 61st rounds.

What keeps girls out of primary school?

Both demand and supply factors affect access to school, particularly for girls and disadvantaged groups (King and Hill 1993; Lavy 1996; Alderman and Gertler 1997; Ravallion and Wodon 1999; Gertler and Glewwe 1992; Lloyd 2005). Students' academic performance and school retention and completion rates are affected by parental

Figure 5.3. Age-specific enrollment rates of richest and poorest expenditure quintiles, 1987–2005

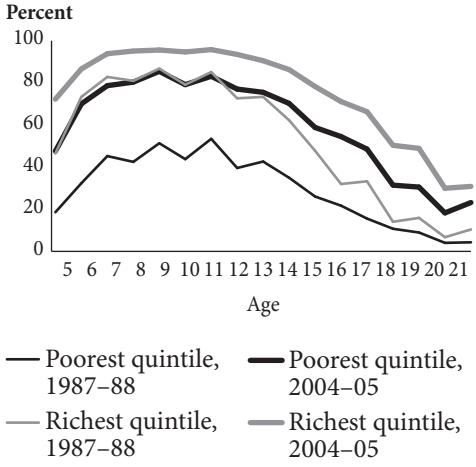
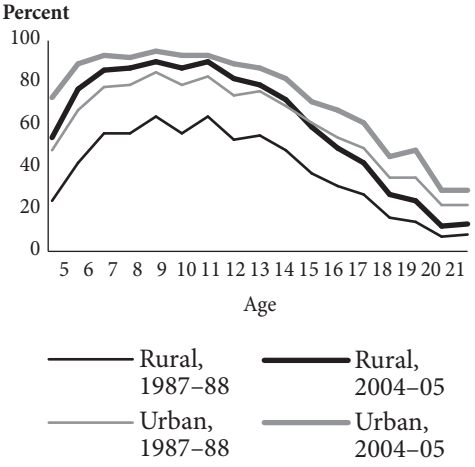
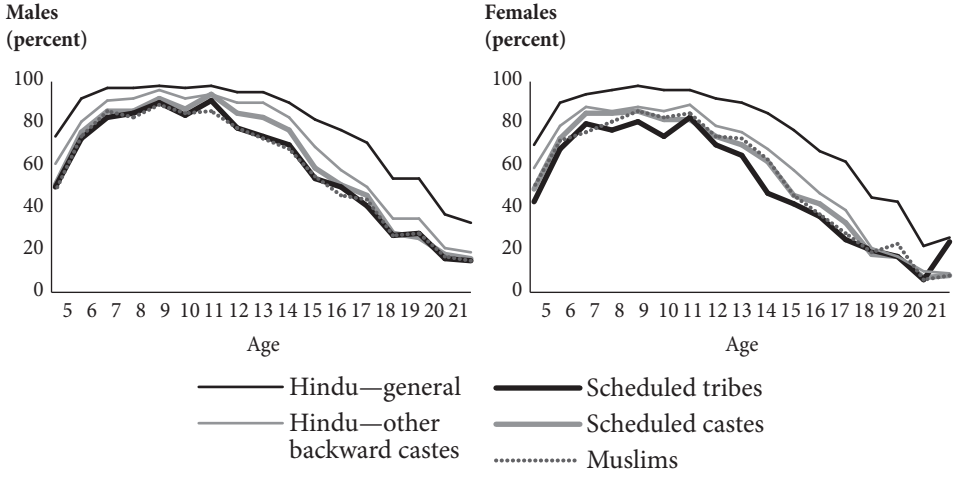


Figure 5.4. Age-specific enrollment rates in rural and urban areas, 1987–2005



Source: India National Sample Surveys, 43rd, 50th, 55th, and 61st rounds.

Figure 5.5. Age-specific enrollment rates of excluded groups, 2005



Source: India National Sample Survey, 61st round.

traits (educational attainment, involvement, and expectations), school traits (socio-economic, gender, and ethnic composition, the availability of teaching and learning materials, and teachers' content knowledge and pedagogical practices), and students'

schooling experience and prior learning (Lockheed and Verspoor 1991; Rumberger 1995; Jimerson 1999; Lloyd 2005).

Parental and social attitudes are major demand-side sources of gender inequality in India, but other factors are also important—the child's motivation, the household's ability to bear the costs of schooling, and the demand for the child's labor raising the opportunity cost (Sen 1992; Drèze and Sen 1995; Probe 1999; Kingdon 2002). Although government primary schools do not charge tuition, parents must pay for school uniforms, books, and transportation. The cost of these items can be prohibitive in poor households with many children.

Household chores, particularly sibling care in poor families, are a significant factor in girls' nonenrollment, frequent absence, and dropout. In the mid-1990s about 54 percent of girls (and 8 percent of boys) could not attend school because of sibling care (Probe 1999). That the proportion of out-of-school children is higher in the 11–13 age group than in the 6–10 age group suggests that the opportunity cost of schooling rises with age, as adolescents are more able to share the household burden or generate income. Culture can also play a role—as girls reach puberty, they may be kept out of school to seclude them.

In better-off states and cities where private schools thrive, a different type of inequality surfaces as education becomes more inclusive. Parents who do not want their children to learn in overcrowded classrooms or mix with children from low socioeconomic backgrounds send them to fee-charging private schools. Parents' aspirations for boys and girls differ, so more boys attend private schools, which are perceived to be better and often teach in English. Girls attend government schools, which charge no fees and teach in the regional language. The different treatment of girls in the intrahousehold allocation of resources worsens the gender gap, girls' achievement, and future job prospects (Kingdon 2002).

Both overt and subtle discrimination have contributed to the nonenrollment and dropout of children from scheduled castes (World Bank 1997). Teachers from higher castes tend to have low expectations for these children, and other students may also look down on them (Probe 1999; World Bank 1997). These expectations affect students' performance and motivation to remain in school. Hoff and Pandey (2004) asked 624 high- and low-caste students from grades 6 and 7 in Uttar Pradesh to work in groups of six to learn and perform a task (solving mazes). The castes of the students were revealed in the control group but not in the experimental group. There was no caste gap in the control groups, but the low-caste students performed worse than in the test group.

For scheduled tribes, often in dispersed groupings in remote areas, the distance to school is the key supply constraint. These areas also have difficulties recruiting teachers, and, even when teachers are posted, they face cultural barriers. Language adds to the problem, as the language of instruction is often not that spoken at home (Sujatha 2002). The lack of connection to the school contributes to absenteeism, underachievement, and dropout (World Bank 1997).

Rural children must be strong enough to walk the distance to school, leading to late enrollment, but primary school participation peaks at ages 9–10. The combination of late entry and early dropout means fewer years of education for students without a local school. For girls, particularly those at puberty, distance deters enrollment because of safety concerns.

Government action to narrow gender and social gaps in enrollment

Progressive public policy—through a partnership of national and state governments and civil society's movement for women's empowerment and inclusion—has transformed Indian education and society in the past two decades. Total public spending on education grew from less than 1 percent of GDP in 1950 to 3.8 percent in 2003, with primary education accounting for about half the total.

States bear the main responsibility for providing and financing education, but they vary considerably in their economic and social circumstances. A series of centrally sponsored initiatives have brought massive additional resources to equalize funding in primary education (Wu, Kaul, and Sankar 2005).

The most notable centrally sponsored scheme, begun in 1993, is the District Primary Education Program (DPEP), which intervened in half of India's 600 districts where female literacy was below the 1990 national average. It funds teacher training, instructional materials, and more schools and classrooms. The National Program for Universal Elementary Education of the 21st Century, which began in 2001, extends the DPEP nationwide, expanding the grades included from primary education (grades 1–5) to upper primary education (grades 6–8).

Under the National Elementary Education Program, the central government sets norms for planning and budgeting. Districts aggregate village plans and submit them to a central government board. After approval, funds are transferred for implementation by the states and districts, with community oversight. The goal of the National Elementary Education Program is to enable all children ages 6–14, including those with disabilities, to complete eight years of primary education of satisfactory quality by 2010.

The National Program for Universal Elementary Education increases funding for elementary education by about 10 percent through a cost-sharing arrangement, with 75–90 percent of funding from the central government and 10–25 percent from the states. Interventions to overcome access barriers focus on supply:

- Grants to schools for equipment, repair and maintenance, and learning and teaching materials.
- Grants to teachers for salaries, in-service training, learning resources centers, and teaching and learning materials.
- Grants for innovation.
- Grants to districts that support children with special needs.
- Grants for management, monitoring, and evaluation (Government of India 2001).

Interventions also address demand constraints for excluded groups, emphasizing public education and community oversight to change attitudes:

- Providing free textbooks to all girls and members of scheduled castes and tribes.
- Building toilets for girls.
- Hiring female teachers as role models.
- Creating residential bridge courses to help girls who have dropped out to reenter regular schools after six months.

The National Program for Education of Girls at Elementary Level (NPEGEL) supports subdistricts with female literacy below the national average, districts with at least 5 percent of the population coming from scheduled castes or tribes with female literacy below 10 percent, and districts containing selected urban slums. It mobilizes the community to target out-of-school girls, girls from marginalized social groups, and girls with low achievement. It also includes bridge courses for girls who have dropped out.

Other programs complement these initiatives. The Mid-Day Meal Scheme provides a daily hot meal to all children in government primary schools. An integrated child development service supports early childhood development. Preschools are attached to primary schools to lighten the burden of sibling care on older children and to improve school readiness.

States also supplement national interventions with their own programs. Madhya Pradesh provides free uniforms to all girls in grades 1–8, substantially raising their status. State tribal development departments fund stipends and scholarships for children from scheduled tribes, although coverage remains partial.

Student achievement in primary education

Increased access to primary education has not led to higher student achievement. An assessment of 88,000 fifth-grade students in government schools, covering 30 states and Union Territories, found that the average student responded correctly to just 45 percent of mathematics questions and 58 percent of language questions (National Council of Education Research and Training 2003). Although gender differences in average scores and standard deviations were small, there were gender variations across states, particularly in the Hindi heartland, which has stronger male preferences (table 5.2).

According to the Annual Status of Education Report 2006, many teens cannot read or solve numerical problems supposedly mastered in the early primary grades (table 5.3).[3] Students who attend private schools scored 11 percentage points higher than

3 In 2005 citizen action groups, under the leadership of Pratham (a nongovernmental organization), tested some 600,000 children in 240,000 rural households in 525 districts (of about 600) to monitor the progress of the Elementary Education Program. The first Annual Survey of Education Report documented the results.

Table 5.2. Achievement of fifth-grade students, by gender and area, 2002

		Rural		Urban		Total	
Subject	Gender	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Mathematics	Boys	46.72	21.11	47.36	21.53	46.90	21.24
	Girls	45.54	21.21	47.29	21.61	46.09	21.35
	Total	46.15	21.17	47.32	21.57	46.51	21.30
Language	Boys	57.95	18.00	61.36	18.43	58.94	18.19
	Girls	57.37	18.18	61.89	18.51	58.79	18.41
	Total	57.67	18.09	61.63	18.47	58.87	18.30

Source: National Council of Educational Research and Training (2003).

Table 5.3. Deficiencies in reading and numeracy among primary-school-age children in rural India, 2005

	Percentage of children who cannot read		Percentage of children who cannot solve numerical problems	
Age	Short paragraphs with short sentences	Story text with long sentences	Subtraction or division	Division only
7–10	48	68	54	80
11–14	17	31	24	47

Source: Annual Status of Education Report (2006).

those attending government schools. The study did not examine gender differences in test scores, and the public-private differences did not adjust for selection bias.

What factors affect student achievement in primary education? Studies found a positive correlation between student test scores and parents' education and fathers' occupation (Govinda and Varghese 1993; Saxena, Singh, and Gupta 1995). The test scores of primary school students from the highest and lowest consumption quartiles differed by a a third of a standard deviation on average—equivalent to an additional year of schooling (World Bank 1996).

Hierarchical linear modeling[4] of the DPEP's data shows that differences among schools account for 20–60 percent of math achievement variation and 14–45 percent of reading achievement variation across states. Differences in students' family backgrounds

4 Hierarchical linear models are relevant in analyzing data that present a clustered structure with unequal sampling probabilities. These data are commonly found in educational systems, where students are typically nested within classrooms and schools (Raudenbush and Bryk 2002). A multilevel analytical approach can examine whether similar students might have different learning outcomes if they attended classrooms with different characteristics.

account for the rest (World Bank 1996). The family's allocation of time at home for study, their encouragement of reading, and their support of their children's educational aspirations have positive effects on student achievement. Student outcomes are also positively correlated with school-level inputs—the existence of standards, textbooks, and teaching materials, better curricula, infrastructure, pedagogical content knowledge, teaching practices, academic climate, and more opportunities to learn, created by encouraging regular attendance, increasing time on task, and assigning homework (World Bank 1996).

Despite the huge investment, the basic requirements for learning are not present in all schools. Teacher hiring often lags behind student intake. In Bihar, the average pupil-to-teacher ratio was far above recommended guidelines (40:1) at 78:1 in 2005, with a minimum of 58:1 and a maximum of 208:1 (Ministry of Human Resource Development 2006). By comparison, in Andhra Pradesh the average was 28:1, with a minimum of 22:1 and a maximum of 34:1.

Simply adding inputs will not raise student learning if the system lacks incentives and accountability—this is the message of recent research (Hanushek 2003; Glewwe, Ilias, and Kremer 2003; Pritchett 2004; Vegas 2005). In India, the World Bank (2003) found a teacher absence rate of 25 percent—higher than in Peru (13 percent) and Zambia (17 percent) and only slightly lower than in Uganda (27 percent). Another 25 percent of teachers were engaged in non-teaching activities in school. Absence varied within India, ranging from of 15 percent in Gujarat to 39 percent in Bihar. Men and senior teachers had more absences, while schools with better infrastructure and transportation had fewer (Kremer and others 2005). Student absence was also high—61 percent in Bihar. Teachers and students in government schools had higher absence rates than those in private schools.

But service delivery can be improved, as recent randomized studies have shown (Banerjee and Duflo 2005; Duflo 2005). In rural Udaipur—with teacher absence as high as 44 percent—teachers in an experimental group were given a tamper-proof camera to photograph themselves with their students at the beginning and end of each day. They received a bonus for the number of days of proven presence with a minimum number of students. Teachers in the control group also received a bonus and were told that they could be dismissed if they were absent, but there was no proof-of-presence requirement. Unannounced visits found that teacher absence fell dramatically in the treatment group to 24 percent, compared with 43 percent in the control group. Student test scores increased by 0.17 standard deviations in the treatment group (Duflo and Hanna 2005).

In India's Andhra Pradesh, a study gave bonuses to teachers for the average improvement in student scores on independently administered tests. Students in "incentive" schools outperformed those in control schools in math tests (0.19 standard deviations) and language tests (0.12 standard deviations) (Muralidharan and Sundararaman 2006).

Similar randomized methods have shown that changing teaching methods can improve achievement. In Mumbai and Vadodara, low performing primary school

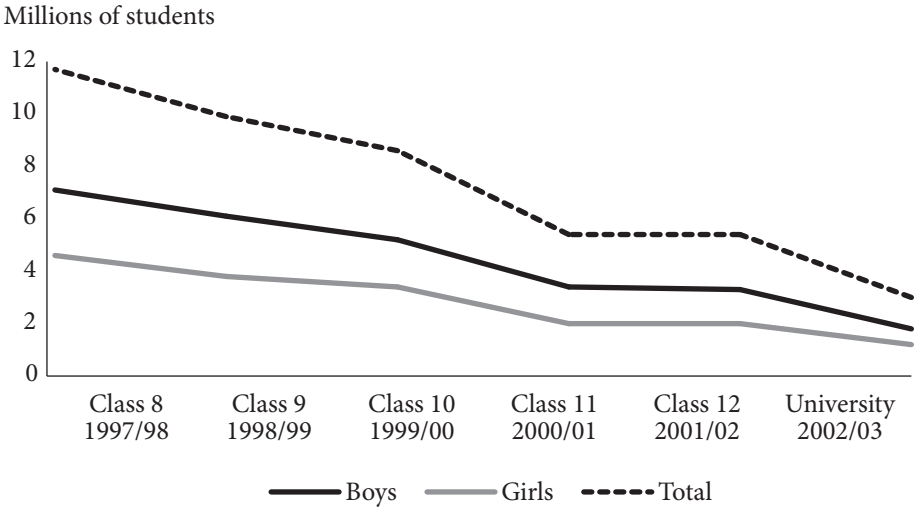
students in government schools were removed from class for half the day and given individualized, non-threatening remedial education in literacy and mathematics by community women. To reinforce their mathematics skills, they played games using a computer-assisted learning program. Literacy scores increased by 0.14 standard deviations in the first year and 0.28 in the second year. Mathematics scores increased by 0.36 standard deviations in the first year and 0.54 in the second year (Banerjee and others 2004).

These studies show that service delivery and student outcomes can be improved. Future research can explore how to improve teacher and student incentives to close the gender gap.

Gender and social disparities in access to secondary education

With elementary education approaching universal coverage, attention now focuses on the long-neglected problems of secondary education. The gross enrollment rate in secondary school (grades 9–12) is under 40 percent—and even lower for girls, Muslims, and children from scheduled castes, scheduled tribes, and other backward castes. Girls account for less than 40 percent of secondary enrollment, while middle-class, urban boys are overrepresented. About 6 percent of children from scheduled castes

Figure 5.6. Transition from primary to secondary, upper-secondary, and university for boys and girls



Source: Government of India, Selected Education Statistics, various years.

Table 5.4. Enrollment in grades 9–12, by gender and location, 1993 and 2002 (percent)

	Urban			Rural		
Year/grades	Total	Boys	Girls	Total	Boys	Girls
1993						
Grades 9–10	62	37	25	38	27	11
Grades 11–12	49	29	20	51	35	16
2002						
Grades 9–10	54	31	22	46	27	19
Grades 11–12	58	32	25	42	26	16

Source: Government of India (1993, 2002).

Table 5.5. Household expenditures on education, 1995/96 (Indian rupees)

	Expenditure quintile					School type			
	Q1 (poorest)	Q2	Q3	Q4	Q5 (richest)	Governmental and local bodies	Private aided	Private unaided	Average
Primary	200	309	425	605	1,161	269	1,186	1,431	507
Upper primary	426	586	729	907	1,554	639	1,350	2,159	921
Secondary	693	858	1,000	1,278	1,950	1,058	1,565	2,759	1,333
Senior secondary	1,133	1,372	1,462	1,853	3,067	1,831	2,553	3,698	2,257
Tertiary	1,381	1,669	1,897	2,329	4,048	2,683	3,416	5,509	3,164

Note: Data represent most recent data available.

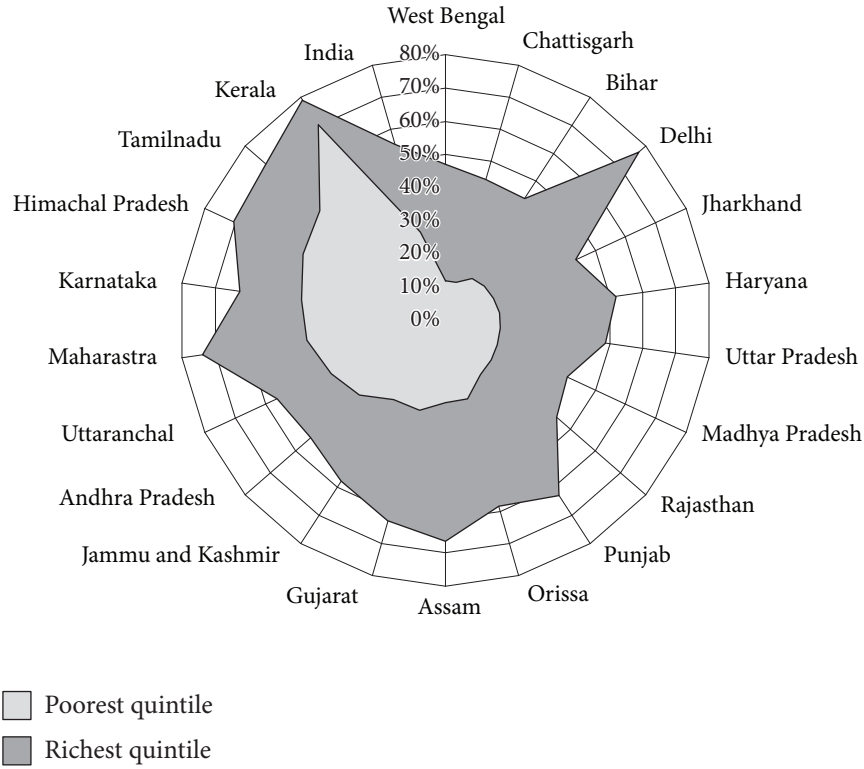
Source: India National Sample Survey, 52nd round.

and 3 percent from scheduled tribes enroll, far below their shares in the population. The gender gap is also larger than in primary schools (figure 5.6).

Safety concerns make distance an important obstacle to girls' enrollment. Only 65 percent of villages have a secondary school within the official guideline of five kilometers (Seventh All India Educational Survey 2002). Beyond five kilometers, walking to school takes more than an hour, particularly without roads, deterring enrollment or regular attendance.

Although more than 70 percent of the population lives in rural areas, rural enrollment accounts for only half of total enrollment. Girls account for a much smaller share of enrollment in rural areas than in urban areas (table 5.4).

Figure 5.7. Net secondary enrollment rates for secondary and upper secondary schools across different states, by richest and poorest quintiles, 1999/2000



Source: National Sample Survey, 55th round.

Parental and societal preferences for single-sex secondary schools create another barrier. In more traditional states, such as Rajasthan, boys and girls attend separate secondary schools. Only about 7 percent of Rajasthan's secondary schools and 15 percent of its senior-secondary schools are accessible to girls. As a result, Rajasthan boys made up 71 percent of students in secondary and senior-secondary schools in 2003/04 (Wu and Sankar 2005).

Because government funding has focused on primary education, expansion in secondary education has occurred through growth in private schools. Secondary education, unlike primary education, is not a constitutional right. So family costs for secondary schooling—for tuition, examinations, uniforms, textbooks, stationery, transportation, and private tutoring—are twice those for primary education (table 5.5). The

costs of senior-secondary education are four times as large. School fees constitute only part of the cost; examination, uniforms, transport, and private tuition account for other costs (see annex table 5A.1 for details). Private secondary schools without any government support cost three times as much as public secondary schools per student (table 5.5).

The differential access to secondary education across household expenditure quintiles is striking (figure 5.7). It suggests that households' inability to bear the cost of schooling is a major constraint on enrollment.

What determines student achievement in secondary school?

School-leaving exams test student achievement in India's secondary schools. Girls constituted only 36 percent of those who stood for the school-leaving examinations after grade 10 in 2001 (Government of India 2001, 2002). They accounted for less than a third of test-takers in Hindi-speaking states in northern and central India (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh), Punjab, and Andhra Pradesh. The number of girls exceeded the number of boys only in Kerala and Manipur.[5]

Girls outperformed or equaled boys in pass rates in many states; they had lower pass rates in Punjab, West Bengal, Orissa, and, particularly, in Jammu and Kashmir. Selection effects may have played a role in the gender differences or lack thereof (table 5.6).

In states with low gross secondary enrollment rates (30–40 percent), usually the poorer states, students come mainly from middle-class families. In states with secondary gross enrollment rates above 50 percent, the student body is more heterogeneous, with more students from scheduled castes, scheduled tribes, and other backward castes.

Little is known about what determines secondary school achievement. A World Bank study (2002) in the southern state of Karnataka, with secondary enrollment of more than 50 percent, finds that passing the grade-10 examination is correlated with higher levels of father's and mother's education, better libraries and laboratories in school, lower pupil-teacher ratios, attending an English language primary school, and private tutoring. The failure rate was higher for students from scheduled castes whose parents had no education and did not speak English. No gender effects were evident. The determinants of passing the examination at the end of grade 12 are similar, with added positive effects for urban location and being female and negative effects for being from a scheduled caste or tribe.

5 Appearance and pass rates are not comparable across states because different states have their own board examinations, and there are also central boards for specific types of schools. There is no uniform standard applicable nationwide, nor has any test been benchmarked against any international studies to calibrate relative standards.

Table 5.6. Performance by boys and girls on secondary school-leaving certification examination, by state, 2000

	Percentage that took exam		Percentage that passed exam	
State/school system	**Girls**	**Boys**	**Girls**	**Boys**
Andhra Pradesh	35.3	64.7	49.3	44.6
Bihar	28.2	71.8	44.5	34.9
Central Board of Secondary Education, New Delhi	42.5	57.5	64.4	64.2
Council for Indian School Certificate (Central Board)	42.5	57.5	94.9	93.1
Gujarat	38.9	61.1	44.9	37.3
Haryana	36.0	64.0	55.8	50.6
Jammu and Kashmir	46.1	53.9	25.0	46.1
Karnataka	41.8	58.2	48.3	43.2
Kerala	53.2	46.8	51.9	49.7
Madhya Pradesh	28.9	71.1	42.1	32.8
Maharashtra	37.9	62.1	47.5	40.6
Orissa	39.7	60.3	52.7	53.5
Punjab	35.1	64.9	57.6	62.2
Rajasthan	25.7	74.3	50.7	45.7
Tamil Nadu	45.6	54.4	72.0	65.1
Uttar Pradesh	26.0	74.0	69.6	40.3
West Bengal	39.1	60.9	58.4	64.1
Total	35.7	64.3	52.3	43.6

Source: Board of Secondary and Higher Secondary Education in India reported in Government of India (2001, 2002).

To understand what determines achievement in states with limited opportunities for secondary education, we surveyed private and public secondary schools in Rajasthan and Orissa in 2005. Per capita income in these states is below the national average, and enrollment is less than 40 percent.[6]

6 Rajasthan is on the border of Pakistan, and about half of its land is desert. It has a population of 56 million and a per capita state gross domestic product (SGDP) of $312 in 2002. Rajasthan culture is strongly influenced by that of the warrior-ruler class, emphasizing honor and gallantry, with a strong preference for men. Orissa is on the coast of the Bay of Bengal. It has a population of 37 million and an SDP of $245. Orissa has a more equal society. Compared to India's Gross Domestic Product (GDP) of nearly $600, both states are poor. They also have large tribal populations—12.6 percent in Rajasthan and 22.1 percent in Orissa—much higher than the 8.2 percent nationally. Scheduled castes are 17.2 percent of the population in Rajasthan and 16.5 percent in Orissa, slightly above the national average of 16.2 percent.

The sample comprised 3,418 grade 9 students in 144 schools in Rajasthan and 2,856 students in 109 schools in Orissa—from government schools, privately managed schools receiving public aid, and unaided private schools.[7] Students were selected randomly, with a maximum of 30 from each school. The survey included a 90-minute math test to measure learning outcomes.[8] It administered separate questionnaires to students, math teachers, and principals. The student questionnaire collected data on student characteristics (gender and social composition, age, disability), family background (parental educational level, home resources), schooling experience (preprimary and primary school enrollment, repetition and dropout, absence, private tutoring, school resources), parental expectations, the opportunity to learn (new lessons, questions, homework, and tests),[9] and work outside school. The math teacher questionnaire asked about gender, age, professional qualifications and experience, terms and conditions of service, and perception of student performance. The principal questionnaire collected data on school characteristics, such as enrollment, repetition, and dropout rates, school resources, and management practices.

In both states average scores were low and standard deviations high. Girls performed better than boys, except those from other backward castes (table 5.7).

We used hierarchical linear models to address two questions. Does the gender gap persist after controlling for student background, teacher characteristics, school resources, and school type? Do the factors contributing to student performance vary by state, or are some factors common to both?

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7 Sampling began by selecting three districts randomly within each of the three socio-cultural regions (SCR) in each state. The schools were distributed between rural and urban areas by their share in the total number of schools. The number of schools in the government, private aided, and private unaided sectors was selected by two criteria: the distribution of total schools by school type and the distribution of schools by secondary only (grade 9).

8 The items were selected from a sample of published items from the Third International Mathematics and Science Study (TIMSS) for grade 8. The test primarily assessed general math content knowledge of data representation and analysis, fraction and number sense, algebra, geometry, and measurement. The math test comprised 36 items. Although the original TIMSS populations were the eighth grade, in Rajasthan, grade 8 is the last year of elementary education, and grade 9 is the beginning of secondary education. Although secondary education begins in Orissa in the eighth grade, to apply the test to the same grade in both states, the TIMSS eighth grade test was applied to the ninth grade in both Rajasthan and Orissa, but with more difficult items from the TIMSS tests chosen to adjust for the grade difference. The tests were shown to teachers, students, and state-level officials to ensure that they were within the curriculum.

9 The opportunity to learn is measured by asking the following questions: how is a new chapter introduced (whether the focus of the lesson is clear, whether the class discusses a practical problem, whether the class solves related examples, and whether students look at the textbooks)? How is a lesson being taught in class (whether the teacher encourages questions, whether teaching methodology is stimulating, whether the class solves problems together, whether students copy notes from the board)? How does the teacher give and check the homework and tests in class (whether the teacher gives and checks homework, whether the teacher provides feedback on homework, whether the teacher explains examination rules)?

Table 5.7. Math performance in Rajasthan and Orissa 2005, by location, school type, and gender (percent questions correct)

	Rajasthan				Orissa			
	Urban		Rural		Urban		Rural	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Government schools								
Mean	30.2 (14.2)	31.6 (15.5)	27.6 (9.5)	28.7 (11.7)	36.8 (18.5)	39.9 (18.5)	34.8 (14.8)	32.7 (17.2)
Private aided schools								
Mean	33.4 (11.4)	37.9 (11.5)	—	—	39.7 (16.2)	30.4 (11.2)	39.3 (15.4)	36.9 (15.0)
Private unaided schools								
Mean	39.1 (14.7)	36.7 (15.5)	46.7 (19.9)	48.4 (20.8)	35.5 (16.9)	41.2 (17.7)	40.5 (19.5)	37.6 (19.3)

— indicates data not available.

Note: Mean scores are not weighted. The results cannot be generalized to the state as a whole. Standard deviations presented in parentheses. Sample size provided in table 5A.2.

Source: Authors' survey of student achievement described in text.

Separate analyses were conducted for Rajasthan and Orissa to identify the models that best explain the data and to investigate regional differences in achievement. In Rajasthan about 54 percent of the variation is attributable to differences among schools, and the rest to differences among students. In Orissa, school and student differences each contribute roughly 50 percent.

Gender, mother's education, parental expectations, and previous performance in math are significantly associated with achievement in both Rajasthan and Orissa, although the predictive power of these characteristics varies among states (tables 5.8 and 5.9).

In Rajasthan, girls scored an average of 3.7 percentage points below boys, accounting for other factors. However, the gender gap varies significantly across schools. Girls attending classes taught by female teachers scored about 1.1 points higher than their male classmates. In Orissa girls scored an average of 1.9 percentage points below boys.

In both states coming from a scheduled caste or tribe did not directly affect achievement after controlling for family background. This is likely due to selection effects—only the highest performers in those groups entered secondary school. However, parents of students from scheduled tribes were less able to provide academic support.

In Rajasthan home resources aggregated at the school level (not at the individual level) seemed to be associated with performance. Students performed worse in schools

Table 5.8. Student- and classroom-level results of the hierarchical linear model for grade 9 math performance in Rajasthan

	Coefficient	*t*-statistic	Effect size
Grand mean	33.01		
Student variables impacting student performance			
Student characteristics			
Female (vs. male students)	–3.72	–3.22**	–0.25
Between-classroom effects on the gender gap			
Basic home resources	–2.87	–2.76**	–0.35
Advanced home resources	4.49	2.82**	0.35
OTL 1: introduction to new concepts	0.90	2**	0.20
OTL 2: lessons	–0.93	–2.74**	–0.22
Teacher characteristics			
Female	4.86	2.42**	0.32
Duration of the class	0.53	2.54**	0.24
Preparation time	0.52	2.44**	0.20
Teacher perceptions: students have inadequate materials at home	–1.53	–2.91**	–0.21
School characteristics			
Private aided school (vs. public)	7.80	2.84**	0.52
Urban school (vs. rural)	–6.40	–3.72***	–0.43
General school resources	–1.31	–3.3**	–0.29
Specific school resources	2.40	2.38**	0.27
Scheduled tribe effect	–0.86	–1.55	
Between-classroom effects on achievement gap between scheduled tribes and other students			
School size (proxy = number of secondary teachers)	–0.36	–2.48**	–0.18
Family background			
Basic home resources	1.36	1.16	
Additional impact of OTL 3 (homework and exams) on basic home resources	–0.14	–2.51**	–0.49
Advanced home resources	–0.59	–0.27	
Additional impact of OTL 1 (new topics) on advanced home resources	–0.26	–2.53**	–0.63
Additional impact of OTL 2 (lessons) on advanced home resources	0.21	2.33**	0.51
Number of siblings	–0.28	–2.5**	–0.06

	Coefficient	*t*-statistic	Effect size
School experience			
Time to school (minutes)	–0.03	–2.43**	–0.06
Commute to school via school bus	–3.20	–3.02**	–0.21
Receive mathematics tutoring	–1.79	–2.4**	–0.12
Language grades	0.07	3.22**	0.10
Mathematics grades	0.12	5.68***	0.19
Parent involvement			
Parent expectations (compared with senior secondary or less)			
Certificates	1.70	2.83**	0.11
BA or professional degree	1.92	3.44**	0.13
Postgraduate degree	1.27	2.03**	0.08
Opportunity to learn			
OTL 3 (homework and exams)	0.41	2.19**	0.13
Work experience			
Household chores	0.07	2.54**	0.07
Classroom aggregate student variables impacting classroom performance			
Basic home resources	5.62	2.89**	0.68
Language grades	–0.40	–3.29**	–0.32
Teacher variables impacting classroom performance			
Teacher perceptions: students lack family support	–1.97	–2.33**	–0.23
Teacher perceptions: students' school supplies	1.26	2.06**	0.18
Teacher perceptions: need training—subject matter	2.39	1.94*	0.17
Teacher perceptions: need training—teaching skills	2.57	2.28**	0.19
School variables impacting classroom performance			
Percent completing 9th grade	0.14	2.71**	0.30
Private aided school	6.18	2.23**	0.41
Private unaided school	10.62	3.14**	0.71
Urban school	–4.83	–2.19**	–0.32
School resources	–2.07	–2.16**	–0.23

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Source: Authors' survey of student achievement described in text.

Table 5.9. Student- and classroom-level results of the hierarchical linear model for grade 9 math performance in Orissa

	Coefficient	*t*-statistic	Effect size
Grand mean	36.57		
Student variables impacting student performance			
Student characteristics			
Female (vs. male students)	–1.9	–2.18*	–0.11
Family background			
Mother education level—graduation degree	3.89	1.92*	0.22
Basic home resources	0.21	0.92	
School experience			
Attended preprimary school	1.60	1.93*	0.09
Hours of private tutoring	0.11	3.46**	0.12
Language marks	0.10	3.86**	0.20
Mathematics marks	0.17	7.69**	0.34
Parent expectations and involvement			
Diploma	2.93	2.86**	0.17
BA	2.01	2.08*	0.11
Postgraduate degree	2.07	1.89*	0.12
Parent check homework	–0.08	–0.77	
Teacher variables impacting classroom performance			
Highest level of teaching training: B.Ed.	5.62	1.86	0.32
Classroom aggregates of student variables			
Average class marks on mathematics	0.34	2.71**	0.37
School variables impacting classroom performance: not applicable			

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: For continuous variables the effect sizes are calculated as the effect of a characteristic for a student who is one standard deviation above average on that characteristic, compared with a student who is one standard deviation below average on that characteristic, divided by the standard deviation of the outcome. For dichotomous variables, the effect size equals the differences between a student who has that characteristic and one who does not—that is, the coefficient estimate divided by the standard deviation of the outcome. Effect sizes are considered small when less than 0.2, and moderate to about 0.4, and large above 0.6.

Source: Authors' survey of student achievement described in text.

where students lack home resources. A positive association between individual home resources and student performance was found in Orissa.

Did school type matter? It did in Rajasthan, but not in Orissa. Rajasthan students from private unaided schools outperformed those from other school types. Students from government schools performed worst, accounting for student and teacher characteristics (table 5.9). Urban schools performed significantly worse than rural schools, holding everything else constant. So parent decisions to send boys to private schools and girls to government schools affect achievement.

Although the gender gap remained in both states—boys outperformed girls—increases in opportunity to learn seemed to help. A good introduction to new concepts by teachers narrowed the gap, suggesting an important new strategy. But the teaching has to fit girls' learning style, or it could further exacerbate gender inequalities. The gender of the teacher also had a strong effect on girls' mathematics performance.

Conclusions and policy implications

India has made impressive progress in narrowing gender and social gaps in primary education. Progressive policy, sustained public financing, and civil society's determination have contributed to the improvement. But the persistent achievement gaps in secondary education—between boys and girls and across subgroups—underscore the need to reassess educational policies affecting underrepresented groups.

The implications for policy are clear. First, India must complete the task of bringing primary education to all. With only 7 percent of children now out of school, the government must deal with the most marginalized and hard to reach. Targeted demand-side interventions addressing the needs of each subgroup are needed to bring all children into the school system—and keep them there.

Second, India must raise student achievement in primary schools. Without a solid foundation, girls and other marginalized groups cannot compete at the next level, and they lose out in the labor market. Early childhood interventions can improve school readiness, compensatory education, and language instruction for students whose first language is not that used in school. More and better teacher education and in-service training are essential to address girls' learning needs.

Third, to achieve gender and social parity in secondary education, India must improve its public schools. Because parents are reluctant to pay to send their daughters to private schools, improving government schools will give girls from poor or disadvantaged backgrounds a better chance to succeed. Although using vouchers and stipends is an option where the supply of private schools is sufficient, this alternative is unrealistic in remote, rural areas. Government schools remain the provider of last resort for marginalized groups.

Annex to Chapter 5

Table 5A.1. Household expenditures on secondary education by category of spending, 1995/96 (Indian rupees)

	Expenditure quintile					School type			
	Q1 (poorest)	Q2	Q3	Q4	Q5 (richest)	Governmental and local bodies	Private aided	Private unaided	Average
Secondary									
Tuition fee	193	278	309	423	807	197	553	1,138	549
Examination	67	58	58	67	85	64	71	113	70
Other fees	76	79	96	115	165	89	148	299	121
Books	198	214	223	231	296	236	251	315	246
Stationery	118	141	152	175	219	163	187	227	175
Uniforms	270	294	318	358	437	350	371	458	366
Transportation	190	197	302	338	476	333	378	560	379
Private tuition	520	559	628	832	1103	734	992	1195	865
Other expenses	67	87	93	117	156	107	129	177	118
Total expenditure	693	858	1,000	1,278	1,950	1,058	1,565	2,759	1,333
Senior secondary									
Tuition fee	264	321	343	437	1030	335	833	1592	701
Examination	94	99	108	121	132	118	111	174	120
Other fees	176	145	188	212	307	186	282	480	242
Books	286	335	334	381	463	389	408	460	402
Stationery	173	194	195	218	285	227	248	287	240
Uniforms	438	343	393	445	554	462	491	592	480
Transportation	309	369	341	412	598	437	569	532	501
Private tuition	733	950	1,021	1,178	1,956	1,356	1,793	1,674	1,571
Other expenses	101	136	150	166	231	171	188	322	188
Total expenditure	1,133	1,372	1,462	1,853	3,067	1,831	2,553	3,698	2,257

Source: India National Sample Survey, 52nd round.

Table 5A.2. Number of observations associated with means in table 5.7

	Rajasthan				Orissa			
	Urban		Rural		Urban		Rural	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Government schools	339	149	976	432	152	117	573	488
Private aided schools	119	66	—	—	86	65	144	101
Private unaided schools	582	391	282	82	110	44	475	501

— indicates data not available.

Source: Authors' survey of student achievement described in text.

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6 *Indigenous girls in Guatemala: Poverty and location*

Kelly Hallman and Sara Peracca, with Jennifer Catino and Marta Julia Ruiz

Although enrollment rates are increasing in Guatemala, educational attainment continues to be among the lowest in Latin America as a result of late entry, repetition, and early dropout. Vast inequalities in access and attainment—linked to ethnicity, gender, poverty, and geography—remain. Adult literacy, estimated at 85 percent in Latin America, is just 70 percent in Guatemala (UNDP 2004).

While indigenous peoples generally have less schooling than nonindigenous peoples throughout Latin America, ethnic differences are greatest in Guatemala, where indigenous adults have less than half the schooling of nonindigenous adults (2.5 years of education compared with 5.7 years) (Hall and Patrinos 2005). Recent trends show the ethnic gap narrowing among younger people, but large inequalities remain. Among 10- to 19-year-olds, the indigenous literacy

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rate is 82 percent that of nonindigenous people (74 percent compared with 90 percent) (Shapiro 2005).

Gender differences in literacy and education are also large in Guatemala. The female-to-male literacy ratio is 0.77 among adults and 0.86 among 15- to 24-year-olds. Although the girl-to-boy primary enrollment ratio of 0.95 in 2000 indicates great improvements, the gender ratio of primary completion for 15- to 24-year-olds is substantially lower, at 0.82 (INE 2000).

Indigenous females are by far the most disadvantaged group. Only 39 percent of 15- to 64-year-old indigenous women are literate (compared with 68 percent of indigenous males, 77 percent of nonindigenous females, and 87 percent of nonindigenous males), and just two-thirds of 10- to 19-year-old indigenous females are literate (compared with 80 percent of indigenous males and 90 percent of nonindigenous females and males) (Shapiro 2005).

To address the unequal status of indigenous peoples worldwide, the UN General Assembly proclaimed the International Decade of the World's Indigenous Peoples in December of 1994. At the end of that decade, the situation of indigenous peoples relative to their nonindigenous counterparts in Latin America had not changed greatly—and in some cases it had gotten worse (Hall and Patrinos 2005). In the five Latin America countries with large indigenous populations (Bolivia, Ecuador, Guatemala, Mexico, and Peru), poverty rates for indigenous people did not change markedly in those 10 years. Guatemala is the only country where the rate of poverty fell for indigenous people, and there it fell less than it did among nonindigenous people (declines of 14.2 percent for indigenous people compared with 25.7 percent for nonindigenous people).

Indigenous people make up 42 percent of Guatemala's population. They reside primarily in rural areas and are politically underrepresented and very poor. Three-fourths of indigenous people and 40 percent of nonindigenous people in Guatemala are poor (INE 2000). Three-quarters of the rural population live in poverty, compared with 32 percent of the urban population. The richest 10 percent of the population receives 48.3 percent of all income (UNDP 2004). Being indigenous leads to at least a 10 percent greater likelihood of being poor in Bolivia, Ecuador, Guatemala, Mexico, and Peru (Hall and Patrinos 2005).

Indigenous people face many barriers. Not only do they have lower levels of educational attainment, but they also gain lower returns than nonindigenous people for each year of schooling attained (Hall and Patrinos 2005). These lower returns are believed to be due to lower quality education, longer periods of unemployment, and discrimination in wages and access to jobs. Indigenous females in Guatemala are particularly disadvantaged in earning potential due to low levels of education and geographic- and gender-related cultural barriers that limit access to jobs (Steele 1994). Lack of Spanish literacy is believed to be another impediment to their earning potential, social participation, and overall well-being (Stromquist, Klees, and Miske 1999).

Guatemala experienced 36 years of civil unrest, which left few resources for social programs, including education. Although conditions are slowly improving, school enrollment remains low overall and unequal by gender and ethnicity. Since the 1996 peace accords, the government has declared education critical to achieving equity, national unity, economic modernization, and international competitiveness (Andersen 2001). It has recognized the disadvantages of ethnic minorities and girls and set a goal of promoting primary enrollment and grade completion among these groups.

Various pilot programs have been tried and shown to be effective, including the scholarship program targeted at rural girls in the early 1990s (Stromquist, Klees, and Miske 1999). Most have had limited impact, however, because they have not been implemented countrywide. Some are expensive, and government support has not been consistent. Recently, the government has focused on increasing primary enrollment in rural areas, with the main initiatives designed to increase the availability of bilingual education. These efforts have reportedly raised rural enrollments (Andersen 2001).

Government expenditure for education remains consistently low in Guatemala, at less than 2 percent of GDP. This figure compares poorly with the 3.6 percent average for Latin America and the 4.6 percent average for the lower middle income group of countries to which Guatemala belongs (Edwards 2002). The U.S. Agency for International Development reports, however, that the Berger administration has identified social investment, including education, as one of the main contributors to the national goal of employment and well-being for all Guatemalans and that gains are starting to be achieved at the national policy level (USAID 2005).

Data used

This chapter uses nationally representative data to examine the educational situation of young people in Guatemala, comparing indigenous females with indigenous males and with nonindigenous females and males. While several studies have been conducted on this topic (for example, Shapiro 2005; Edwards 2002; Steele 1994), most do not include a systematic examination of both the distinct and the interactive effects of ethnicity, gender, poverty, and geography. This has limited our understanding of the underlying causes of variations in educational opportunities and achievement. Our approach analyzes these factors and their interactions, enabling specific recommendations about how policies and programs can be more appropriately targeted to address educational inequalities.

We use the 2000 Guatemala Living Standards Measurement Survey—in Spanish, *Encuesta Nacional Sobre Condiciones de Vida* (ENCOVI)—to examine the determinants of school enrollment, progression, and educational attainment among 7- to 24-year-olds. We start at age 7, since this is the compulsory age of primary school enrollment in Guatemala and corresponds to the lower age threshold for which the

ENCOVI asked respondents about schooling.[1] By age 24 most Guatemalans have finished their schooling, so we use this as the upper age limit for our analysis. The survey includes a detailed consumption/expenditure module, which allows poverty levels to be calculated. The National Institute for Statistics collected the data between 1999 and 2000. The sample is nationally representative and consists of 11,170 households (3,544 urban and 7,626 rural).

We examine differential patterns of school enrollment, including whether children were ever enrolled in primary school, their age at school entry, whether they were ever enrolled in secondary school, their reasons for nonenrollment, and their school-work status. For females we also model the possible co-related outcomes of enrollment and marriage using a bivariate probit model. On educational achievement, we examine completion of primary school, grade attainment for age, and over-age for grade status. In the multivariate analysis we use reduced-form regressions to analyze the effects of gender, ethnicity, poverty, and residence, controlling for age, father's and mother's education, household size, and region of residence. We do not model school-specific variables, because school choice is endogenous. All analyses are weighted to account for sampling probabilities.

Ethnicity in the ENCOVI is determined by self-identification. Although classifying individuals by self-perception instead of language ability or observed indicators of ancestry (appearance, dress, and so on) may lead to a lower estimate of the indigenous percentage of the population (see, for example, Smith 1992), this method is currently the most accepted and widely used. The result, 42 percent, may therefore represent a lower-bound estimate of the indigenous population. The vast majority of indigenous people in Guatemala classify themselves as one of a large number of ethnicities considered Mayan. The term *Ladino* is used in Guatemala for people, mainly Mestizos, who identify themselves as having Spanish heritage. In this chapter the terms *Mayan* and *indigenous* are used interchangeably, as are *Ladino/a* and *nonindigenous*.

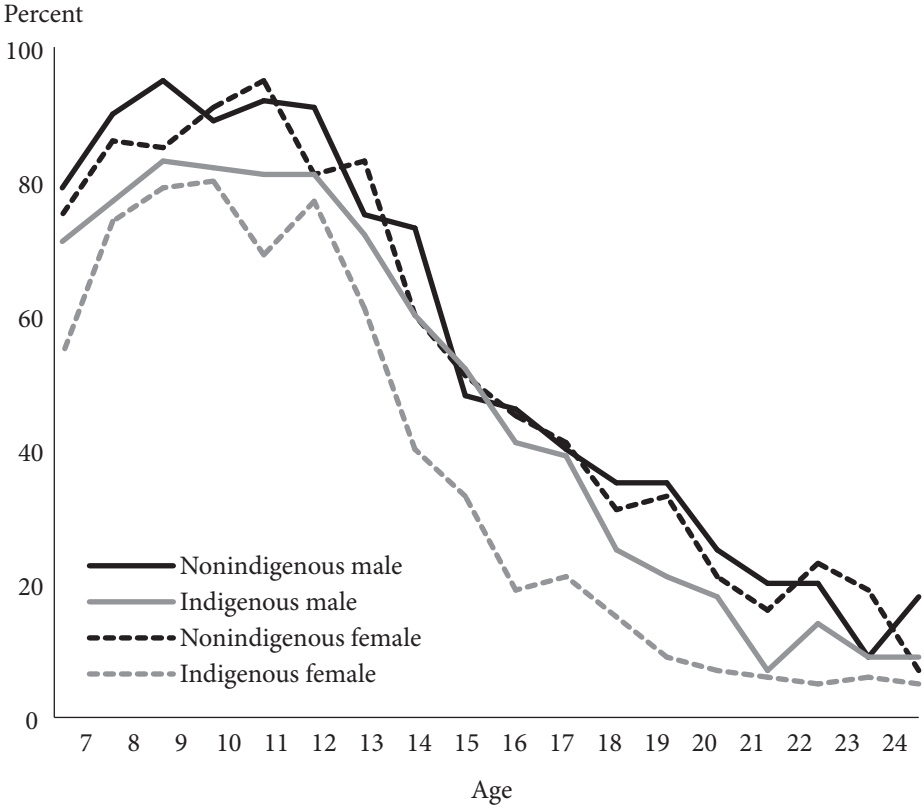
We use the Guatemalan national poverty lines of $0.67 per person per day in 2000 for extreme poverty and $1.52 per person per day in 2000 for poverty. In 2000 these levels reflected the minimum expenditure needed to purchase a nutritionally adequate basket of food items (extreme poverty) and the minimum amount needed to purchase food and other basic items (general poverty). These lines were developed jointly by the National Statistical Institute, the national planning agency (SEGEPLAN), and the Universidad Rafael Landivar, with technical assistance from the World Bank. Governmental, nongovernmental, and academic organizations have accepted these lines as the most appropriate measures of poverty in Guatemala (Shapiro 2005). Based on these measures, 43.8 percent of the population is nonpoor, 40.5 percent is medium-poor (below the poverty line but above the extreme poverty line), and 15.7 percent is extremely poor. This implies that 56.2 percent of the population lives below the official poverty line.

1 In Guatemala primary schooling is intended for children aged 7–12 years (grades 1–6) and secondary school for young people aged 13–18 years (grades 7–12).

Who goes to school? The roles of ethnicity, gender, poverty, and location

At every age indigenous girls in Guatemala are less likely to be enrolled than other demographic groups (figure 6.1). At age 7 only 54 percent of indigenous girls are in school, compared with 71 percent of indigenous boys and 75 percent of nonindigenous girls. For all four gender-ethnicity groups, enrollment peaks between 9 and 11 years of age before declining thereafter, particularly at age 12. This decline is especially large for indigenous girls: at age 16 only 25 percent of indigenous girls are enrolled, compared with about 45 percent of indigenous boys and about half of nonindigenous girls and boys. A child who entered school on time and made regular progress would complete primary school at age 12, but few nonenrolled children between 12 and 18 years have finished primary school, and their grade attainment is very low (table 6.1).

Figure 6.1. Percent currently enrolled at primary level or above by gender, ethnicity, and age



Source: ENCOVI (2000).

Table 6.1. Grade attainment and primary completion for nonenrolled children in Guatemala, 2000

	Age 12	Age 13	Age 14	Age 15	Age 16	Age 17	Age 18
Grade attained							
Indigenous female	1.0	1.3	1.8	2.0	2.3	2.2	2.3
Indigenous male	0.8	1.5	2.2	2.8	3.2	3.2	3.4
Nonindigenous female	1.9	2.5	2.4	3.4	3.9	3.7	5.1
Nonindigenous male	1.9	2.3	3.1	3.6	4.5	4.5	4.7
Completed primary school (percent)							
Indigenous female	4	4	10	12	14	16	20
Indigenous male	2	4	11	22	3	25	29
Nonindigenous female	12	22	16	34	37	36	53
Nonindigenous male	1	16	27	36	48	51	53

Source: ENCOVI (2000).

This implies that the transition from primary to secondary school is not the main reason for the dropoff in enrollment beginning at about age 12.

Who enrolls in primary school?

Indigenous enrollment among 7- to 12-year-olds is about 10 percentage points lower on average than nonindigenous enrollment, and female enrollment is about 5 percentage points lower than male enrollment (table 6.2). Enrollment levels among extremely poor children are almost 20 percentage points lower than among the nonpoor. Rural levels are 8 percentage points lower than urban levels. Extremely poor females of either ethnicity, in both rural and urban areas, are the least likely to have ever enrolled.

Primary completion rates for 13- to 24-year-olds are orders of magnitude lower than primary enrollment rates for younger children, and there are large differences across subgroups. Indigenous female completion rates are a little more than a third of Ladina rates, while indigenous male rates are about two-thirds of Ladino rates. Among indigenous people female rates are 58 percent of those of males; among Ladinas female rates are 92 percent of male rates.

Urban primary completion is more than twice that in rural areas, and the urban-rural ratio is largest for indigenous females (3 to 1, 45 percent compared with 14 percent). Urban residence appears to benefit young people in the upper two income categories more than the extremely poor. Within each ethnic group, gender differences are larger in rural than in urban areas.

Extremely poor young people are much less likely to have completed primary school than those in higher income groups: only 11 percent of extremely poor young

people, versus 33 percent of medium poor and 70 percent of nonpoor, have completed primary school. Rural indigenous girls, especially those who are poor, have the lowest primary completion rates. Conditional on entry in primary school, the poor, the indigenous, girls, and rural residents are by far the least likely to complete this level. Interactions among these four factors appear to reduce completion levels even more.

Secondary enrollment patterns are even more skewed. Extremely poor young people are the least likely to have ever enrolled at this level (3 percent). Indigenous girls have the lowest rate of the four gender-ethnicity groups (12 percent). Rural residents have a much lower rate (14 percent) than urban residents (58 percent). Indigenous females who are rural, poor, or both are by far the most disadvantaged. Among this group the urban to rural ratio is more than 6 to 1 (33 percent compared with 5 percent); the nonpoor to extremely poor ratio is 32 to 1.

Limiting the sample to those who have completed primary school reveals that indigenous youths still have a much lower secondary enrollment rate than Ladino youths. Among indigenous youth, however, female and male levels are equal. Rural rates are about half of urban ones. Within rural areas indigenous people and girls, especially those who are extremely poor, are the most disadvantaged. Across the board, the extremely poor are the most disadvantaged.

Levels of school entry are on the rise in Guatemala, but they remain low. While it is encouraging that primary entry does not vary greatly by place of residence, indigenous girls and the extremely poor are still underrepresented. Conditional on ever being enrolled, there are large differences in primary completion by ethnicity, income, and residence. Within each of these categories indigenous girls have the lowest rate. Disparities are even larger at the secondary level, with indigenous, rural, and extremely poor people, especially indigenous girls, having the lowest rates. The role of these factors is explored in more depth in the following sections.

How do gender, ethnicity, and location affect primary enrollment and completion?

At every age indigenous females are much less likely to have ever been in the school system than other groups (figure 6.2). Indigenous female enrollment is rising, however: the gender-ethnicity gap is much smaller for children ages 12 and under than for adolescents and young adults.

If a child had been enrolled in primary school, the ENCOVI survey collected information on age of initial enrollment. If a child had never been enrolled, however, it was not clear whether he or she would enroll in the future. Using only data on children who have enrolled would lead to biased estimates of who would ever enroll. To deal with these censored values, we run Cox proportional hazard models for whether 7- to 12-year-olds have ever enrolled.

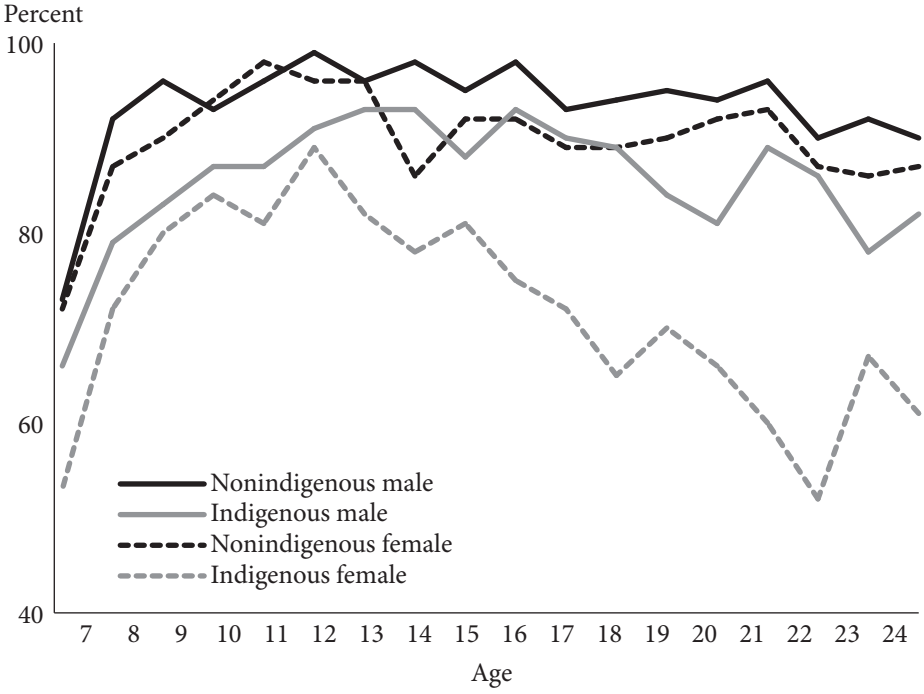
Table 6.2. Key educational indicators in Guatemala, by ethnicity, gender, poverty, and residence (percent)

	Rural					Urban
Item	Indigenous female	Indigenous male	Non-indigenous female	Non-indigenous male	Total	Indigenous female
Ever enrolled in primary school, ages 7–12						
Extremely poor	54	58	54	67	57	40
Medium poor	71	73	72	81	74	68
Nonpoor	79	80	84	81	82	87
Total	65	69	73	79	71	71
Completed primary school						
All 13- to 24-year-olds						
Extremely poor	4	12	17	15	11	13
Medium poor	13	30	25	40	27	36
Nonpoor	35	53	59	61	55	56
Total	14	30	36	44	31	45
13- to 24-year-olds who ever enrolled						
Extremely poor	8	16	24	18	16	27
Medium poor	18	33	31	44	32	47
Nonpoor	47	56	62	64	60	59
Total	21	34	42	49	38	53
Ever enrolled in secondary school						
All 13- to 24-year-olds						
Extremely poor	0	5	6	1	3	6
Medium poor	5	13	9	14	10	21
Nonpoor	16	26	38	33	31	48
Total	5	14	19	20	14	33
13- to 24-year-olds who completed primary school						
Extremely poor	8	40	35	6	26	43
Medium poor	34	45	34	36	37	58
Nonpoor	45	49	65	55	57	83
Total	36	46	52	44	46	73

Source: ENCOVI (2000).

Urban				All				
Indigenous male	Non-indigenous female	Non-indigenous male	Total	Indigenous female	Indigenous male	Non-indigenous female	Non-indigenous male	Total
61	42	60	51	52	59	53	66	57
76	73	69	72	70	73	72	78	74
89	83	86	85	83	84	83	84	84
79	80	82	79	66	71	76	80	74
25	5	24	18	5	14	16	15	11
48	57	63	52	18	33	34	45	33
70	78	83	78	46	60	73	75	70
56	74	79	70	21	36	56	61	47
31	5	25	25	9	18	23	19	16
53	63	66	58	25	37	40	49	39
72	81	84	80	54	62	76	77	73
60	78	80	74	30	40	62	64	53
8	0	15	7	1	5	6	2	3
31	38	42	34	08	17	17	21	16
57	69	72	68	32	38	60	59	54
41	63	66	58	12	20	42	42	32
32	0	64	40	14	39	35	12	28
62	64	66	63	45	49	48	46	47
80	87	84	85	68	63	82	76	77
71	84	82	81	55	55	74	67	67

Figure 6.2. Percent ever enrolled in primary school by gender, ethnicity, and age



Source: ENCOVI (2000).

The results show several significant effects (table 6.3).[2] Poor children are significantly less likely to have ever enrolled than the nonpoor. Being a poor female also greatly reduces enrollment chances. With the inclusion of interaction terms between ethnicity, gender, poverty, and residence status, being an indigenous female does not significantly reduce the chances of primary enrollment—but the combination of being female and poor (whether indigenous or not) does. Residing in a rural area is not associated with a significantly lower chance of enrolling.

Primary completion is analyzed in a multivariate framework using logistic regression.[3] Indigenous females are less than half as likely as nonindigenous males to have completed primary school (table 6.4). Young people who reside in poor households are much less likely to have finished primary than nonpoor children, and young

2 In all regressions we experimented with dividing the poverty category into extremely poor and medium poor, but for many outcomes the number of extremely poor was too small to result in stable models. We therefore present multivariate results for the binary categories of poor (extremely poor and medium poor grouped together) and nonpoor.

3 Since we do not have the age at which this level was completed, we cannot use the preferred survival model.

Table 6.3. Regression results for determinants of ever enrolled in primary school in Guatemala, 7- to 12-year-olds, 2000 (Cox proportional hazard model)

Independent variable	Hazard ratio	z-stat
Indigenous female (versus nonindigenous male)	1.18	1.92
Indigenous male (versus nonindigenous male)	1.08	0.95
Nonindigenous female (versus nonindigenous male)	1.07	1.35
Poor (versus nonpoor)	0.81	–2.65**
Indigenous female × poor	0.67	–4.16***
Indigenous male × poor	1.00	–0.04
Nonindigenous female × poor	0.84	–2.16*
Rural (versus urban)	0.91	–1.55
Indigenous female × rural	1.05	0.51
Indigenous male × rural	0.90	–1.16
Nonindigenous female × rural	1.03	0.37
Poor × rural	1.08	1.11
Age	0.99	–1.05
Father some primary	1.34	5.83***
Father completed primary	1.36	8.96***
Father primary +	1.50	7.44***
Father education missing	1.42	3.77***
Mother some primary	1.23	3.05***
Mother completed primary	1.32	9.08***
Mother primary +	1.55	7.67***
Mother education missing	1.24	1.08
Household size	0.99	–1.48
Number of observations	6,356	
Probability > χ^2	0.00	

* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: Regressions weighted for sampling probabilities. Regional dummies also included.

Source: ENCOVI (2000).

Table 6.4. Logistic regression results for determinants of who completed primary school, 13- to 24-year-olds in Guatemala, 2000

	All		Those who ever enrolled	
Independent variable	**Odds ratio**	**z-stat**	**Odds ratio**	**z-stat**
Indigenous female (versus nonindigenous male)	0.46	–3.95***	0.50	–3.31***
Indigenous male (versus nonindigenous male)	0.73	–1.45	0.72	–1.46
Nonindigenous female (versus nonindigenous male)	0.77	–1.60	0.81	–1.27
Poor (versus nonpoor)	0.58	–2.95***	0.63	–2.36*
Indigenous female × poor	0.88	–0.55	0.90	–0.44
Indigenous male × poor	0.94	–0.28	0.92	–0.39
Nonindigenous female × poor	0.84	–0.85	0.88	–0.60
Rural (versus urban)	0.63	–2.86***	0.64	–2.68**
Indigenous female × rural	0.75	–1.26	0.86	–0.61
Indigenous male × rural	1.32	1.26	1.30	1.15
Nonindigenous female × rural	0.97	–0.14	0.97	–0.15
Poor × rural	0.61	–2.85***	0.59	–2.94***
Age	1.12	10.02***	1.15	11.49***
Father some primary	1.63	4.13***	1.49	3.20***
Father completed primary	2.60	10.79***	2.26	8.84***
Father primary +	6.54	8.68***	5.86	7.83***
Father education missing	1.57	1.76	1.35	1.11
Mother some primary	1.49	2.93***	1.31	1.93*
Mother completed primary	2.72	11.16***	2.41	9.69***
Mother primary +	3.76	4.48***	3.53	4.10***
Mother education missing	0.88	–0.23	1.11	0.17
Household size	1.03	1.76	1.02	1.34
Number of observations	9,122		8,005	
Probability > χ^2	0.00		0.00	

* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: Regressions weighted for sampling probabilities. Regional dummies also included.

Source: ENCOVI (2000).

people in rural areas are much less likely than urban children to have done so. Restricting the sample to those who ever enrolled in primary does not change the results in any meaningful way.[4]

Our multivariate results yield a number of new and important findings (see table 6.16). Controlling for various individual and household characteristics, being indigenous and female does not itself reduce primary enrollment, but the combination of being indigenous, female, and poor does. Conditional on primary enrollment, being indigenous and female lowers the chances of completing primary school. Indigenous females and those who reside in rural areas are less likely to enroll in secondary school, but these effects are not significant for primary completers. Among enrolled students, being indigenous and female does not significantly lower grade for age (encompassing starting late, repeating grades, and dropout followed by reenrollment), but being indigenous, female, and rural does. Controlling for other factors, indigenous males appear disadvantaged in secondary enrollment relative to nonindigenous males. Poor nonindigenous females have lower chances of entering primary school than nonindigenous males and low grade for age when enrolled.

Poverty is the most consistent indicator of educational disadvantage, reducing chances of entering the school system and advancing within it. Rural residence does not inhibit primary enrollment (consistent with reports of increased access to primary education in rural Guatemala in the late 1990s), but it reduces the likelihood of both primary completion and secondary enrollment. For children still enrolled, living in a rural area does not significantly affect grade for age. The combination of being poor and residing in a rural area, however, is linked to lower chances of primary completion and secondary enrollment, as well as lower grade for age.

Why don't girls complete primary school?

School attendance is compulsory in Guatemala for children starting at age 7, but not all children enroll at this age (table 6.5). Parents' decision about when (and whether) to enroll their child in school has important implications for the child's future educational progress and achievement. The figures in table 6.5 are censored because not every person who will ever enroll has already done so. It is nevertheless useful to compare age at entry across gender, ethnicity, and age groups. For 7- to 24-year-olds who have ever enrolled, indigenous children start school about half a year later than nonindigenous children. (Note that cohort age trends cannot be discerned from table 6.5 because the outcome is censored.) For indigenous girls differences in starting age by poverty status are wide: girls from extremely poor households who enrolled did so 0.7 years later than girls from medium-poor households and 1.2 years later than

4 We do not attempt to correct for the selectivity of who entered primary school since we do not have instrumental variables that would influence school entry but not retention. Moreover, even if relevant data such as school quality were available, it would be inappropriate to include them in our reduced form models, because school quality is determined by school choice, which is endogenous.

Table 6.5. Age of entry into primary school in Guatemala among those ever enrolled

	All young people				Indigenous females		
Age	Indigenous female	Indigenous male	Nonindigenous female	Nonindigenous male	Extremely poor	Medium poor	Nonpoor
7–9	7.1	6.9	6.8	6.8	7.4	7.0	6.6
10–12	7.5	7.5	7.1	7.2	8.0	7.5	6.7
13–15	8.0	7.7	7.2	7.1	9.0	7.8	7.2
16–8	7.8	7.9	7.1	7.2	8.9	7.6	7.4
19–21	7.8	8.0	7.2	7.3	8.8	7.9	7.4
22–24	7.8	8.0	7.2	7.2	8.8	8.0	7.1
Total	7.6	7.6	7.1	7.1	8.3	7.6	7.1

Source: ENCOVI (2000).

Table 6.6. Percentage of students ever enrolled that entered primary school late in Guatemala

	All young people				Indigenous females		
Age	Indigenous female	Indigenous male	Nonindigenous female	Nonindigenous male	Extremely poor	Medium poor	Nonpoor
8–9	26	16	8	10	38	25	11
10–12	38	36	17	20	53	37	12
13–15	43	41	19	19	65	40	20
16–18	40	44	16	20	65	36	30
19–21	46	46	21	20	68	49	33
22–24	45	47	20	21	91	46	25
Total	38	36	17	18	56	37	22

Source: ENCOVI (2000).

nonpoor girls. Primary entry age for nonpoor indigenous girls is about equal to that of nonindigenous children.

A little more than a third of indigenous children (compared with a fifth of Ladino children) entered school later than the compulsory legal age (table 6.6). We restrict this outcome to young people 8 and older, because there may be some 7-year-olds in the survey who had not yet enrolled. As with age at primary entry, it would be misleading to interpret cohort changes from these data since they are censored. Among indigenous girls, those who are poor are much less likely to begin school on

time. More than half of extremely poor indigenous girls, a third of medium poor indigenous girls, and a fifth of nonpoor indigenous girls start school late. The proportion of nonpoor indigenous girls starting late is roughly equal to the average for nonindigenous children.

Along with the occurrence and timing of initial enrollment, continuation in school (retention), and grade repetition are the basic factors determining educational attainment. A child's rate progressing through school is important not only for grade attainment but also for determining the child's chances of advancing to the next level in the schooling cycle. Repetition also has implications for individual children and families in higher opportunity costs (lost wages and household labor) for each grade attained. It also reduces the efficiency of the schooling system by reducing classroom space available to new entrants and by increasing age heterogeneity within grades, making teaching more difficult (Patrinos and Psacharopoulos 1995).

The survey data do not provide detailed information on grade repetition and dropout followed by reentry. The only repetition data available are for currently enrolled students who were asked whether they were repeating their current grade. Analysis of these data by Edwards (2002) shows that the overall repetition rate is 21.9 percent for first grade, 14.2 percent for second grade, and an average of 12.8 percent across all six grades of primary school. Edwards does not find large ethnic or gender differences (though his analysis is not disaggregated by gender, ethnicity, poverty, and rural location), but he does find that nonpoor children have much lower repetition rates. Many researchers view such high repetition levels as a clear sign of serious deficiencies in the Guatemalan educational system.

Further insight into the degree of over-age students is gained by examining grade for age. Here we construct the grade-for-age index used by Psacharopoulos and Yang (1991). The progress of a young person in the school system is assessed using the formula:

$$\text{grade for age} = (G/A - E) \times 100,$$

where G is grade attained (grade completed, not years in school), A is age, and E is the compulsory school entry age of 7 years. Young people with a score less than 100 are making inadequate progress due to late entry, repetition, or dropout and re-entry. We limit this outcome to children 8 and older, because the value is undefined for 7-year-olds.

Table 6.7 presents the values of this index for young people currently enrolled in school. Indigenous children have much lower grade-for-age indices than nonindigenous children. Among indigenous people, girls' grade-for-age levels are worse than boys' through age 15. Starting at age 16, however, Mayan girls' grade-for-age index is higher than Mayan boys'—possibly because only the most academically qualified indigenous girls remain in school past age 15.

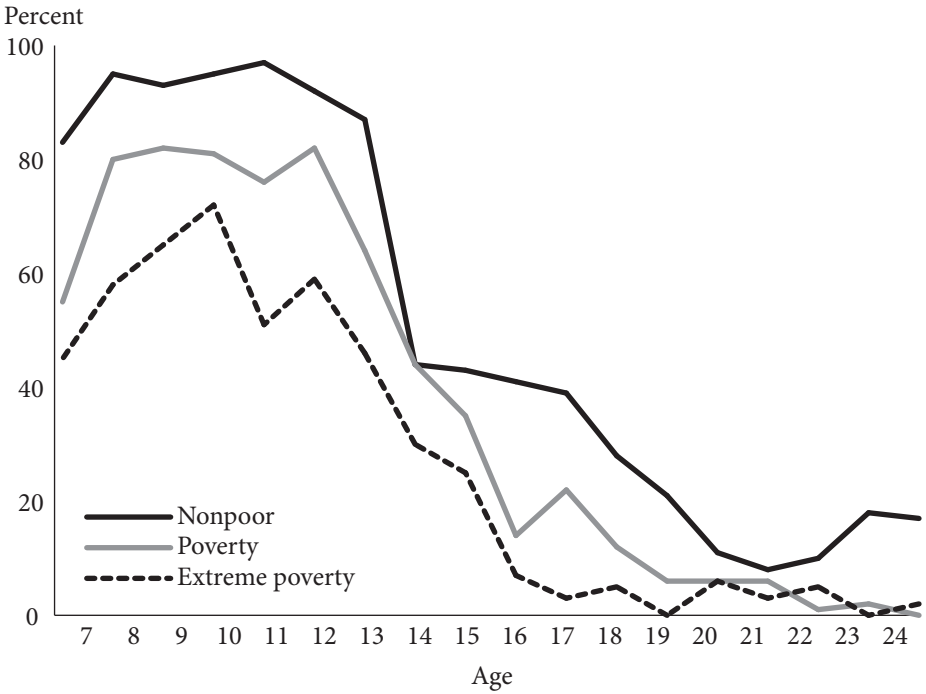
Table 6.7. Grade-for-age index among currently enrolled students in Guatemala

	All young people				Indigenous females		
Age	Indigenous female	Indigenous male	Non-indigenous female	Non-indigenous male	Extremely poor	Medium poor	Nonpoor
8–9	53.0	67.4	88.1	79.0	34.1	54.8	73.3
10–12	53.1	55.5	77.8	77.0	34.3	53.9	80.1
13–15	56.6	63.0	79.6	82.1	35.6	57.9	78.2
16–18	73.9	65.7	85.0	83.9	—[a]	66.8	84.7
19–21	73.9	68.1	87.3	81.6	—[a]	—[a]	—[a]
22–24	—[a]	62.0	75.9	72.6	—[a]	—[a]	—[a]
Total	56.0	61.7	81.9	79.6	34.3	55.9	78.6

a. Cell size < 30.

Source: ENCOVI (2000).

Figure 6.3. Percent of indigenous girls currently enrolled by poverty status



Source: ENCOVI (2000).

Table 6.8. Percent over-age for grade among students currently enrolled in Guatemala

	All young people				Indigenous females		
Age	Indigenous female	Indigenous male	Nonindigenous female	Nonindigenous male	Extremely poor	Medium poor	Nonpoor
8–9	66	53	38	41	79	63	53
10–12	81	82	56	59	94	82	57
13–15	88	86	63	61	98	91	68
16–18	77	92	61	69	—[a]	94	60
19–21	75	92	55	70	—[a]	—[a]	—[a]
22–24	—[a]	97	64	87	—[a]	—[a]	—[a]
Total	77	78	54	58	90	79	60

a. Cell size < 30.

Source: ENCOVI (2000).

Consistent with our findings for primary enrollment and entry age, Mayan girls who are nonpoor have grade-for-age levels nearly equal to those of nonindigenous students. Among Mayan girls ages 14 to 20 still enrolled, a large proportion are nonpoor (figure 6.3).

A binary indicator was created for being over-age for grade (table 6.8). Students with grade-for-age index values of less than 100 are defined as over-age. Among enrolled children, more than half of Ladinos and three-fourths of Mayans are older than they would have been had they entered school on time and not repeated grades. Over-age-for-grade status varies widely by poverty status, with 90 percent of extremely poor, 80 percent of medium-poor, and 60 percent of nonpoor Mayan girls over-age. The proportion of over-age nonpoor Mayan girls is about the same as that of nonindigenous boys. Tobit estimates of the grade-for-age index for current students show that poor students have significantly lower grade-for-age levels than nonpoor students (table 6.9).[5] There are also significant interaction effects of being nonindigenous, female, and poor, of being indigenous, female, and rural, and of being poor and rural. Being indigenous and female has a negative but nonsignificant effect on grade for age.

Who enrolls in secondary school?

Enrollment in secondary school is very low, with no group exceeding 60 percent (figure 6.4). Both indigenous females and males fall well below nonindigenous levels. Among

5 We also experimented with a logistic estimator for the over-age outcome, but the preponderance of over-age children resulted in an unstable model due to a large number of observations dropping from the regression.

Table 6.9. Grade-for-age index among currently enrolled 7- to 24 year-olds in Guatemala (tobit, lower and upper limit), 2000

Independent variable	Coefficient	t-stat
Indigenous female (versus nonindigenous male)	–4.01	–1.25
Indigenous male (versus nonindigenous male)	–0.76	–0.26
Nonindigenous female (versus nonindigenous male)	2.91	1.70
Poor (versus nonpoor)	–11.86	–4.57***
Indigenous female × poor	–2.57	–0.69
Indigenous male × poor	–1.25	–0.38
Nonindigenous female × poor	–5.72	–2.02*
Rural (versus urban)	–3.39	–1.50
Indigenous female × rural	–9.39	–2.55***
Indigenous male × rural	–4.87	–1.43
Nonindigenous female × rural	1.04	0.38
Poor × rural	–5.15	–2.15*
Age	–0.27	–1.95*
Father some primary	4.72	2.54**
Father completed primary	11.87	9.03***
Father primary +	22.84	11.90***
Father education missing	7.66	1.60
Mother some primary	4.56	1.62
Mother completed primary	12.85	10.44***
Mother primary +	15.77	8.18***
Mother education missing	27.78	2.70**
Household size	–0.39	–1.69
Number of observations	7,726	
Probability > χ^2	0.00	

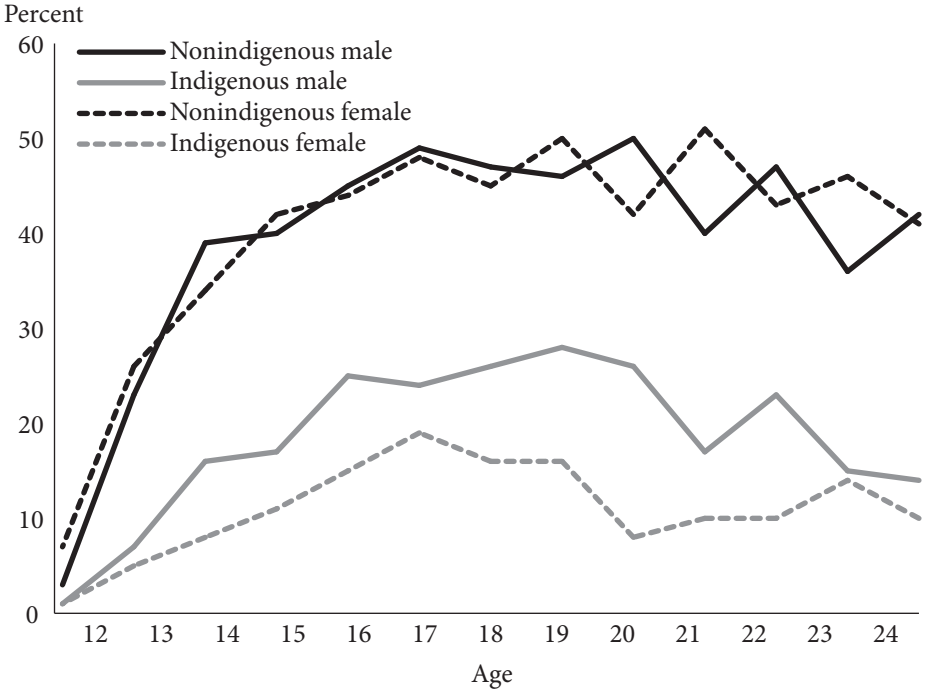
* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: Regressions weighted for sampling probabilities. Regional dummies also included.

Source: ENCOVI (2000).

18-year-olds, indigenous youths are about half as likely to have attended secondary school as nonindigenous youths. Mayan secondary enrollment occurs at later ages

Figure 6.4. Percent of children ever enrolled in secondary school by gender, ethnicity, and age



Source: ENCOVI (2000).

and with less uniformity in the transition age between the primary and secondary cycles than does nonindigenous secondary enrollment.

Since this outcome is censored and age at secondary enrollment is available in the survey, survival estimates are used for the multivariate analysis. For all 13- to 24-year-olds, indigenous young people are about 20 percent less likely than Ladinos to have ever enrolled in secondary school (table 6.10). Youths who reside in poor households or rural areas have much lower chances of ever enrolling at this level. We also find significant negative interaction effects between being indigenous, female, and rural and between being poor and rural. Limiting the sample to young people who completed primary school,[6] we find that indigenous males, the poor, and rural dwellers are much less likely to advance from primary to secondary school. In the conditional sample, neither the indigenous female effect nor the interactions between being indigenous, female, and rural or being poor and rural remain statistically significant.

6 We do not attempt to correct for selectivity in who completed primary school, since we do not have instrumental variables that would influence primary completion but not secondary enrollment.

Table 6.10. Guatemalan 13- to 24 year-olds ever enrolled in secondary school, 2000 (Cox proportional hazard model)

	All		Primary school completers	
Independent variable	**Hazard ratio**	**z-stat**	**Hazard ratio**	**z-stat**
Indigenous female (versus nonindigenous male)	0.77	–2.38*	0.92	–0.83
Indigenous male (versus nonindigenous male)	0.78	–2.28*	0.82	–2.07*
Nonindigenous female (versus nonindigenous male)	0.96	–0.59	1.04	0.62
Poor (versus nonpoor)	0.60	–3.91***	0.65	–2.95***
Indigenous female × poor	0.74	–1.54	0.92	–0.42
Indigenous male × poor	1.21	1.16	1.34	1.75
Nonindigenous female × poor	0.83	–1.12	0.87	–0.78
Rural (versus urban)	0.50	–7.52***	0.53	–6.80***
Indigenous female × rural	0.68	–2.01	0.94	–0.30
Indigenous male × rural	1.31	1.81	1.21	1.29
Nonindigenous female × rural	1.07	0.55	1.13	0.95
Poor × rural	0.55	–4.69***	0.85	–1.30
Age	0.99	–0.90	0.96	–5.52***
Father some primary	1.60	4.44***	1.22	2.06*
Father completed primary	2.11	9.39***	1.31	3.86***
Father primary +	3.38	12.52***	1.90	7.42***
Father education missing	1.60	2.13*	1.12	0.50
Mother some primary	1.40	3.11***	1.15	1.41
Mother completed primary	2.20	11.25***	1.52	6.66***
Mother primary +	2.86	11.46***	2.02	8.62***
Mother education missing	1.64	1.48	1.36	0.71
Household size	1.01	0.82	1.00	–0.02
Number of observations	9,119		4,410	
Probability > χ^2	0.00		0.00	

* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: Regressions weighted for sampling probabilities. Regional dummies also included.

Source: ENCOVI (2000).

Why don't girls go to school?

For primary school-age children (7 to 12 years), lack of access (including distance to school, lack of a local school, and lack of an appropriate grade at a local school) was not the most frequently cited reason for not attending school, even among rural children (table 6.11). While girls were more likely to cite distance and transport as obstacles, the prevalence is still low, at about 6 percent for all girls. Lack of money was the single most important factor identified, and its prevalence did not vary by gender or ethnicity. Lack of interest in school was the second most frequently named reason, followed by age—presumably being over-age for grade. After these reasons, females, especially indigenous ones, mentioned household duties as the main cause, while boys cited work. Among indigenous girls, age was more frequently cited by the extremely poor.

Among 13- to 24-year-olds, household duties were most often cited by females, and work was most often cited by males. Nonindigenous females were more likely than indigenous females to cite market work (as opposed to household chores). Lack of money was the second most common issue, with few differences by ethnicity. Lack of interest was the third reason, with the level highest among indigenous females. As with 7- to 12-year-olds, access factors were infrequently stated as the main cause for nonenrollment, even among rural dwellers. Among nonenrolled indigenous females, causes varied by poverty level. The poor were much more likely to cite lack of money and housework, while the nonpoor more often cited market work and lack of interest as the main reasons.

Household labor demands and poverty

The possibility of child labor constraining enrollment is relevant in a country as poor as Guatemala. The reasons stated by Guatemalan children for nonenrollment indicate that poverty and opportunity costs are fundamental deterrents to schooling. Moreover, our multivariate results show that poverty and rural residence are key barriers to schooling, especially for females—and more for indigenous females.

To investigate the work-schooling question in more depth, we construct a variable reflecting activity status the week before the survey. The outcomes consist of four mutually exclusive categories: enrolled in school and not working, combining school with work (not household chores), not enrolled in school but working, and neither enrolled in school nor working for pay. The last category may include young mothers, "hidden" child workers, or children (mainly girls) who spend substantial time on household chores (Mealli, Pudney, and Rosati 2004).

Among 7- to 12-year-olds, indigenous children are much less likely to be attending school exclusively—only 60 percent compared with 80 percent of Ladino children (table 6.12). Mayan children are about twice as likely as Ladino children to combine school and work. Within each ethnic group, the proportion of boys combining school and work is about twice that of girls. Working without being enrolled is the least likely

Table 6.11. Main reason cited for not currently being enrolled in school in Guatemala (percent)

	All children						Indigenous females		
Age/reason	Indigenous females	Indigenous male	Non-indigenous females	Non-indigenous male	Urban	Rural	Extremely poor	Medium poor	Non-poor[a]
7–12									
Sick/ incapacitated	0.8	5.1	4.2	4.9	4.4	3.2	1.3	0.0	3.8
Unable to pay monthly fee	0.3	0.5	1.0	2.9	0.7	1.1	0.0	0.8	0.0
Housework	10.6	2.1	7.1	1.0	2.1	6.7	11.0	11.0	0.0
Work	1.5	6.3	1.3	4.8	3.3	3.3	1.0	1.7	6.7
Lack of money	39.3	38.3	35.5	38.3	38.1	37.9	38.1	39.6	51.1
Finished studies	0.3	0.4	0.1	0.0	0.0	0.3	0.0	0.7	0.0
Not interested	12.1	16.6	18.3	16.7	20.5	14.3	9.4	16.4	0.0
Require special school	0	0.1	0.1	1.2	1.1	0.1	0	0	0.0
Have to repeat (grade)	0.2	0.4	1.4	2.2	0.5	1.0	0.4	0	0.0
Temporary migration	3.0	0	0.5	0	4.2	0.3	0.5	6.2	0.0
Distance/ transport	4.5	1.7	8.5	1.9	4.7	4.0	5.9	1.7	17.0
There is no school	1.8	1.2	0.2	0.1	0.1	1.2	1.6	2.3	0.0
School does not offer that grade	1.0	0	0.3	0.3	0	0.5	0	2.1	0.0
Age	13.3	18.4	15.6	16.1	11.7	16.7	17.0	9.1	12.0
Other reason	11.3	8.9	6.0	9.8	8.7	9.4	13.9	8.5	9.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of observations	371	297	258	226	269	883	205	151	15

category. A quarter of Mayan girls are neither working nor in school. By poverty status, the disparities in activity status for Mayan girls are very large: 83 percent of the nonpoor are exclusively in school compared with only 47 percent of the extremely poor. Of every five extremely poor Mayan girls, two are neither in the labor force nor enrolled in school. The percentage of nonpoor Mayan girls studying exclusively is about the same as that of nonindigenous girls.

	All children						Indigenous females		
Age/reason	Indigenous females	Indigenous male	Non-indigenous females	Non-indigenous male	Urban	Rural	Extremely poor	Medium poor	Non-poor[a]
13–24									
Sick/ incapacitated	1.5	1.3	1.5	1.1	1.5	1.3	1.2	1.8	1.4
Unable to pay monthly fee	0.2	0.4	0.6	0.9	0.9	0.4	0.2	0.1	0.7
Housework	35.4	0.7	33.0	0.2	12.7	21.6	39.2	36.3	28.5
Work	9.8	50.2	18.0	55.6	34.1	31.2	8.1	8.8	14.3
Lack of money	22.0	24.4	21.7	21.7	24.4	21.3	22.1	23.7	17.9
Finished studies	1.1	1.1	0.6	1.2	1.0	1.0	1.9	1.1	0.3
Not interested	20.4	15.0	12.7	12.8	15.5	14.8	15.9	20.0	26.9
Pregnant	0.7	0.0	1.8	0.0	1.5	0.4	0.6	0.6	0.9
Require special school	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.1
Have to repeat (grade)	0.6	0.3	0.3	0.3	0.2	0.5	0.6	0.6	0.6
Temporary migration	0.2	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.4
Distance/ transport	1.0	0.5	0.9	0.6	0.2	1.0	1.5	0.5	1.5
There is no school	2.1	1.7	0.5	0.8	0.8	1.3	1.0	2.3	2.9
School does not offer that grade	0.1	0.5	0.3	0.1	0.2	0.2	0.3	0.0	0.0
Age	2.1	1.3	0.9	0.9	0.5	1.6	2.6	2.4	0.9
Other reason	2.9	2.5	7.0	3.7	6.5	3.3	5.0	1.9	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of observations	1,405	1,099	1,730	1,550	1,959	3,825	385	704	316

a. Number of observations is less than 30.

Source: ENCOVI (2000).

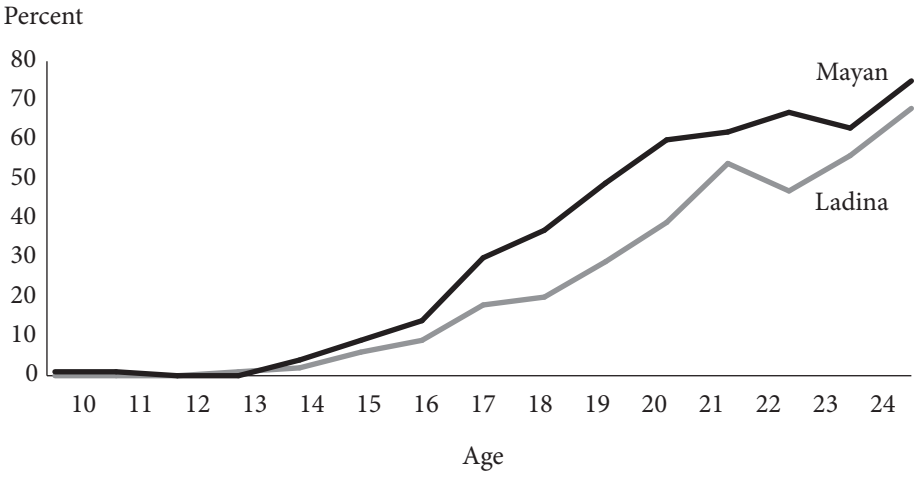
For 13- to 24-year-olds, the divergence in activity status by gender and ethnicity is even greater. Ladino adolescents are about twice as likely as Mayan adolescents to be studying exclusively. Males, especially Mayans, are more likely than females to combine school and work or to work without attending school. Females in each ethnic group are at least five times more likely than males to be neither studying nor in the labor force. Among Mayan females, the extremely poor are half as likely to be

Table 6.12. Work/school activity status among 7- to 24-year-olds in Guatemala (percent)

	All				Indigenous females		
Age	Indigenous female	Indigenous male	Non-indigenous female	Non-indigenous male	Extremely poor	Medium poor	Non-poor
7–12							
School only	62.0	57.1	79.7	77.8	47.3	65.3	83.1
School and work	9.9	21.0	5.7	10.5	6.3	12.3	9.5
Work, no school	3.2	6.6	1.4	2.6	5.7	1.9	2.0
Neither work nor school	25.0	15.3	13.3	9.2	40.7	20.5	5.5
13–24							
School only	14.7	14.5	29.1	26.5	10.0	13.9	20.9
School and work	8.0	21.2	10.4	16.9	4.4	7.6	12.3
Work, no school	33.2	58.9	21.7	49.6	29.1	33.4	36.6
Neither work nor school	44.1	5.4	38.8	6.9	56.4	45.2	30.2

Source: ENCOVI (2000).

Figure 6.5. Percent of married indigenous and nonindigenous females, by age



Source: ENCOVI (2000).

studying exclusively and nearly twice as likely as their nonpoor counterparts to be neither working nor in school.

Marrying young and dropping out of school

In developing countries, marriage before age 18 is generally associated with lower rates of school enrollment and education attainment for females (Mensch 2005). Despite the early age of leaving school in Guatemala, females do not begin to marry or bear children until well after the age when school enrollment begins to decline. (Virtually all fertility among this population occurs within marriage, so we examine only marriage as a possible deterrent to schooling.) Age at marriage in Guatemala is younger for Mayan than for Ladina women, and ethnic disparities begin to appear around age 15 (figure 6.5). By age 18 almost 40 percent of Mayan females are married—nearly twice the percentage of Ladina females the same age.

The survey did not include questions on age of school leaving or age at marriage, so it is not possible to construct a variable reflecting the relationship between the timing of these two events. By marital status, however, there are large differences in female enrollment for both ethnic groups: only 3 percent of married 15- to 19-year-old females are enrolled compared with more than 40 percent of the unmarried (table 6.13).

Table 6.13. School enrollment in Guatemala by marital status (percent)

	Unmarried			Married		
Age	Indigenous female	Nonindigenous female	Total	Indigenous female	Nonindigenous female	Total
15–19	30 (623)	52 (1,036)	44 (1,659)	2 (227)	4 (230)	3 (457)
20–24	17 (213)	30 (483)	26 (696)	1 (394)	6 (567)	4 (961)
Total	27 (836)	45 (1,519)	39 (2,355)	1 (621)	5 (797)	4 (1,418)

Note: Number of observations is shown in parentheses.

Source: ENCOVI (2000).

Table 6.14. Marital status by school enrollment (percent)

	Not enrolled			Enrolled		
Age	Indigenous female	Nonindigenous female	Total	Indigenous female	Nonindigenous female	Total
15–19	34 (658)	31 (714)	32 (1372)	3 (192)	2 (552)	2 (744)
20–24	76 (566)	61 (873)	64 (1,439)	10 (41)	19 (177)	17 (218)
Total	50 (1,224)	48 (1,587)	49 (2,811)	4 (233)	6 (729)	5 (962)

Note: Number of observations is shown in parentheses.

Source: ENCOVI (2000).

Table 6.15. Bivariate probit regressions for determinants of continued enrollment and marriage, 15- to 24-year-old females in Guatemala, 2000

	Enrolled		Married	
Independent variable	**Coefficient**	**z-stat**	**Coefficient**	**z-stat**
Indigenous	–0.11	–0.82	–0.09	–0.67
Poor	–0.26	–1.20	0.17	1.23
Indigenous × poor	–0.06	–0.32	0.04	0.25
Rural	–0.60	–5.50***	0.32	2.64**
Indigenous × rural	–0.01	–0.04	0.08	0.56
Poor × rural	0.02	0.09	–0.23	–1.59
Age	–0.17	–11.02***	0.23	19.60***
Father some primary	0.28	2.11	0.17	1.95*
Father completed primary	0.41	4.34***	–0.49	–5.70***
Father primary +	0.95	7.05***	–0.52	–3.38***
Father education missing	0.29	1.25	–0.66	–2.00*
Mother some primary	–0.22	–1.49	0.71	6.02***
Mother completed primary	0.39	3.78***	–0.70	–7.05***
Mother primary +	0.88	5.55***	–0.57	–3.47***
Mother education missing	0.26	0.63	–0.08	–0.19
Household size	0.01	0.89	–0.06	–4.18***
Constant	2.14	0.00***	–4.38	0.00***
Covariance	–0.67	0.00		
Wald test of $\rho = 0$	102.306			
Number of observations	3,773			
Wald $\chi^2(42)$	1,152.61			
Probability > χ^2	0.00			

* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: Regressions weighted for sampling probabilities. Regional dummies also included.

Source: ENCOVI (2000).

However, only 32 percent of nonenrolled 15- to 19-year-old indigenous females are married (24 percent have a child) (table 6.14). These results indicate that early marriage and motherhood are unlikely to inhibit female enrollment directly. Bivariate probit estimates modeling the relationship between current enrollment and marital

status for 15- to 24-year-old women reject the null hypothesis of enrollment and marital status being independent (the test statistic for the Wald test is significantly different from zero) (table 6.15).[7, 8] This implies that the outcomes are negatively related with statistical significance. The results also show that neither being indigenous nor being poor is significantly related to either enrollment or marital status. Residing in a rural area has significant effects for both outcomes in expected directions. None of the interaction terms is statistically significant.

Even if the timing of school leaving and marriage do not directly coincide, it is likely that parental expectations of daughters' future life paths may influence investment in education. Our qualitative research in these communities (Colom and others 2004) reveals that, while parents initially report having the same education aspirations for their sons and daughters, on further probing some state they are reluctant to invest in daughters' education beyond the age of puberty because of high direct and opportunity costs, fear of possible interaction with boys, and a perceived risk of early pregnancy—and because most expected their daughters' future livelihood activities to consist mainly of acting as wives and mothers, roles for which advanced education is not necessarily viewed as beneficial.

Lack of access

Access issues were low among the reasons cited for nonenrollment for all ages. It is possible, however, that a lack of school facilities in rural areas—particularly at the secondary level (Andersen 2001)—may result in other causes for nonenrollment being cited by young respondents. Hall and Patrinos (2005) and Clemens (2004) emphasize that greater access to secondary schooling increases the chances of primary completion. The cost of schooling is also believed to be an important deterrent for secondary enrollment in Guatemala, since fees increase dramatically at this level (Edwards 2002).

Indigenous girls' schooling experiences

Our analysis indicates that indigenous females—particularly those who are poor or live in rural areas—are the most disadvantaged group educationally. They are less likely to ever enroll in school, and, when they do, they start later and drop out earlier. Conditional on enrollment, indigenous girls have the lowest grade-for-age levels. Enrollment trends by age, however, show that the proportion of indigenous females participating in the education system is rising.

7 Technically, both continued enrollment and being unmarried are censored variables; we model each here as logistic outcomes, however, since we do not have timing information for either.

8 Restricting the age group in the regression to ages 15–19 yielded very similar results.

Even with increasing enrollment rates, low enrollment remains a serious problem, particularly starting at age 12. The declines at this age are especially dramatic for indigenous females. While the percentages of indigenous boys and girls enrolled are about equal at age 10 (at about 80 percent), by age 14 they diverge (60 percent of indigenous males compared with only 40 percent of indigenous females). The reasons cited by young people for nonenrollment are dominated by household economic constraints and demands for their labor.

Along with the acceleration in gender-related adult labor roles, age 12 also corresponds to the onset of puberty and parental concerns about daughters mixing with boys. In our qualitative research investigating barriers and constraints to schooling and social participation among indigenous girls and boys in four rural indigenous Guatemalan communities (Colom and others 2004), we find that parents view adolescent girls' interactions with boys as potentially damaging to their daughters' reputations and subsequent marriageability. They also fear that such interactions may put their daughters at increased risk of early, out-of-wedlock pregnancy. (Birth outside of a marriage/consensual union is uncommon and highly stigmatized in rural Mayan communities.)

In addition to using the ENCOVI data to explore whether indigenous female status is a cause of unfavorable schooling outcomes, we also investigated diversity within this group. A noteworthy set of findings is that for most outcomes, differences by poverty status for indigenous females are greater than average gender-ethnicity differences. For primary enrollment, age at school entry, and grade-for-age status, nonpoor indigenous female levels are about equal to those of nonindigenous girls. Their levels of primary completion conditional on enrollment and secondary enrollment conditional on primary completion are about 80 percent of those of nonindigenous girls. In contrast, extremely poor indigenous females have by far the lowest levels of primary entry, primary completion, and secondary enrollment.

Policy implications for getting girls into school

The main reason cited by primary-school-age children in all four gender-ethnicity groups for not being enrolled was lack of money. Among 13- to 24-year-olds, housework was the primary reason given by all females, followed by lack of money and no interest among the indigenous, and lack of money and market work among the nonindigenous. For males regardless of ethnicity, market work, lack of money, and no interest were the three leading reasons cited for not being enrolled. Table 6.16 summarizes the findings from the extensive multivariate analysis in this chapter and shows the importance of the interaction of being indigenous, female, and poor or rural.

What can policymakers do to encourage enrollment? In addition to poverty reduction programs, mechanisms to encourage families to start their children's

Table 6.16. Significant multivariate results on gender, ethnicity, poverty, and geography regressors

	Ever primary	Complete primary		Ever secondary		Grade for age
Item	**All**	**All**	**Primary enrollees**	**All**	**Primary completers**	**Enrolled**
Indigenous female		⇓***	⇓***	⇓**		
Indigenous female × poor	⇓***					
Indigenous female × rural				⇓*		⇓**
Indigenous male				⇓*	⇓*	
Nonindigenous female × poor	⇓*					⇓*
Poor	⇓**	⇓**	⇓**	⇓***	⇓**	⇓***
Rural		⇓**	⇓**	⇓***	⇓***	
Poor × rural		⇓**	⇓**	⇓***		⇓*

* Significant at the 5 percent level.
** Significant at the 1 percent level.
*** Significant at the .1 percent level.

Note: ⇓ indicates that the factor reduces the variable in a statistically significant way. Age, education of mother and father, household size, and regional dummies are included in all regressions.

Source: Tables 6.3, 6.4, 6.9 and 6.10.

schooling at age 7 may lead to fewer competing interests in time allocation as children approach puberty and are compelled to take on more adult labor roles. Our analysis shows that the vast majority of non-enrolled 12- to 18 year-olds had not completed primary school. For girls a gap of about five years was observed between the ages when enrollment levels decline and marriage begins. Our multivariate results did, however, indicate a significant negative relationship between these two outcomes, and our qualitative research (Colom and others 2004) reveals that Mayan parents' expectations of their daughters' future livelihood activities may contribute to low investments in female post-puberty education.

These findings point to the need to better target scholarships and other educational incentive programs. While the current government approach of expanding access to primary education in rural areas is a positive one, it may not be sufficiently precise. Even though extremely poor households are disproportionately located in rural areas, a quarter of the rural households in the survey were nonpoor. Moreover, among the poor, girls are the most disadvantaged.

Expanding access to bilingual education in the early grades has been shown to reduce grade repetition and dropout among indigenous students (Morren 1988;

Patrinos and Velez 1996; Enge and Chesterfield 1996). Currently only a third of rural children have access to such programs (Shapiro 2005).

The government could experiment with innovative programs—some already operating in Latin America—that allow poor rural children to attend school in ways more compatible with their work responsibilities. Examples include video conferencing or correspondence study. Our qualitative research in rural highland Mayan communities reveals that nonenrolled indigenous girls—most engaged in domestic and childcare activities—are severely isolated socially, with church attendance the only form of interaction outside the household (Colom and others 2004). Non-traditional programs that combine instruction with social interaction in safe local community spaces may increase not only girls' educational prospects but also their access to social networks and social support. Acquiring and mobilizing the cooperation of the local community and working with known and trusted Mayan organizations is likely to improve the cultural acceptability, effectiveness, and sustainability of such programs (Stromquist, Klees, and Miske 1999).

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Part II

Less diversity and higher enrollment

7 *Rural Bangladesh: Sound policies, evolving gender norms, and family strategies*

Sidney Ruth Schuler

Bangladesh made rapid progress in increasing access to basic education, achieving gender parity in primary and secondary school enrollment, and closing the gap between urban and rural children during the 1990s. The adult literacy rate rose from 34.6 percent in 1990 to 51.2 percent in 1998 (Bangladesh Bureau of Education Information and Statistics 1992; UNICEF 1998, cited in Nath and Chowdhury 2002). Primary enrollment doubled between 1985 and 2001 (Wils, Carrol, and Barrow 2005), and the number of primary schools nearly doubled in the 1990s. By 2001 the gross primary enrollment rate was 97.5 percent, with no disparity between boys and girls (estimates of the net

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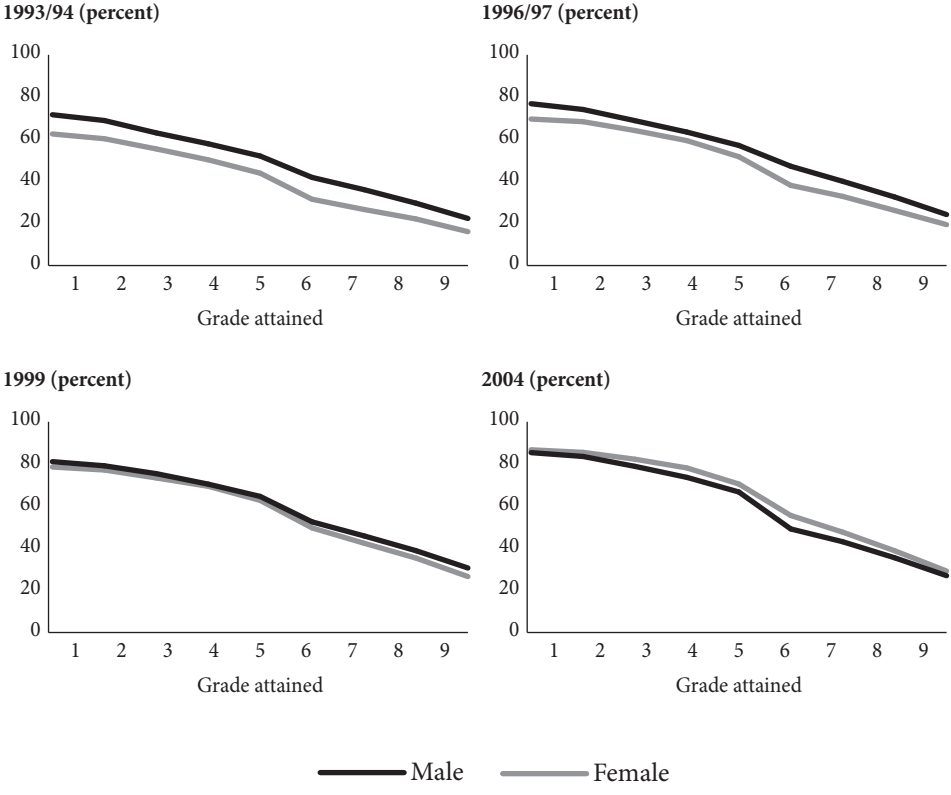
Table 7.1. Male and female enrollment in Bangladesh, 2004 (percent of relevant age group)

	Male		Female		
Age	Urban	Rural	Urban	Rural	Total
6–10	81.1	83.0	83.2	86.9	84.4
11–15	63.0	66.9	65.9	71.3	68.2
6–15	72.6	75.5	74.0	79.4	76.6
16–20	33.3	29.2	32.2	22.0	27.0
21–24	26.2	14.5	11.3	5.1	11.1

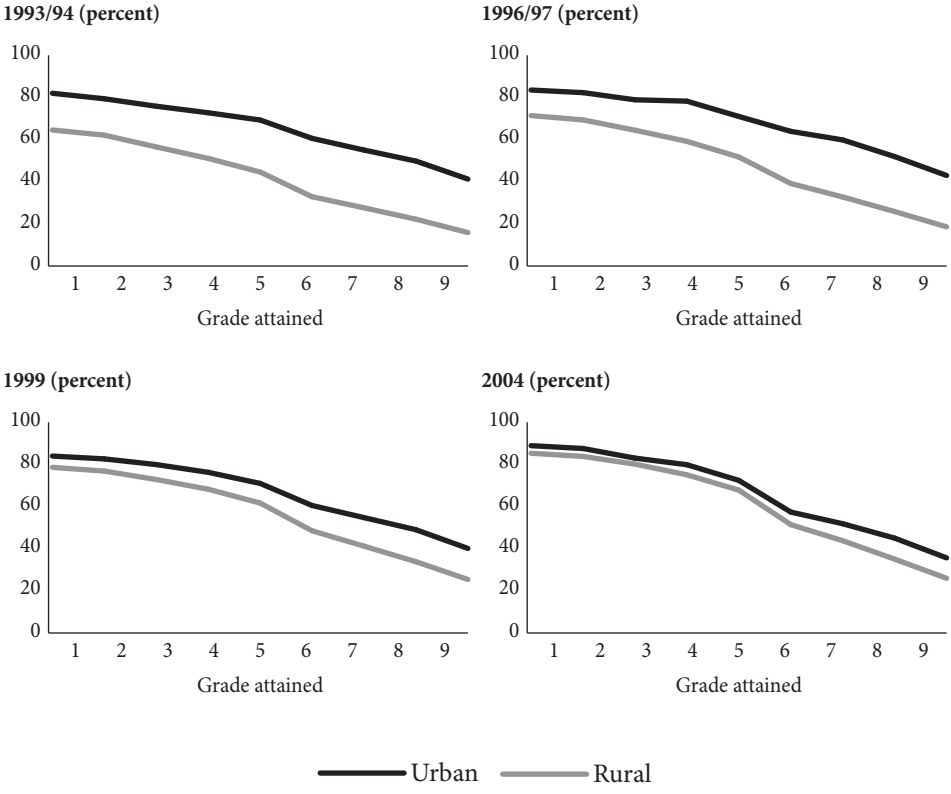
Source: Bangladesh Demographic and Health Survey 2004, cited in NIPORT, Mitra and Associates, and ORC Macro 2005.

Figure 7.1. Grade attainment by 15- to 19-year-olds in Bangladesh, by gender



Source: Academy for Educational Development analyses of Bangladesh Demographic and Health Survey data.

Figure 7.2. Grade attainment by 15- to 19-year-olds in Bangladesh, by urban/rural location



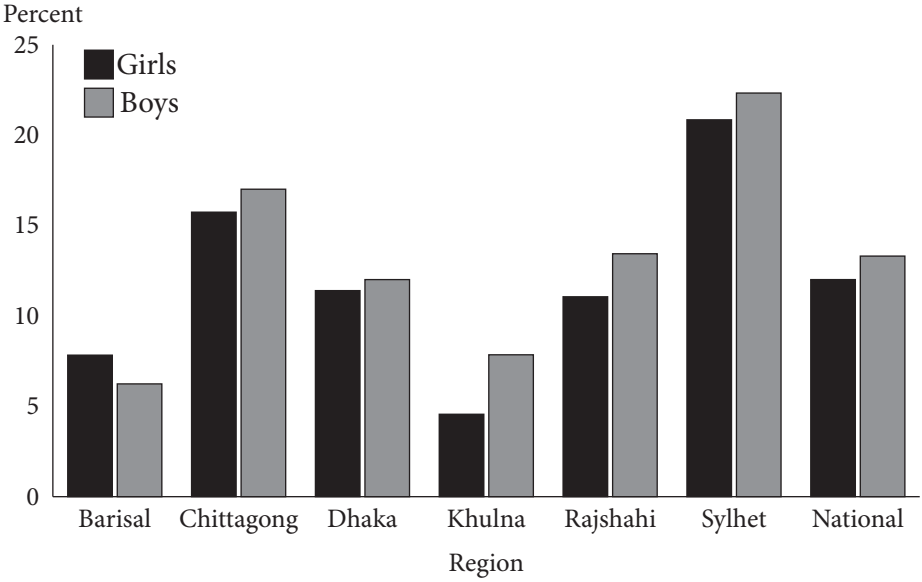
Source: Academy for Educational Development analyses of Bangladesh Demographic and Health Survey data.

enrollment rate range from 75 percent to 87 percent) (World Bank 2003a). Data from the 2004 Bangladesh Demographic and Health Survey (NIPORT, Mitra and Associates, and ORC Macro 2005) show an advantage for girls and rural children through age 15 (table 7.1).

Whereas near parity in enrollment had been achieved between primary school-age girls and boys as early as 1993/94 (NIPORT and others 1994) and among children through age 15 by 1996/97 (NIPORT 1997), girls' educational attainment caught up with boys' relatively recently. In 1993 the percentage of girls completing each grade level was less than the percentage of boys, but by 2004 girls were ahead at every grade level through the end of secondary school (figure 7.1).

Similar progress took place in reducing rural/urban disparities. Although attainment levels of rural children were still slightly lower than those of urban children

Figure 7.3. Percent of 15- to 19-year-old males and females in Bangladesh with no education, by region



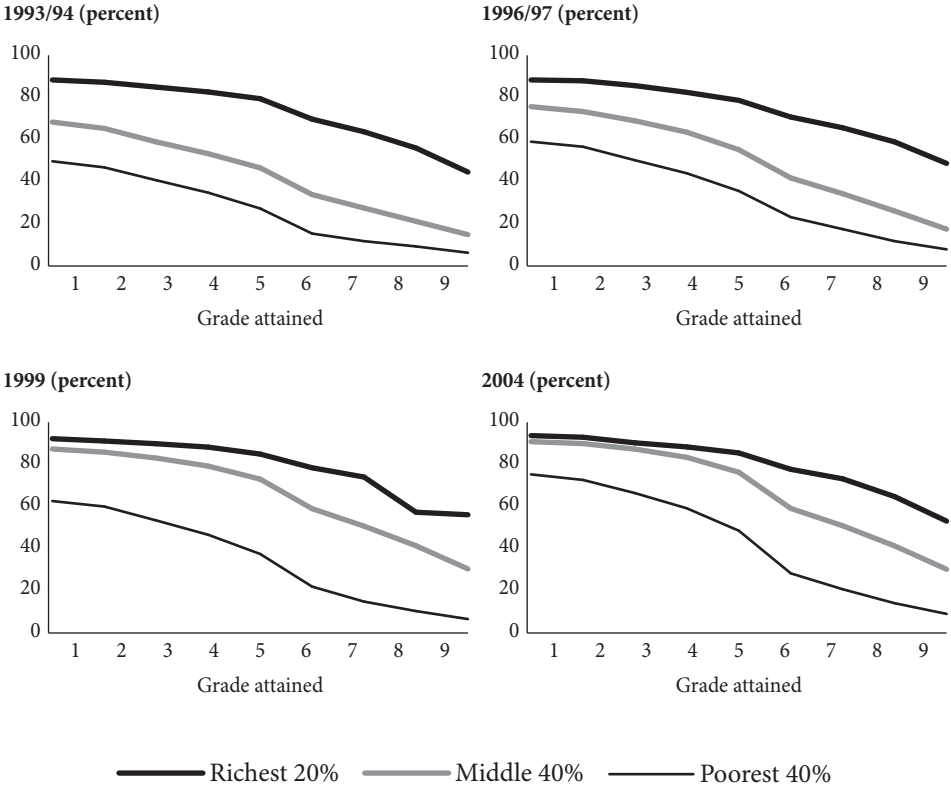
Source: Academy for Educational Development analyses of Bangladesh Demographic and Health Survey data.

in 2004 (figure 7.2), children in rural areas surpassed urban children in primary and secondary enrollment (see table 7.1).

Despite these achievements, economic and regional disparities in basic education remain. Bangladesh has a relatively small proportion of ethnic minorities and geographically isolated villages, where access to education is far below the national average: a survey by Education Watch identified villages in remote areas with net primary enrollment rates as low as 20 percent (Ahmed and Nath 2005). Studies have found similar disparities in dropout, repetition, completion, and attendance rates—but, notably, not gender-based disparities (World Bank 2003a). Results from the Bangladesh Demographic and Health Survey also show marked differences across geographic regions in access to education (figure 7.3). Consistent with World Bank findings, however, the percentage of 15- to 19-year-old girls with no education is slightly less than the percentage of boys with no education in all but one region.

The results of the 2004 Bangladesh Demographic and Health Survey also show the persistence of economic disparities in education. Although the gap in attainment between children from the wealthiest 20 percent of households and those from the middle 40 percent narrowed between 1993 and 2004, the gap between the middle and the poorest 40 percent widened (figure 7.4).

Figure 7.4. Grade attainment among 15- to 19-year-olds in Bangladesh, by household economic status



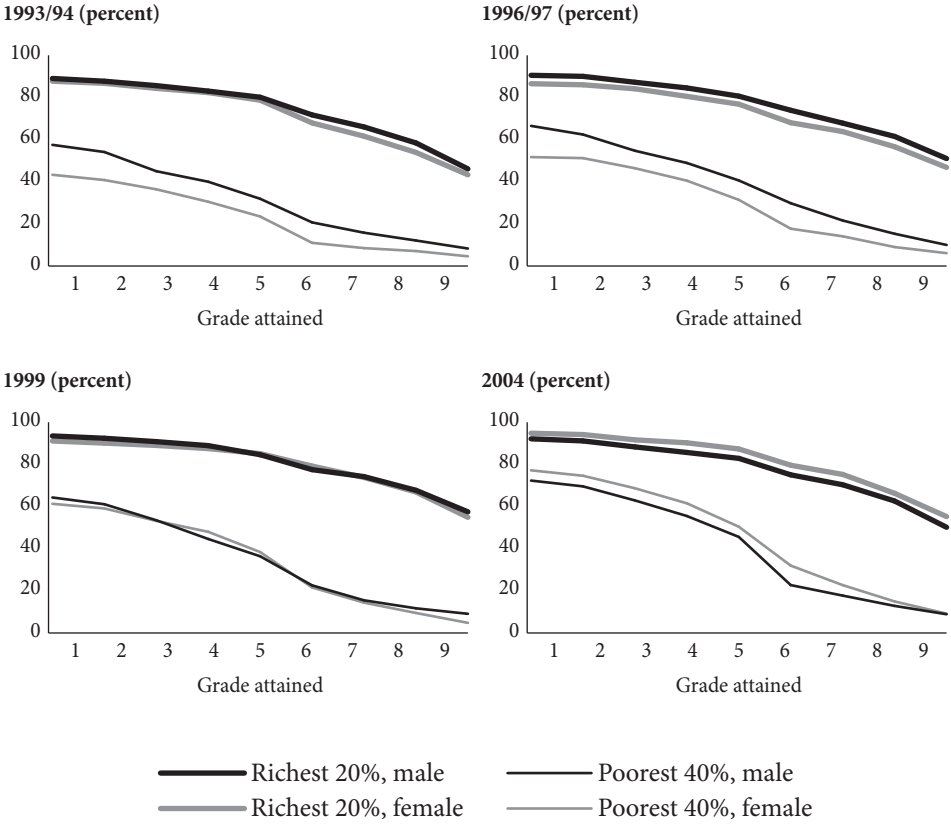
Source: Academy for Educational Development and World Bank analyses of Bangladesh Demographic and Health Survey data.

Poverty and gender do not appear to interact to create greater disadvantage for girls from the poorest families. In fact, among the poorest 40 percent of households, levels of educational attainment are now higher among girls than among boys, a change since the mid-1990s (figure 7.5).

Recent assessments have been conducted by the Academy for Educational Development (Wils, Carrol, and Barrow 2005) and the Campaign for Popular Education. They attribute Bangladesh's progress in increasing access to primary school during the 1990s to the targeting of programs by government and nongovernmental organizations (NGOs) to rural children, particularly rural girls.

Research suggests that gender disparity in education becomes less pronounced as income rises (Herz and Khandker 1991; King and Hill 1993; Schultz 1987). Because

Figure 7.5. Grade attainment among 15- to 19-year-olds in Bangladesh, by gender and household economic status



Source: Academy for Educational Development and World Bank analyses of Bangladesh Demographic and Health Survey data.

it would take many years for income growth to reduce gender disparity in most developing countries, however, it is important to determine whether this could be accomplished more quickly through policy interventions (Khandker, Pitt, and Fuwa 2003). A variety of policies, programs, and secular trends underway since the late 1980s appear to have had a dramatic effect in increasing educational participation and eliminating the gender gap in Bangladesh, at least among younger age groups. Supply-side factors have clearly played a role, but with the possible exception of the female secondary school stipend program, it would be difficult to isolate the effects of any single policy or social factor in these changes. Qualitative data, described in a following section, suggest a synergism among them.

Policy and program interventions in the education sector

The government of Bangladesh established a policy of free and compulsory primary education in 1990. In 1992 it started a project designed to institute reforms advocated by the Education for All movement, with support from the World Bank, the Asian Development Bank, and a number of bilateral donors. Through this project the government built new schools, rehabilitated old ones, developed new curricula and textbooks, and introduced other reforms. The government now operates about 38,000 primary schools (GroundWork Inc. 2002a).

NGOs have also been very active in promoting basic education in Bangladesh. Many nongovernmental primary schools were operating even before the government's network of primary schools was in place; in 1991 the government encouraged the establishment of more of these schools. Those that are registered receive textbooks and salary support from the government (GroundWork Inc. 2002a).[1]

One of the country's largest and most prominent NGOs, Bangladesh Rural Advancement Committee (BRAC), started a rural education program in 1985; by 2004 it had established more than 31,000 primary schools (in which about 11 percent of the country's primary school children are enrolled), as well as 16,000 preprimary schools. BRAC is known for its innovative teaching methods and its use of creative strategies to enable girls from the poorest rural families to attend school (flexible hours, schools located close to children's homes, involvement of parents, the teaching of practical skills) (BRAC 2005; Wils, Carrol, and Barrow 2005).

Other policy measures employed since the early 1990s to address poverty- and gender-based differentials in access to education include food for education programs; secondary school stipends for girls; screening of curricula and textbooks for gender bias; affirmative action measures, which nearly doubled the number of female teachers recruited; and a variety of communications initiatives. A government food for education program started in 1993 provided 15 kilograms of wheat and 12 kilograms of rice per month to 2.28 million children (20 percent of primary school pupils) in rural areas. Attendance rates increased substantially after the program was introduced. A 1999 Campaign for Popular Education (CAMPE) assessment found little significant difference in attendance between program and nonprogram schools, however, and highlighted a number of flaws in the targeting of the subsidies (GroundWork Inc. 2002b; World Bank 2003a). The program was subsequently abandoned in favor of monetary stipends, which were increased in size in 2002 and targeted to both boys and girls in poor families throughout rural Bangladesh. Households of qualifying pupils

1 To become registered, private schools must meet several criteria, including a minimum number of students and teachers, acquisition of a plot of land, and provision of service for at least two years. Once registered they must follow the curriculum established by the government. The government provides textbooks and 80 percent of teachers' salaries. A new school cannot qualify if there is already a school within a two-mile radius (GroundWork Inc. 2002a).

receive 100 takas (about $1.75) a month for one pupil and 125 takas a month for more than one pupil (World Bank 2003a). Participants in a study by the author frequently mentioned the secondary school stipends as a factor influencing parents' decisions to send daughters to school, but they did not mention the primary school stipends, which may not have been in place in the study communities before 2005.

The government's secondary school stipend program, begun on a pilot basis and expanded nationwide beginning in 1994, provides funds to participating schools in rural areas. The program is intended in part to delay marriage and childbearing. Small monetary stipends are provided to girls in grades 6–10 who remain unmarried, maintain a 75 percent minimum attendance rate, and achieve a score of at least 45 percent on yearly examinations (GroundWork Inc. 2002b; World Bank 2003b). Annual stipends initially amounted to $18–$45 per student but were reduced to $5–$16 by 2001. The funds are intended to cover full tuition and lodging, examination costs, and an increasing proportion of school fees, textbooks, stationery, uniforms, shoes, transport, and kerosene for lamps (although rural parents in the author's study sites typically said the amount was insufficient to cover all of these costs). A recent analysis based on two cross-sectional household surveys in a set of villages finds that the stipend program increased girls' secondary education substantially and had no discernable effect on diminishing the enrollment of boys in school (Khandker, Pitt, and Fuwa 2003).

A variety of community mobilization and mass communications initiatives have been undertaken to encourage female school attendance and combat the gender-related norms and attitudes that have traditionally inhibited girls' school participation. These include both national-level campaigns and school-level projects. One example is the Female Education Awareness Program, supported by the World Bank, through which the government implemented a variety of communication initiatives to encourage secondary schooling for girls. The program used a mix of communication channels (radio, television, print materials, and face-to-face communication) to disseminate messages to fathers and older men in rural communities and to motivate female teachers and other school officials to understand and implement the girls' stipend program and to engage in outreach activities with parents (Cabanero-Verzosa, Middlestadt, and Schuwartz 1993).

Another communication effort is the Meena Communication Initiative, funded by UNICEF and other donors. This initiative uses a girl cartoon character to raise awareness among teachers, parents, and school children of gender inequality and the human potential of girls, through television and radio programs, films, print materials, and cultural events (GroundWork Inc. 2002b). In one episode a boy and his sister trade places for the day after an argument over food in which their grandmother defends her favoritism of the boy on the grounds that his work is harder. The girl has a pleasant day wandering the fields with the family's cattle while her brother struggles to perform household chores. In other episodes the girl uses her wits and educational skills to help her family—by reading the instructions on a package of seeds, for

example, or checking the accounting in a bill of sale and discovering that her parents have been cheated. Behavior-change communications aimed at increasing gender awareness and encouraging girls' schooling have been very widely disseminated in Bangladesh, but no impact studies are available.

Policies, programs, and opportunities for women in other sectors

The case of Bangladesh suggests that policies and secular trends in sectors other than education can also have an impact on female education, particularly those that influence gender roles and aspirations for women. Massive efforts were made in the health sector during the 1980s and 1990s to promote high-impact primary health care interventions, such as oral rehydration, child immunization, and family planning. As part of these efforts, from 1978 to 1997 the government hired and trained married women to distribute contraceptives door to door and encourage rural couples to practice family planning. Most of these women worked in their own or nearby villages. As many as 28,000 of these workers were employed at any given time throughout the country; roughly three-fourths of them worked directly for the government, with the rest working for NGOs (Phillips and Hossain 2003).[2]

NGOs have been active in Bangladesh over the past quarter century, particularly in rural areas. The official count of NGOs as of mid-2001 was 23,623, with 36 operating nationally (World Health Organization Southeast Asia 2004). These organizations have provided opportunities for rural women through formal and nonformal education, health, skills training, legal and political awareness raising, and microcredit. About 22 million rural women in Bangladesh are involved in microcredit organizations (World Bank 2004), the great majority of them nongovernmental. The garment industry, established in 1983, employed 240,000–600,000 women by the mid-1990s (Bhattacharya 1996; GroundWork Inc. 2002b). Both microcredit and garment work have benefited large numbers of Bangladeshi families, in the process helping alter gender boundaries in families and communities.

Qualitative data sources

The author's research project on intergenerational relationships, gender, and marriage in rural Bangladesh included two sets of interviews that shed light on the evolving perceptions of and demand for female education. The first set included 55 in-depth

2 Contraceptive prevalence in Bangladesh increased rapidly, from less than 8 percent in 1975 to more than 50 percent in 1999/2000, and the total fertility rate declined from more than six to a little more than three children per woman between the late 1970s and the early 1990s (NIPORT, Mitra and Associates, and ORC Macro 2001).

interviews (3 with men and 52 with women) and 14 group discussions (2 with men and 12 with women), conducted between 2001 and 2003. These interviews aimed to explore qualitatively the influence of policies and programs on gender relations at the household and community levels. The second set, conducted between 2002 and 2005, included 117 in-depth interviews (35 with men and 82 with girls and women) and 4 small-group discussions with girls and women. These interviews addressed the factors influencing the timing of marriage and childbearing, issues closely linked with female education.

The interviews were conducted by a team of three female Bangladeshi researchers and one male Bangladeshi researcher, all with extensive training and experience in ethnographic research methods. The long duration of the research in these sites enabled the field researchers to develop considerable rapport with residents of the study villages. The researchers used a combination of tape recordings and field notes to generate written transcripts in Bangla, which were translated into English and coded thematically by the investigators.

The sites were three villages (two in Rangpur District in northern Bangladesh and one in Magura District in the west central region) with a total population of about 4,000. No particular characteristics distinguish these villages from others in Bangladesh (Bates and others 2004). When the research began in 1991, there were few opportunities for women's employment or social participation outside the home. A vigorous family planning program was underway and reproductive norms were starting to change, but contraceptives were delivered door to door by female workers, so that family planning could be promoted without confronting the norm of female claustration. Microcredit programs had been established in two of the villages (and, within a few years, all three), and rice-processing centers near two of the villages employed a few women.

Since that time the villages have been exposed to many additional influences that appear to be reshaping ideas about gender as well as perceptions and behavior related to female education. These influences include direct promotion of girls' education, voter participation campaigns, promotion of health and family planning services outside the home, and mass communications aimed at reducing son preference and gender-based discrimination. Employment opportunities have also expanded somewhat. Although gender inequality still prevails in almost all spheres of life, change is apparent in these villages, especially in terms of women's physical mobility, concepts of women's roles and potential, and the perceived value of female education.

Evolving gender norms

The data reveal the widespread perception that women are changing—that they are better educated, better informed, more daring, and more resourceful than they used to be. Study participants described some of the women in the three villages as well

informed about the world and able to move about with confidence in public space, contribute to household income, secure employment, or prosper economically through self-employment. They described certain women as articulate, confident, logical, and persuasive in speaking with their families and with strangers. While some study participants, especially men, showed ambivalence about this new "smarter" type of woman, their remarks were mainly positive.

The descriptions of women's changing nature and the positive valuation of women who were able to talk persuasively, work outside the home, and interact in the public sphere are striking in light of traditional gender norms. Even a generation ago, men in Bangladesh were responsible for virtually all dealings with the world outside the family, as they still are in many families. Submissiveness and modesty were highly valued in women and still are in most contexts; men's use of violence against their wives continues to be widely condoned in cases where women are viewed as disobedient. Traditionally, Bangladeshi women did not conduct business transactions or interact with formal institutions, and this is still the case in many families. More traditional and hierarchical gender roles persist in some families and, even in families where women have become more dominant and influential, this is typically not the case in all spheres of their lives. Nonetheless, an evolution in women's roles and aspirations is very apparent.

Study participants explained the changes they had observed in women's nature and behavior both in terms of adaptation to economic, environmental, and social stress and as a response to new opportunities and resources, such as microcredit, health and family planning services, and education. Although a number of the individuals identified as "smart" women by study participants were illiterate women involved in NGO programs, many described the emergence of the "smart woman" and the advancement of women in general as a result of girls' access to education. The "educated" type of smart woman was accorded higher status (Schuler and others 2006b).

Changing norms regarding girls' education

Many interviews from this research project illustrate how changing ideas about women's roles and potential are increasing demand for female education and educated women. A retired illiterate rickshaw driver spoke about how his illiterate wife had to work to obtain his release when he was imprisoned on a false murder charge. He said that various people had cheated his wife without her realizing it. This experience had made him realize the importance of educating his children "so that no one could outwit them." The man said that it was impossible to secure employment in the public sector without paying a bribe and that he intended to arrange a job for his daughter once she completed her education, even if he had to pay, just as he intended to do for his sons.

His daughter was asked if she had a specific objective in attending school or did so only because everyone else did. Smiling, she replied "Apa [sister], when you are

educated you become *koto boro* [such a big shot]. I want to travel around the whole country once I have an education. . . . I'm on track. I hope to pass the SSC [secondary school certificate exam], then get myself admitted to college and then university."

The girl's adult brothers were now supporting their father at a higher standard of living than the family had had when the children were growing up. The father's interest in educating his daughter seemed to arise primarily out of concern for her own future. A substantial minority of parents interviewed also expressed the hope of receiving support from their daughters if the daughters could be educated enough to become employable. This is especially noteworthy given the persistence of son preference and the traditions of patrilineal inheritance and exogamy. In most but not all cases, the parents who invested in their daughters' education in the hope of receiving financial support from them lacked sons or had sons who were doing poorly in school or had left school after completing only a few years.

Discussions about desirable qualities in a wife or daughter-in-law and accounts of marriage decisionmaking showed a growing demand for educated brides. Many parents felt that educating their daughters would improve their chances of marrying well and being treated well in their marital homes, as well as making it possible for them to work and support themselves if something went wrong in their marriages. A young married woman explained, "Nowadays illiterate girls who have not gone to school have no value. When they visit a girl's house to see the [prospective] bride, the bridegroom's side first asks her parents about her educational level. If a girl is not educated, even an illiterate man would not want to marry her."

Many study participants also said that educated mothers could help their children with their studies, in some cases obviating the need for private tutors. Many parents believed that their children had little chance of passing exams for secondary school or attaining good scores without private tutoring.

Spread of the female education norm

With the cost of girls' education offset by government stipends, there were many cases in which younger daughters were permitted to stay in school past the age at which their older sisters had been married off. Many parents had begun sending their daughters to school mainly because other parents were doing so, implying that a critical mass, or "tipping point," for normative change may have been reached in these communities. A young mother of a five-year-old girl said she planned to send her daughter to school soon and would keep her there at least through the fifth grade. Even after the interviewer probed for further information, the woman said nothing about the potential benefits of education. She said only that all of the parents in the community were sending their children to school, so she would do the same.

A recently married 18-year-old talked about changing norms when asked why her parents had delayed her marriage while her older sisters had been married at ages 12–15. "My father thought it was unnecessary for girls to read and write, but in my

case he did not object. . . . None of my peers were sitting idle at home, so I also went to school. Now it is better for girls. They don't have to pay fees—the government finances it. . . . Everyone has had some schooling, at least up to the eighth or ninth grade. No one would want to marry an illiterate girl, so they are sent to school."

Although some questioned the quality of the education their children were receiving or wondered whether education really would lead to employment, virtually no one in the study questioned the value of education for girls. Their main reservations had to do with the costs of schooling and the potential dangers of mixing with boys.

Importance of role models

The influence of role models was apparent in many parental decisions regarding children's education. Study participants talked about the attributes and lifestyles of people who were better off, characterizing wealthy women as gentler and more refined and wealthy families as less violent and more harmonious. They hoped that education would enable their daughters to attain these qualities and lifestyles, as well as find employment and support their parents.

One example was a rickshaw puller who worked in the district town. "I was poor, and [in those days] nobody like me could even think of educating his children," he explained, "but I dreamt I would educate mine when I saw the students in front of their schools. I used to carry the daughter of a *daktar apa* [female doctor] to and from her school. That *daktar apa* had such a nice manner! Educated people are usually well behaved, and they talk differently. We illiterates do not even know how to talk. So I dreamt of getting my children educated." His wife added in a separate interview, "One of my brothers-in-law is an educated person. He has a job in a government [grain storage facility] and is very well off. His example, too, made me want to get my children educated." One son had completed high school and the other had completed college. Both had found low-level but (in the eyes of this family) reasonably well-paid jobs in Dhaka. One daughter was in the 10th grade; the other had recently failed her high school matriculation exam and was therefore about to be married. "I do not feel sorry that she failed to pass the exam. I think it was a great accomplishment for us that she could study as far as she did," the girl's mother said with a happy expression.

One woman interviewed had a niece who had completed secondary school and then trained as a nurse. The niece had used her earnings to rebuild her parents' house and help her father buy land and her two brothers get jobs. No dowry was demanded when she married. Concerned about her own family's future, the aunt encouraged her own daughter to study in the hope that she too could become a nurse. Her two sons were indifferent students. She hoped her daughter could eventually help the family financially and also believed that education would enable her daughter to find an educated husband who would treat her well.

A woman with no sons told the interviewers, "A girl in that village [across the road] has a job with BRAC [a prominent NGO]. I've heard that many girls nowadays are getting jobs. Seeing and hearing this, we are educating our daughters."

Asked what had inspired her to send her daughters to school and support the continuation of their education, the mother of a recently married 20-year-old woman explained that her neighbor's daughter had gotten a job as a supervisor in a textile mill in a nearby town after passing her secondary school examination. The girl had then arranged jobs for her brother and sister in the same mill. She later married a fellow mill employee, and her parents were not obliged to provide a dowry.

Another mother, determined to educate her daughter, said, "As my younger sister is a school teacher, the marriage proposals that are coming for her are not tied to demands for dowry." Kabeer (2001) quotes a young garment worker in Dhaka as saying, "How can they ask for dowry to marry us? We are the dowry."

Re-evaluation of life choices

Many study participants reinterpreted past decisions or said their lives might have been better if they or their children had continued in school (Schuler and others 2006a). Many parents and siblings, including women who themselves had been married at a young age, had resolved to delay marriages of daughters or sisters and to encourage them to continue their studies. In several cases siblings lobbied on behalf of their younger sisters, and a few had provided economic assistance to help them stay in school. A 17-year-old who had been married at 15 said, "I couldn't get an education and had to work as a maid in another's home, so I was made to marry, but I've told my sister to get an education. My mother got her admitted to the BRAC school."

Local perspectives on policy and program interventions

The nature of study participants' exposure to interventions promoting gender equity and girls' education and discouraging early marriage and childbearing was explored directly and indirectly. Villagers were asked how they knew about the minimum legal age for marriage and the disadvantages and risks associated with early marriage and childbearing when they mentioned them in explaining their own strategies and decisions. The most frequent sources of information mentioned after "others in the village" and "own experience" were radio and television programs. One such program, called "Happy Family," (originally developed to promote family planning) was, according to one high school girl, "broadcast so often that people listened to it whether they wanted to or not." Study participants also mentioned their health and family planning workers, who reinforced the messages broadcast through mass media and encouraged parents to educate their daughters. In some cases health workers held discussions with groups of women about the disadvantages of early marriage, stressing family strife as

well as health risks. A woman whose daughter had been married at the age of 19, after completing the 10th grade, recounted, "That health worker-apa showed us a picture one day and said that when a girl is married at an early age, then she becomes sick (as in the picture) during her birth delivery, and the baby as well as the mother may die during the delivery. Besides that, the family is submerged in unrest and the husband-wife relationship deteriorates. They always quarrel and argue with each other. And the wife does not recover easily from illnesses. If she recovers from one illness, she becomes sick with another. I can still remember her words clearly."

The influence of the government secondary school scholarship program on parents' decisions to keep daughters in school beyond the primary level was obvious; many girls in the three villages would not have been able to continue in school without this financial support. One of many examples of this influence was an account by an impoverished father who said he felt humiliated because of his own illiteracy and poverty. "I can't meet my children's desires. I can't give them three meals a day, let alone give them anything beyond the bare necessities. I can't even buy a sari for my wife," he told the interviewer. "But without spending much money, I can at least fulfill their desire to learn [because of the secondary school stipends]."

The government actively promoted the stipend program in the three villages and encouraged girls to remain in school, drawing on familiar negative scenarios from rural life to make the point. A 17-year-old girl in the 10th grade said that "government people" often came to her school in connection with the stipend program. "Sometimes a woman officer comes too. She talks neatly, [pointing to the interviewer] like you. She asks us to get educated. She tells us that if a girl is educated, her husband cannot torture her." Asked to clarify what she meant by "torture," the student continued, "Husbands often beat and scold their wives for nothing. To get dowry, they beat their wives and force them back to their fathers' homes, but if wives are educated, husbands are usually afraid to do such things."

Local officials appeared to exercise some discretion in setting out the parameters of the stipend program. According to two female students in one village, if a student's attendance fell below 75 percent, he or she had to provide a letter stating the reason for the absence, pay a fine of five taka a day, and receive five strokes of the cane. In addition, to receive the stipend female students had to remain unmarried. These girls believed that early marriage was a punishable offense and that a girl could file a civil suit against her parents if they tried to get her married before she completed the 12th grade.

In one village, school children were lectured on the legal and human rights and the health aspects of early marriage and childbearing, and girls were given posters to place on the walls of their homes. One girl proudly showed the interviewer two posters on the wall of her family's house. One poster read, "One is not old at 20, so do not marry before that age," the other read "Do not delay—send your daughters to school today." Asked whether everyone was able to read these posters, the girl explained that all children studied at least up to the fifth grade and could therefore read the posters out loud to

adults. (As if to illustrate the point, several children who stopped by the house while the interviewer was there proceeded unprompted to read out the words on the posters.)[3]

The stipend program and related efforts to encourage girls to enroll and stay in school (as well as to discourage early marriage and childbearing and reduce gender inequality) have influenced parents' aspirations for their daughters. These policies have also influenced girls' own aspirations and, in some cases, their sense of their rights and entitlement. One mother was interviewed while tending goats. Two of the goats belonged to her sons and were purchased with the sons' own earnings; the third was purchased by her daughter, using the funds from her educational stipend. The daughter then prevailed upon her parents to buy her books and school supplies with their own money, arguing, according to her mother, "As parents, it was your responsibility to incur my educational expenses. Why should I spend my money? You should buy me a goat in exchange for the money I have spent from my stipend to buy the books and notebooks." "Look, Apa," her mother told the interviewer, smiling, "It is dangerous to get my daughter educated, because she has learned well how to safeguard her own interests!"

Villagers thought about policies and programs and developed their own ideas about both the government's motivation and the programs' impact (Schuler, Bates, and Islam 2001, 2002). Asked his opinion about the government's rationale for promoting delayed marriage of girls, one father replied, "The government has established so many schools and colleges for the girls and provides them education free of cost. If the girls are married early, then who would study in all these schools and colleges?" He later added, "You [the female interviewer] are now doing a job because you have educated yourself well. . . . Many girls from our village are going to Dhaka to get jobs in garment factories. All of this has been possible because of education."

The illiterate mother of two sons and five daughters whose daughter used her stipend to buy a goat speculated that the scholarship program was related to population and environmental concerns. "Were it not for the government's girls' stipend program," she told us, "girls might all have had to sit idle at home. Their parents might have bought some goats for them to rear so they could be married with the sale proceeds. Think about it, Apa, how many goats would there have been in our village in that case! The goats might have spoiled all the farms, and then what would all the Bangladeshi people have eaten?"

Family strategies regarding female education, employment, and marriage

The three villages have undergone changes in social norms and norms concerning women's employment and marriage over the past decade or so. These changes can be

3 The young woman added that some students used the posters to make book covers rather than putting them up on their walls, because their families felt the display of photographs or drawings of human beings was un-Islamic.

seen in study participants' explanations of their strategies and decisions regarding the education of daughters.

Women's income and power within the family

When we began our research in the three villages in 1991, there were few opportunities for women to earn incomes in or near their rural communities. Modest but important changes evolved as microcredit organizations for women expanded and men allowed their wives and daughters-in-law to leave the home to gain access to the financial resources these organizations offered.

About 22 million rural women in Bangladesh are involved in microcredit organizations (World Bank 2004). In the three research villages, 20 percent of married women under the age of 50 belonged to such organizations in 1994; by 2002 the figure had risen to 38 percent (another 11 percent were former members). Microcredit helped draw women out of their homes and into the public sphere, as members are typically required to meet weekly and interact with mostly male program officials. It also increased their ability to generate cash incomes. Even when loans were handed over to husbands for investment, there was usually some recognition that the money was available to the family because the woman had officially taken the loan (Hashemi, Schuler, and Riley 1996; Kabeer 1998).

During the 1990s many of the women who belonged to microcredit organizations, as well as some who had been left out or had excluded themselves because their poverty made them appear as likely defaulters, took up various types of income-generating work. Using data from a 1992 national survey of women in villages with and without microcredit programs, we constructed an index of eight indicators of women's empowerment, measuring such dimensions as economic security, involvement in household decisionmaking, and freedom of movement. We found that women who said they made substantial contributions to their family's support were more than seven times as likely to be empowered as those who did not and that women who both contributed and belonged to microcredit organizations were more than twice as likely to be empowered as those who merely contributed (Hashemi, Schuler, and Riley 1996).

Qualitative data also show that earning an income can bring about positive changes in women's lives. In the very poorest families, men sometimes deserted their wives and small children for long periods, and the women's impoverished relatives were often disinclined or unable to take them in. When these desperate women began earning, husbands returned (for better or worse), and the women also had greater options for living with natal relatives. Many women in more stable situations also achieved recognition for their contributions to family well-being, in a setting in which noncash domestic contributions are typically undervalued, as well as a greater sense of self-worth. As women helped one another gain access to employment or health and other services, the role as intermediaries became another source of social recognition and personal fulfillment (Schuler, Bates, and Islam 2002).

Thus it appears that women's social capital increased during the 1990s, despite only modest economic improvements in most rural communities and the persistence of extreme gender inequality in almost all aspects of life. A similar phenomenon has been documented among young women working in the garment industry in urban areas (Kabeer 1991, 2001; Amin and others 1998). Unlike garment workers, who are usually required to have at least a few years of education, the majority of the women in credit programs and those earning cash income in our research villages had no education. In our 1994 survey 83 percent of women in microcredit programs and 73 percent of those earning cash income had no education.

When we compared data on women's engagement in income-generating work in 1994 and 2002 in the three villages, we were surprised to find that only 40 percent were earning in 2002, compared with 65 percent in 1994. In qualitative interviews many women who had previously worked outside the home (in rice-processing centers, on road maintenance crews, or as vendors) said that the unskilled work was extremely physically taxing and that they had lost their strength and health as they aged. Others had stopped working because they were no longer desperate for the income or willing to compromise family prestige and undermine the chances of arranging desirable marriages for their children, many of whom had by then reached marriageable age.

Growing aspirations of and for young women may explain why few younger women have stepped in to take the place of the older women who left their jobs. Whereas microcredit and unskilled labor used to be seen as virtually the only options for women to increase their perceived value and influence within their marital families, education potentially provides a more attractive way for young women to enhance and secure their positions. Many of the mothers who were involved in microcredit programs or unskilled wage employment initially began to work out of desperation. They found the work both exhausting and socially demeaning, even though it gave them personal satisfaction, social skills, and networks. Many later came to believe that the options available to their daughters through education would be better. In a number of cases, husbands and mothers-in-law had forbidden young married women to follow in their mothers' footsteps by working outside the home out of concern for family prestige.

Marriage strategies

The marriage of daughters tends to be a matter of extreme, even obsessive, preoccupation in rural Bangladeshi families, especially among the poor, as Arends-Kuenning and Amin (2001) observe. In our study sites, several women with daughters of marriageable age stopped working in rice-processing centers out of concern that the stigma associated with that type of work would diminish their chances of negotiating favorable marriage alliances for their children. One such woman said she had done this work for more than seven years and that her son, then in his late teens, had begun

working as a bicycle "van" driver. He convinced her that the family would be better off subsisting on his income alone because marriage proposals were starting to come in for his 15-year-old sister.

In another case a mother gave up her work in a rice-processing center for fear of creating complications for her recently married daughters. "I do not do work in the *chatal* [rice-processing center] now because I've gotten both my daughters married into good families," she told the interviewer. "I do not do work in the *chatal* because my daughters might lose their prestige. People will taunt them, saying, 'Your mother is working in a *chatal* and good women do not work in *chatals*.'" Although these examples all involve work in rice-processing centers, women who performed other types of unskilled labor outside the home, such as road maintenance, were subject to similar disapproval because of the contact with men that such work entails.

The following case also illustrates how decisions regarding the education of daughters are often linked with economic strategies and social aspirations. In a society in which cousin marriages are viewed as normal, a 17-year-old girl was very upset because her aunt (the wife of her mother's brother) saw her family as socially inferior and forbade her male cousin to marry her. According to the young woman, "When that boy told his mother that he wanted to marry me, she replied, 'I would never bring a rickshaw driver's daughter as my daughter-in-law.' I was deeply hurt by that comment of my aunt. My father may be a rickshaw driver, but does that mean he is not a human being?" The girl's mother was also offended. "We do not know how to read and write," she told the interviewer. "We are illiterate, and nobody values us. Only educated people have value in society. And nowadays illiterate girls cannot get married to a good boy. . . . My husband is a rickshaw driver, and many people say to us, 'How good a boy will you get for a girl who is a rickshaw driver's daughter?' But I am sure that when she passes the IA [intermediate exam], nobody will brand her as a rickshaw driver's daughter. . . . If I can manage to get her through the matric [matriculation exam] and if she can manage a job in a garments [garment factory] in Dhaka and earn 2,500 to 3,000 takas [about $40–$50] a month, people will take her as their daughter-in-law seeing her monthly salary. I will not have to pay any dowry."

"I have a piece of land," she continued, "but if I sell that for her dowry, then what will happen to my son? I would not be able to bring him up well. He is illiterate. I have to do something for him, so, I am educating my daughter. Then she can get a job, and we can marry her without paying dowry. . . . I am seeing everywhere in the neighborhood that sons do not look after their parents but the daughters do. My husband still drives rickshaw because he has the capacity to do that. But what will happen when he loses his ability to work? If we can manage to do something now that would provide for our future, then we will not need to worry."

Another mother explained, "If my daughters did not have any education, then I would have had to marry them to van pullers or cobblers. . . . If I married my daughter to a van puller or a cobbler, she would have to begin each day being tortured physically

by her husband and go to sleep at night again being physically tortured. These people do not have any sense of gentleness. But if a girl gets a husband with an educational background, there will be no quarrels or physical torture, and the girl will be happy in her married life."

Another mother was frustrated because her daughter had failed the secondary school certificate exam. She was trying to persuade the daughter to resume her studies so that she could eventually pass. She hoped that her cousin, who worked in the government nutrition department, could arrange for her daughter to get a job providing nutritional supplements to pregnant women in her village. The daughter could then marry well without a dowry, which the family could not afford. The mother explained with tears in her eyes, "My own home is like a hell on earth. . . . If I had been educated, I would have been able to feed myself by getting a job, and I would not have had to tolerate this oppression. I would have left this place and returned to my father's house with my daughter and my son. . . . The smallest thing out of place and [my husband] begins scolding and beating me. I have learned from my own life!"

A father trying to educate his three daughters and five sons shared several stories of female education resulting in desirable marriage alliances. "One of my cousins who has a B.A. married a college professor. One of my nieces, who was studying for her B.A., was married to a *madrasa* [Islamic school] teacher. Another niece was married to a boy who works for a company in Dhaka. With education, girls can easily be married off to educated boys with jobs, and they can have happy lives."

A 17-year-old girl told us with enthusiasm, "If I can get a proper education, I can get a good, educated boy as my husband. He will be able to get a job, and I can live in a good environment. . . . What I mean is an educated environment. I can live in a town." She cited the example of her cousin, who had passed her intermediate exams, married a man with a bachelor's degree, and moved to the district town.

The increasing value given to female education is also becoming evident in women's strategies regarding their sons' marriages. One study participant said she and her husband had not been able to educate their children because of their extreme poverty—and, by implication, because they did not recognize earlier the potential value of education. Although illiterate, she was intelligent and determined and managed to improve the family's economic condition through her own efforts. She had taken up a variety of income-generating activities and persuaded her husband and her sons, when they got older, to take on various jobs and make a series of small investments, which later paid off. "Everything you see in this house was created by me," she said with great pride. "My husband is not so intelligent, so I have had to look after everything, and my sons are like their father, so I have to look after their interests too." She explained sadly that her educated daughter-in-law had left her illiterate eldest son. "I chose her and took her into my home, because I thought my family would prosper if my daughter-in-law was an educated girl. She was very intelligent. I behaved very well with her and arranged things to accommodate her likes and dislikes. . . . I had thought

that if we had an educated girl as a daughter-in-law we would get good counsel from her. . . . but she did not want to live with us." Appeals to a local official and the girl's father to persuade her to return failed. Despite the humiliation her family suffered as a result, the mother was more wistful than bitter. "Every household needs such a girl as their daughter-in-law. . . . If she came back even now, I would welcome her into my home."

While most study participants maintained that they would have to provide a larger dowry if they educated a daughter beyond a certain point because she would have to marry a young man with equal or higher education, virtually every respondent said that education had become a valuable asset in a girl and the lack of education a disadvantage for employable girls (see Arends-Kuenning and Amin 2001; Kabeer 2001). Although relatively few girls in the three villages had jobs that required education, as many of the previous examples illustrate, a few successful role models can have a powerful influence on aspirations and decisionmaking.

Limits and precariousness of changes underway

In counterpoint to the optimism displayed in so many of the study participants' statements, other themes in the interview transcripts highlight significant barriers that remain in the evolution toward greater gender and economic equity in educational participation and achievement in Bangladesh. For example, even with the secondary school stipends, many of the most economically stressed families found it difficult to bear the full costs of their daughters' educations, especially as their daughters entered their middle and late adolescence. Many girls, as well as boys, drop out at the primary school level, despite the incentive for parents to keep daughters in school long enough to benefit from the secondary school stipends. As the CAMPE study documents, even "free" education costs money. The average parent in that study paid nearly as much annually per student as did the government. Their costs included textbooks and notebooks, private tutors, examinations, admission/readmission, and other fees (GroundWork Inc. 2002a). Lack of transparency has been identified as one important cause of this economic burden on parents, with 80 percent of respondents in the CAMPE study reporting that they paid fees for events such as examinations and games and nearly all reporting that they paid for textbooks (GroundWork Inc. 2002a). In our study, parents mentioned transportation costs, clothing (many felt that school demanded a higher standard of dress than their children would normally wear at home), tutors, and exam fees. Many parents felt that private tutoring was essential for their children to have a reasonable chance of passing their exams.

Indeed, poor-quality instruction and large class sizes have been found in a number of studies (GroundWork Inc. 2002a; World Bank 2003a; Ahmed and Nath 2005), including one by Education Watch that found private tutoring, often by primary

school teachers themselves, has become common practice. Forty-three percent of the students in the study areas employed private tutors, with proportions increasing with grade level, family economic status, and the presence of sons (Ahmed and Nath 2005). The same study finds that verbal and physical abuse of students is a common occurrence, in some cases causing students to leave school permanently (Ahmed and Nath 2005).

In addition to the monetary costs to parents and the physical and psychological costs to female students, the perceived risk associated with keeping adolescent daughters in school and unmarried was a recurrent theme in our interviews with parents. Sex outside marriage is considered immoral and shameful in Bangladeshi society, especially for girls. Once girls reach menarche, they are seen as dangerously seductive and vulnerable to men's predations. Even unsubstantiated gossip regarding a sexual liaison can harm a girl's marriage prospects and result in increased dowry demands (Schuler and others 2006a). Poor parents see themselves as less able than wealthier parents to protect their daughters from premarital sex and scandal. The scarcity of employment opportunities, especially in rural areas, reinforces the social dependence of women on marriage.

Conclusions

Women in Bangladesh understand very well that their expanding roles and capabilities are developing in a context in which men still dominate in most spheres of life and that women generally lack property rights and control over income (Schuler and others 2006b). The absence of social and economic alternatives to marriage for women compound these perceived risks. As a result, many parents experience great anxiety when they postpone a daughter's marriage to enable her to stay in school (Schuler and others 2006a).

The hope and optimism about the future expressed by so many parents and daughters in speaking about their life strategies, and the roles of education and employment in these strategies, are particularly striking in light of the few women from the study villages who hold the types of jobs these families aspire to for their daughters and the scarcity of such jobs, especially in rural areas. The many statements that bribes must be made to obtain such jobs, especially in the government sector, reveal a related barrier that poor families must consider when weighing the costs and possible benefits of keeping a girl in school. These ongoing constraints notwithstanding, the case of Bangladesh offers important lessons regarding the potential to create synergies among policies and programs across sectors such as health, education, and civil society and governance.

The data suggest that a pattern of reverse causality (Lloyd 2005), or a "virtuous circle," is emerging between female education and increased gender equality and that

policies to promote gender equality and discourage early marriage can have an impact on education. Changing ideas about gender (what makes a good wife and daughter-in-law, how women can best contribute to their families, how important it is for married women to be able to support themselves if something goes wrong in their marriages) are increasing demand for female education, as scholarships bring girls' education within reach of lower economic groups and the marriage market shifts in favor of brides with more education. Increased education among young wives, in turn, is influencing how people think about gender and age at marriage. Because it is socially unacceptable in Bangladesh to keep unmarried adolescent girls home unless they are in school, interventions to keep girls in school can help delay marriage and childbearing. Policymakers and program designers have been able to build on this synergy. One hopes that additional employment opportunities for women can be created before the current optimism and willingness of economically deprived families to take chances and invest resources in female education begin to fade.

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8

Tunisia: Strong central policies for gender equity

Marlaine E. Lockheed and Cem Mete

Although economic returns to basic and secondary schooling are high universally (Psacharopoulos 1985, 1994), different countries have adopted significantly different strategies for expanding schooling, with distinct implications for equity, social mobility, and economic growth. Goldin and Katz (2001) attribute part of the economic dominance of the United States to the fact that it led Europe in establishing mass secondary and higher education by at least several decades for much of the twentieth century. One difference the authors note between the United States and Europe is Europe's focus on "a small cadre of youth whose families could afford the private expense or who had scored sufficiently well on an examination taken around age 11" (p. 18). European policymakers viewed relatively egalitarian education in the United States as a waste of resources; their counterparts in the United States rejected the German system of apprenticeship training (Goldin 2001).

European countries were not the only ones that limited (and in some cases continue to limit) access to general secondary education. Many developing countries, especially those in Africa and Latin America, implement primary school-leaving examinations to determine which students will be allowed to remain in the general secondary education path (Bray and Steward 1998; Kellaghan 1992). Knight and Sabot (1990) compare the education systems of Kenya and Tanzania, arguing that Kenya's "failure" to curb secondary school expansion appears to have contributed to

higher labor productivity, lower inequality of pay, and a more equal distribution of secondary schooling.

The gender implications of selective education systems have received little attention. Studies show that girls are more likely than boys to drop out of school in Kenya (Lloyd, Mensch, and Clark 2000) and Tanzania (Al-Samarrai and Peasgood 1998), but these studies do not make explicit linkages between dropping out and performance in school, performance on the primary school-leaving examinations, and parental demand for girls' schooling. A priori it is not clear whether the selective education systems would exacerbate the gender gap in schooling (even if such systems reinforce socioeconomic inequalities in society or turn out to be inefficient due to high repetition rates at the end of each schooling cycle). In particular, if girls do not face major disadvantages in the household resource allocation process and basic education schools are not female unfriendly (that is, include such essential requirements as clean, functioning restrooms and female teachers as role models for girls), then a selective education system may not necessarily increase the gender gap in schooling outcomes.

This chapter aims to contribute to this literature by using data from Tunisia, a country that until 2000 implemented examinations to regulate passage from the sixth to seventh grade in basic education. A focus on Tunisia in the second half of the 1990s is a useful complement to the empirical literature, which focuses on Kenya and Tanzania, because developing countries that continue to implement highly selective secondary education strategies will face circumstances similar to Tunisia's pre-reform environment (with less pressure on available secondary education "seats" due to fertility transition) at some point in time. Tunisia differs from Kenya and Tanzania in another important way: its population is highly homogeneous. Tunisia's examination system, therefore, cannot reinforce discrimination based on ethnic or linguistic differences among population subgroups. Rural students are at a disadvantage, but, with a few exceptions, this disadvantage is based more on economic factors than ethnic ones.

This homogeneity may also explain the dramatic rise in education participation in Tunisia (table 8.1). Over the past half century, education participation in Tunisia has grown from a privilege of the few to the entitlement of the majority, due largely to the country's aggressive education reform policies and sustained economic growth. At independence in 1956, less than 5 percent of children were enrolled in primary school; by 2003 this share had increased to 98 percent, with essentially no gender differences in participation. Literacy for adults over the age of 15 rose from 16 percent in 1960 to 74 percent in 2004, while literacy among all 15- to 24-year-olds[1] rose from 27 percent in 1956 to 96 percent for males and 92 percent for females in 2004, equal to the net enrollment rates for primary school a decade earlier (Olfa n.d.; UIS 2005)

At the primary level, girls' participation equals that of boys, and their academic achievement is superior in some cases. On primary school-leaving examinations and international tests of achievement, girls outperform boys on language and reading

1 Data disaggregated by gender are not available for 1956.

Table 8.1. Literacy rates and net primary enrollment rates by gender in Tunisia, 1960–2004 various years (percent)

	Literacy adults 15 and older			Net primary enrollment		
Year	Total	Male	Female	Total	Male	Female
1960	16	—	—	—	—	—
1965–66	24	—	—	69	—	—
1970	27	41	15	76	—	—
1975	38	—	—	79	—	—
1980	45	58	31	83	—	—
1984–85	48	—	—	94	—	—
1990	59	72	46	—	—	—
1992	—	—	—	96	99	93
1995	65	76	53	—	—	—
1996	—	—	—	98	99	96
1999	—	—	—	94[a]	95[a]	92[a]
2000	71	81	61	94	95	94
2001	—	—	—	95	96	95
2002	—	—	—	97	97	96
2003	—	—	—	97	97	97
2004	74	83	65	98	97	98

a. Drop in rate may reflect differences in estimation methods.

Note: — indicates data not available.

Source: Lockheed and Verspoor 1990; Republic of Tunisia 1999; UIS 2006.

tests and generally perform as well as boys in math and science. Only on the primary school-leaving examination for mathematics in 1996 did girls underperform boys (table 8.2).

Moreover, unlike the pattern in many countries, the academic performance of rural girls in primary school is not below that of rural boys. However, the performance of rural children is well below that of urban children for both boys and girls (figure 8.1).

By lower secondary school, the situation changes, with emerging gender differences. First, boys who do not succeed on the sixth grade primary school-leaving examination are slightly more likely than girls to repeat the grade (Mete 2004). Second, boys and girls who do not repeat (and are therefore pushed out of the academic system) experience very different lives after primary school. At age 14, 57 percent of boys are working or looking for work, compared with 32 percent of girls; 46 percent of girls

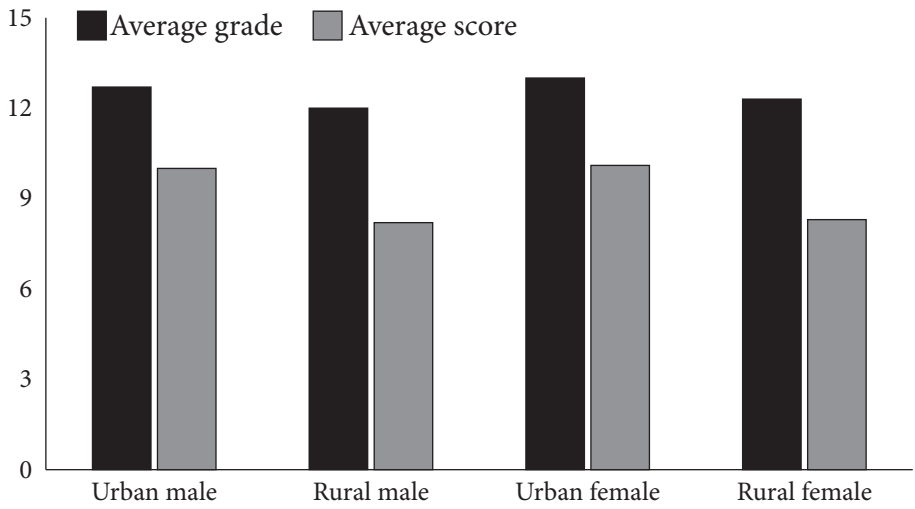
Table 8.2. Gender differences in primary school performance in Tunisia

Performance measure	Girls	Boys	Gender difference[a]
Grade average 1996	12.7	12.3	Girls outperform boys
Primary school-leaving examination 1996 (grade 6)			
Language score[b]	8.9	7.9	Girls outperform boys
Mathematics score	6.1	7.1	Boys outperform girls
Scientific awareness score	10.1	10.5	Girls and boys perform equally
TIMSS 2003 (Grade 4)			
Mathematics score	342	337	Girls and boys perform equally
Science score	316	312	Girls and boys perform equally

a. Difference between girls' scores and boys' scores significant at 5 percent level or better.
b. Average of scores on Arabic expression, study of Arabic texts, French expression, and study of French texts.

Source: Martin and others 2004; Mullis and others 2004; and authors' calculations using the 1995/96 Primary Leaving Examination Score Data Set.

Figure 8.1. Average school grades and primary-leaving examination scores, by gender and urban/rural residence, Tunisia 1996



Note: This figure shows the average of students' school grades and primary school-leaving examination scores, both measured on a 0–20 scale.
Source: Tunisia Ministry of Education, 1995/96.

Table 8.3. Gender differences in lower secondary school performance in Tunisia, 1999 and 2003

Performance measure	Girls	Boys	Gender difference[a]
TIMSS 1999 (Grade 8)			
Mathematics score	436	460	Boys outperform girls on three of five subtests
Science score	417	442	Boys outperform girls on two of six subtests
TIMSS 2003 (Grade 8)			
Mathematics score	399	423	Boys outperform girls
Science score	392	416	Boys outperform girls

a. Difference between girls' scores and boys' scores significant at 5 percent level or better.

Source: Martin and others 2000; Mullis and others 2000; Martin and others 2004; Mullis and others 2004.

are working in the home, compared with 4 percent of boys, despite compulsory school attendance laws. By age 15–16 nearly 40 percent of both girls and boys are working outside the home. Another 30 percent of boys are looking for work outside the home, while a similar share of girls are working at home. About a third of both boys and girls are attending private or technical schools.

Gender differences in performance also appear among those who are able to proceed to lower secondary school. On international tests of achievement in mathematics and science, eighth-grade boys outperformed eighth-grade girls in both 1999 and 2003, and more boys than girls completed the nine-year basic education cycle as recently as 2003 (Martin and others 2000; Mullis and others 2000; Martin and others 2004; Mullis and others 2004; IFC 2004) (table 8.3).

What accounts for the gender equity in school outcomes through grade 6 and the emergence of gender inequalities afterward? Are some girls more vulnerable during transition to lower secondary school than others? What are the implications of these findings for countries that, like Tunisia, have achieved universal enrollment at the basic education level?

Education in Tunisia

Tunisia is a medium-size country (population 10 million) on the southern coast of the Mediterranean. It was colonized by the Phoenicians (twelfth to sixth century BC) and became a major economic power as Carthage (sixth to second century BC). It was conquered by the Romans (second century BC to fifth century AD), converted to Islam by the Arabs (seventh to ninth century), ruled by the Berbers (ninth to tenth

and thirteenth to sixteenth centuries), incorporated into the Byzantine and Ottoman Empires (sixth to seventh and eighteenth and nineteenth centuries), and designated a French protectorate (late nineteenth century) before finally becoming an independent republic in 1956.

Although the Phoenicians invented the alphabet, Tunisia is not yet fully "alphabetized" (literate). Female literacy lags behind that of males, although the gap has narrowed considerably in recent years, particularly for youth (see table 8.1).

The road to literacy began with a major education reform in 1958 that was designed to ensure universal primary education. After 30 years it was clear that girls were lagging behind boys in education participation. In 1991 a second education reform made basic education compulsory for both boys and girls 6–16, with parental penalties for noncompliance. At the same time, sexual stereotypes were eliminated from school textbooks (Republic of Tunisia 1999). A monitoring and evaluation system was established in the 1994/95 school year to realize the national literacy strategy (UNESCO/IBE 2001).

The education system in the 1990s included five phases: an optional, fee-paying preschool for children 3–6; a free and compulsory six-year primary stage for children age 6 and above; a free three-year preparatory stage for those who qualified; a four-year secondary stage for those holding a basic schooling certificate; and postsecondary higher education. "Basic" education comprised the primary and preparatory stages (UNESCO/IBE 2001). A first step in achieving the goal of universal primary participation was reached in 1997/98, when 99 percent of six-year-olds were enrolled in school (IFC 2004).

Progression to the preparatory stage was not automatic in the 1990s. In order to enroll in the preparatory stage, students had to take a primary school-leaving examination at the end of grade 6. The score on this exam, combined with grades, determined which students advanced to a general junior secondary school, which could enroll in a technical school, and which had to exit the public school system. Both school grades and primary school-leaving examination scores were measured on a 0–20 scale, the correlation coefficient being 0.74. A score of 10 or more was required for a student to progress to a general public junior secondary school. About 60 percent of students did so in the second half of 1990s (up from about 30 percent in 1985). The examination-based selection after grade 6 was discontinued in 2000/01, when the preparatory stage became compulsory.

The data

This chapter uses three data sets. The 1997/98 Tunisia Grade 6 Students Survey collected detailed information on the characteristics of students enrolled in the final grade of primary school, their families, and the schools they attend. The survey was conducted

in two stages. In the first stage, carried out during the 1997/98 school year, 1,178 students were interviewed from 56 public primary schools, located in four gouvernorates (administrative regions): Ariana, Kasserine, Kebili, and Mahdia. In the second stage, carried out the following school year, the principals of the survey schools submitted information on the status of each student surveyed in the first stage, indicating whether the student had passed, failed, dropped out, or repeated.

The second data set is the 1995/96 Tunisia Dropouts Survey, which collected detailed information on the characteristics of some 100 public primary schools, including data on the experience and educational attainment of the teachers and principals. These schools were located in seven *gouvernorates*: Ariana, Bizerte, Jendouba, Sidi Bouzid, Gafsa, Medenine, and Mahdia.

To document the correlates of the primary school-leaving examination score and school grades, we used administrative records on the primary school-leaving examination score and school grade averages of all students enrolled in grade 6 in 1995/96. Of these 244,244 students, 99.4 percent took the primary school-leaving examination. Examination scores were separated by 10 subject areas (figures in parentheses represent the weights given to each subject area): mathematics (0.208), study of Arabic texts (0.166), study of French texts (0.166), Arabic expression (0.125), French expression (0.083), scientific awareness (0.083), Islamic education (0.042), history (0.042), civics (0.042), and geography (0.042). The overall primary school-leaving examination score is a weighted sum of these subject area scores. Identifiers of the student's gender; school grade average; and school, *gouvernorate,* and urban/rural location accompany this information.

The large sample size is the most attractive feature of the administrative records data set. Unfortunately, it includes no information on the characteristics of the school or the students' family. To partially remedy this situation, we turn to the information collected by the 1995/96 Tunisia Dropouts Survey. These two data sets are matched by school, and the resulting subsample of the 1995/96 Tunisia Ministry of Education data set is used for the analysis. The final data set included 6,384 observations, representing students enrolled in 95 schools.[2] Characteristics of samples used in the various analyses are presented in annex tables 8A.1 and 8A.2.

What accounts for gender equity at the early stages of basic education?

What explains the observed gender equity in schooling outcomes during the early stages of basic education in Tunisia? To be sure, some of the positive outcomes (such as universal enrollment rates) have to do with the enforcement of compulsory school attendance

2 The school code for one of the schools that appeared in the 1995/96 Tunisia Dropouts Survey did not have a counterpart in the Tunisian Ministry of Education data set. For four additional schools, some of the data required for the empirical analysis were missing.

laws at the basic education level. But parents also make supplementary contributions to their children's education; after taking into account (expected) returns to their children's schooling, they could end up investing disproportionately in boys' schooling.[3]

The data sets do not fully support this hypothesis, perhaps because the benefits to basic and secondary education are not adequately captured by labor market outcomes alone. Indeed, Tunisian girls enjoy relatively equal access to preschool, relatively equal access to private tutoring, comparable time-use patterns outside the school, and equal home inputs. In contrast, rural-urban differences in the provision of supplementary inputs, which we discuss in some detail below, are sizable. These findings are consistent with the standardized test results, which do not show a significant female disadvantage but do document poor learning outcomes for children residing in rural areas.

Preschool

Although little is known about the causal influence of preprimary school attendance on further schooling, there is some evidence suggesting that it is important for further educational attainment. Studies of the Perry Preschool experiment in the United States find that children who participated in the program exhibit higher intelligence, higher school enrollment, lower repetition and dropout rates, higher employment rates, higher income, and less involvement in crime than children who did not participate (Schweinhart and Weikart 1980; Berrueta-Clement and others 1984; Schweinhart, Barnes, and Weikart 1993). Studies using data from developing countries also find that preprimary school attendance is positively associated with increased school performance (see, for example, Myers 1995; World Bank 1995).

Preschool is not compulsory in Tunisia, but it is widely provided by public, private, and Koranic schools. Preschool (*jardins d'enfants*) covers children three to six and is the responsibility of the Ministry of Women, Family and Children. Koranic schools are the responsibility of the Ministry of Religious Affairs. Kindergarten, or the "preprimary preparatory year," covers children five to six and is the responsibility of the Ministry of Education.

The 1997/98 Tunisia Grade 6 Students Survey has a section on preprimary schooling. About 28.5 percent of children in the sample attended kindergartens and 30.3 percent attended Koranic schools. Among (first time) grade 6 students who had attended kindergartens, 70 percent received a passing score at the end of the year; only 50 percent of students who had not attended kindergarten passed. Attendance at Koranic schools is not associated with higher pass rates: about 55 percent of all first time

3 Kaboski (2004) estimates the returns to one additional year of schooling in Tunisia at about 8 percent, which compares favorably with the only other North African country included in the same study, Egypt, where returns to schooling are 5.2 percent. We are not aware of research that estimates returns to schooling separately for females in Tunisia. There is a sizable gap between the labor force participation rates of males (at 82 percent in 2000) and females (at 40 percent in 2000). Still, when it comes to female labor force participation rates, Tunisia performed better then other North African countries, with the exception of Morocco, where the female labor force participation rate was 43 percent in 2000 (World Bank 2005).

grade 6 students passed at the end of the school year, with no difference between those that attended Koranic schools and those that did not.

Grade 6 boys and girls were equally likely to have attended kindergarten and Koranic schools. In the bivariate probit regressions, the dependent variable takes the value 1 if the student participated in kindergarten or a Koranic school (table 8.4). The explanatory variables are gender, maternal schooling, paternal schooling, possessions in the household, and residence. Although the signs of the coefficients for the male dummy variable suggest that boys are more likely to attend Koranic preschools and girls more likely to attend kindergartens, the effects are not statistically significant.

Statistically significant predictors of kindergarten attendance include higher parental educational attainment, family household wealth, and urban residence.[4] For Koranic schools the only statistically significant predictor was residence: children from rural households were less likely than urban children to attend a Koranic preschool, while children from suburban households were more likely than urban children to do so.

Both maternal and paternal education levels are significant predictors of kindergarten attendance but not of Koranic school attendance.[5] Children from better-off households are also more likely to attend kindergarten. Children from rural households are less likely to attend any form of preschool.[6]

The negative correlation of the error terms of the equations indicates that, controlling for the explanatory variables, as the probability of kindergarten enrollment increases, the probability of enrollment in Koranic school decreases and vice versa. When the same model is estimated for boys and girls separately, the overall trends remain the same. A key difference is that while the parental schooling coefficients are statistically significant at the 5 percent level or better for girls, for boys the only parental schooling dummy that is statistically significant at the 5 percent level is having a mother who completed at least primary school (results available from the authors upon request). Similarly, the wealth effect on kindergarten attendance is almost twice as great for girls as it is for boys (statistically significant at the 1 percent level).

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4 Two issues regarding the estimation deserve consideration. First, because the Tunisian survey collected data on grade 6 students, the analysis of kindergarten and Koranic school attendance is subject to selection bias, in that data on students who dropped out before reaching grade 6 are not included. This possibility is ignored here. The effect is likely to be negligible, since the dropout rates in early grades of primary school are low (about 4 percent of students drop out before reaching the final grade of primary school). Second, the analysis of kindergarten and Koranic school attendance is subject to omitted variable bias, because there are no data on the availability and characteristics of preprimary schools. The residence dummies may roughly control for availability. The lack of data on the characteristics of preprimary schools is more problematic. This issue is partially taken into account by distinguishing between kindergartens and Koranic schools.

5 A chi-squared test with eight degrees of freedom strongly rejects the hypothesis that the coefficients for the kindergarten and Koranic school attendance equations are the same (t-statistic is 69.3).

6 Since dropout and repetition rates are high at the end of grade 6, in an attempt to avoid a likely selection bias, the empirical analyses reported here use a subsample of the students, those who were first time grade 6 students at the time of the 1997/98 Tunisia Grade 6 Students Survey.

Table 8.4. Bivariate probit estimates of preprimary school attendance at kindergarten and Koranic schools in Tunisia, 1998

Independent variable	Kindergarten	Koranic school
Gender		
Male	–0.16 (–1.3)	0.08 (0.73)
Mother's schooling		
Primary school attendance (vs. no schooling)	0.04 (0.26)	–0.21 (–1.58)
Primary school complete or more (vs. no schooling)	0.59*** (3.21)	–0.09 (–0.48)
Father's schooling		
Primary school attendance (vs. no schooling)	0.34* (1.87)	–0.11 (–0.75)
Primary school complete or more (vs. no schooling)	0.76*** (3.89)	–0.23 (–1.36)
Household possessions index	0.28*** (6.1)	0.04 (1.02)
Residence		
Rural (vs. urban)	–0.44*** (–2.59)	–0.34** (–2.06)
Suburban (vs. urban)	–0.24 (–1.4)	0.33** (1.98)
Constant	–2.50*** (–7.04)	–0.51* (–1.71)
ρ	–0.45	0.32
Number of observations	599	590
Log-likelihood	605.76	580.76

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics.

Source: Tunisia Grade 6 Student Survey, 1997/98.

Private and supplemental lessons

In many countries families hire tutors for their children to enhance their likelihood of advancing in school (Bray 2003; Wolf 2002). In some cases boys benefit more from these family expenditures, although a review of the literature by Bray (1999) reveals varied

findings, with no sign of female disadvantage in private tutoring in Egypt, Malaysia, Malta, Sri Lanka, and Taiwan (China) (conditional on school enrollment). The 1997/98 Tunisia Grade 6 Student Survey collected information on two types of additional tutoring: private courses offered by individual teachers and "supplemental" courses offered by schools. The main difference between these courses was their cost: private courses in Tunisia cost about three times as much as supplemental courses. About one-third of the students who took private courses took them from their own teacher at school. Almost all the remaining students took private courses from teachers other than their own. A similar trend exists for supplemental courses: 93 percent of students who took supplemental courses did so from their own teacher at school. Both private and supplemental courses focused on calculus, Arabic, French, and science. Supplemental courses are not free: about 85 percent of students who took such courses reported paying for them.

Boys appear more likely to take private courses than girls, but there is no gender difference in access to supplemental courses. Furthermore, the gender coefficient in the private-courses model is small and not statistically significant at the 10 percent level (table 8.5). The dependent variable takes the value 1 if the student receives private or supplemental lessons. In these models the explanatory variables are the same family background variables discussed above plus two school quality variables: teacher qualifications and class size.

Children from wealthier households are significantly more likely to take private or supplemental lessons, while children from rural households are significantly less likely to do so. Children from suburban households are more likely to have private (but not supplemental) lessons. Neither gender nor parental education is a statistically significant predictor of taking private or supplemental lessons. When the same model is estimated for boys and girls separately, the overall trends remain the same, but the wealth effect in the private-course regression is statistically significant only for girls, although for both genders the sign of the estimated parameter is as expected (results available from the authors upon request). We interpret this to mean that wealthier families are willing to pay for girls' tutoring but less wealthy families are not, whereas wealth has little impact on a family's willingness to pay for boys' tutoring.

We hypothesized that children in better-quality schools would be less likely to need, and therefore take, private or supplemental lessons. The regressions do not fully support this hypothesis. While the signs of coefficients for teacher qualifications were in the expected direction, with students in schools with more qualified teachers less likely to take private or supplemental lessons, the effects were not statistically significant. Contrary to our hypothesis, students in larger classes were less likely to take private or supplemental lessons, and these effects were statistically significant. One possibility is that larger classes represent greater demand for education, associated with better schools, rather than lower-quality education. This explanation is not supported by data, however: Mete (2004) shows that larger class sizes are negatively associated with the probability of receiving a passing score at the end of grade 6. It is

Table 8.5. Bivariate probit regressions on use of private and supplemental courses during primary school in Tunisia, 1998

Independent variable	Private tutoring	Supplemental courses
Gender		
Male	0.18 (1.37)	0.01 (0.09)
Mother's schooling		
Primary school attendance (vs. no schooling)	0.01 (0.07)	–0.03 (–0.23)
Primary school complete or more (vs. no schooling)	0.16 (0.76)	0.27 (1.51)
Father's schooling		
Primary school attendance (vs. no schooling)	0.22 (1.12)	0.02 (0.16)
Primary school complete or more (vs. no schooling)	0.08 (0.38)	0.00 (0.00)
Household possessions index	0.15*** (2.74)	0.18*** (4.64)
Residence		
Rural (vs. urban)	–0.69*** (–3.56)	–0.44*** (–2.57)
Suburban (vs. urban)	0.42* (1.95)	–0.12 (–0.63)
Percentage of teachers holding a post-bachelor diploma	–0.30 (–0.74)	–0.47 (–1.37)
Average number of primary students per class		
33–36 (vs. 24–32)	–0.25 (–1.50)	–0.33** (–2.52)
37–43 (vs. 24–32)	–0.72*** (–3.53)	–0.45*** (–2.86)
Constant	–1.71*** (–4.46)	–0.22 (–0.74)
ρ	–0.45	0.32
Number of observations	599	590
Log-likelihood	–605.76	–580.76

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics.

Source: Tunisia Grade 6 Student Survey, 1997/98.

also possible that as the number of students per teacher increases, teachers' time available for private courses becomes a constraint. This explanation is a poor one, however, because in such cases students should be able to switch to private instructors who are not teachers (such as high school students who have previously taken the primary school-leaving examination).

Time use out of school

In many countries girls have less time for homework due to high demands for their household labor, including housework, fetching wood and water, and caring for younger siblings (Ilahi 2001; Groothaert and Kanbur 1995). This does not seem to be the case in Tunisia for grade 6 girls. We examined the determinants of five types of out-of-school time use by boys and girls (table 8.6).[7] The first three columns in table 8.6 present ordinary least squares, probit, and tobit regression estimates for academic time use: time allocated to school homework, whether the child reads books other than school textbooks, and the amount of help received from parents. These are uses of time that support academics and can be considered inputs into schooling. Boys are less likely than girls to read books other than textbooks, but they spend no more time doing homework and are no more likely to receive help from parents than girls, everything else equal. That is, girls do not appear to be disadvantaged with respect to academic time use.

Girls do not appear disadvantaged with respect to work time either. The last two columns in table 8.6 present tobit regression estimates for housework and work outside the home. Girls spend more time working at home than do boys, while boys spend more time working outside the home. The "number of hours spent helping with housework in a week in grade 6" variable is obtained by summing four categories of housework time: time spent helping with housework, time spent caring for siblings, time spent fetching water and wood, and time spent on other household tasks. Girls are much more likely than boys to help with housework. Children of mothers who completed primary education spend less time doing housework, while children of fathers with only primary schooling spend more time doing housework. The household possessions index coefficient has a negative sign and is significant at the 1 percent level. Children enrolled in schools with crowded classes are likely to spend more time helping with housework.

7 The time allocation questions in the 1997/98 Tunisia Grade 6 Students Survey inquired about time allocated to a number of activities (such as homework and taking care of siblings) in a typical week. Measurement error is a concern in this context (see Juster and Stafford 1991); these models should therefore not be interpreted as definitive evidence on time use patterns of children. More detailed surveys with diary style time-use modules (such as that used in the Multinational Time Use Study (Centre for Time Use Research 2006) would improve the understanding of time-use patterns significantly. In the absence of such survey data, it is useful to recognize that if standard assumptions hold for the measurement error and the error term of the regression, the measurement error can be ignored in models that use time-allocation data as dependent variables (see Stapleton and Young 1984).

Table 8.6. Regression estimates of out-of-school time use by grade 6 students in Tunisia, 1998

Independent variable	Hours spent doing homework (ordinary least squares)	Reads books other than textbooks (probit)	Hours of parental help received (tobit)	Hours spent on housework (tobit)	Hours spent working outside the home (tobit)
Gender					
Male	–0.42 (–1.03)	–0.30*** (–2.71)	0.01 (0.02)	–5.79*** (–8.82)	11.25*** (3.78)
Mother's schooling					
Primary school attendance (vs. no schooling)	0.33 (0.67)	0.24* (1.79)	1.25 (1.61)	–0.53 (–0.68)	1.34 (0.40)
Primary school complete or more (vs. no schooling)	–0.15 (–0.23)	0.46** (2.44)	1.30 (1.30)	–3.43*** (–3.17)	2.79 (0.59)
Father's schooling					
Primary school attendance (vs. no schooling)	0.36 (0.68)	–0.13 (–.88)	0.64 (0.73)	1.90** (2.23)	4.76 (1.32)
Primary school complete or more (vs. no schooling)	0.63 (1.04)	–0.35** (–2.17)	2.13** (2.21)	1.17 (1.20)	–3.81 (–0.86)
Household possessions index	0.39*** (2.76)	0.16*** (4.15)	0.41* (1.85)	–0.78*** (–3.51)	–1.22 (–1.36)
Residence					
Rural (vs. urban)	0.03 (0.05)	–0.36** (–2.08)	–2.07** (–2.15)	1.68 (1.64)	8.78 (1.53)
Suburban (vs. urban)	1.00 (1.36)	0.05 (0.22)	–0.11 (–0.1)	0.31 (0.26)	–0.48 (–0.08)
Percentage of teachers holding a post-bachelor diploma	1.13 (0.87)	–0.04 (–0.11)	–0.38 (–0.19)	0.07 (0.03)	–33.66*** (–2.98)
Average number of students per primary class					
33–36 (vs. 24–32)	–0.06 (–0.13)	–0.18 (–1.32)	–1.94** (–2.50)	0.96 (1.23)	4.91 (1.41)
37–43 (vs. 24–32)	–1.68*** (–2.77)	–0.06 (–0.35)	–1.41 (–1.45)	1.67* (1.76)	7.75** (1.98)
Constant	8.45*** (7.57)	0.00 (–0.01)	–3.21* (–1.81)	9.20*** (5.20)	–22.82*** (–2.64)

(continued)

Independent variable	Hours spent doing homework (ordinary least squares)	Reads books other than textbooks (probit)	Hours of parental help received (tobit)	Hours spent on housework (tobit)	Hours spent working outside the home (tobit)
R^2	0.06	—	—	—	—
Number of observations	570	597	579	604	604
Log-likelihood		–346.04	–978.80	–1,627.76	–547.75

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are *t*-statistics; — indicates variable not included in model.

Source: Tunisia Grade 6 Student Survey, 1997/98.

Most children in Tunisia do not report working outside the home. The dependent variable is obtained by adding the number of hours a child spent helping his or her family's work or business, doing seasonal work, and doing other work. The estimation results should be viewed as illustrative, since about 85 percent of the observations are censored at zero hours of work. Some trends are clear, however: girls are less likely than boys to work outside the home, and parental educational attainment does not affect working outside the home. Children attending schools with better educated teachers and smaller class sizes—possibly associated with better schools or schools in wealthier communities—are also less likely to work outside the home.

A trend that indirectly reinforces gender inequalities starts to emerge at the end of grade 6: girls work at home more than boys, and children of less educated parents (those who did not complete primary school) work at home more. Conversely, children from households with more possessions are working at home less, as are children attending schools with higher teacher qualifications and smaller classes. Since girls work at home more than boys do, these factors are more likely to affect girls.

Rural-urban differences

In many countries school participation and achievement vary in an orderly manner, with highest participation and achievement by urban males, followed by urban females, rural males, and rural females. This pattern is not observed in Tunisia at the primary level. Nevertheless, rural students are systematically disadvantaged in four ways. Rural students are less likely to attend preschool, receive private or supplemental lessons, read books other than textbooks, or receive academic help from their parents. In addition, some children in very remote rural areas may speak a Berber language as a mother tongue and may encounter difficulties with the language of instruction. (Our data do not include information on the language spoken at home.) While the rural disadvantage is visible for both boys and girls (we experimented with models

that include an interaction term between gender and rural residence, but this exercise did not reveal a robust trend), the cost of "failure" is much more severe for girls who live in rural areas, as shown below. Thus lack of a supportive household environment in rural areas is particularly detrimental for girls' schooling.

When and how do gender inequalities start to emerge?

Although girls and boys in Tunisia are as likely to attend preschool or to receive private or supplemental lessons and spend about the same amount of time working, girls have lower achievement at the lower secondary stage of schooling and fewer opportunities if they fail to advance to lower secondary school. Rural children are more disadvantaged with respect to family inputs to education. This section examines the determinants of education achievement at the end of sixth grade and the consequences of failure for girls, particularly rural girls.

Predictors of school grades and primary school-leaving examination scores

Primary school-leaving examination scores tend to be lower than grades in school, with only minor gender differences (see figure 8.1). Students residing in rural areas have lower school grades and much lower primary school-leaving examination scores than other students. What school and community factors account for these differences?

In this analysis the average primary school-leaving examination score of students and the average grade average of students in a school are considered to be functions of school and community characteristics. Characteristics of the students' families that are not captured by the grades and examination-scores data set would also influence these dependent variables. Moreover, teacher and school characteristics that are considered explanatory variables may themselves be influenced by parental characteristics (for example, influential parents may determine to some extent the amount of resources that schools enjoy). Thus the results of the Seemingly Unrelated Regression (SUR) estimation (table 8.7) should be interpreted with caution, as these correlations need to be explored in more detail by future research.

For both boys and girls, four school characteristics are related to their primary school-leaving examination scores: the principal's experience in the school, the teachers' experience in the school, the percentage of female teachers in the school, and the average number of grade 6 students per teacher. For girls the percentage of teachers with a higher education diploma is also important, while for boys the teachers' experience overall matters. The signs of the coefficients are the same for both boys and girls, indicating that school quality is important for both boys and girls. Teacher quality, however, has a stronger effect on girls' achievement than on boys', as indicated by the size of the coefficient. Certain subject area scores (mathematics and scientific

Table 8.7. Seemingly Unrelated Regression (SUR) estimates of predictors of primary school-leaving examination score and grade average and variable means

	Means		Boys		Girls	
Independent variable	**Boys**	**Girls**	**Primary school-leaving score**	**Grade average**	**Primary school-leaving score**	**Grade average**
School characteristics						
Principal's experience (in this school)	5.30 (6.03)	5.30 (5.92)	0.03*** (3.08)	0.00 (0.16)	0.02** (2.39)	0.00 (0.39)
Principal's experience (overall)	26.50 (8.40)	27.30 (7.74)	0.01 (0.76)	0.01 (1.19)	–0.01 (1.41)	0.00 (0.05)
Teachers' experience (average, in this school)	5.29 (2.59)	5.51 (2.60)	0.07** (2.32)	0.03 (1.17)	0.14*** (4.35)	0.07*** (2.74)
Teachers' experience (average, overall)	12.10 (5.50)	12.80 (5.34)	0.08*** (2.87)	0.03 (1.08)	0.02 (0.69)	–0.01 (0.41)
Percentage of female teachers	0.45 (0.23)	0.48 (0.21)	0.77*** (3.10)	–0.13 (0.59)	1.51*** (5.32)	0.72*** (3.04)
Percentage of teachers with high education diploma	0.38 (0.27)	0.41 (0.27)	0.55 (1.17)	–0.48 (1.13)	1.37*** (2.68)	0–.05 (0.11)
Number of grade 6 students/number of teachers in the school	5.00 (1.35)	5.03 (1.18)	–0.17*** (4.36)	–0.13*** (3.99)	–0.21*** (4.33)	–0.24*** (5.98)
Town characteristics						
Agricultural sector only (no service or industry sector)	0.65 (0.48)	0.61 (0.49)	–0.22* (1.84)	–0.31*** (2.90)	–0.19 (1.46)	–0.31*** (2.87)
Urban	0.53 (0.49)	0.59 (0.49)	0.05 (0.32)	0.14 (0.96)	0.01 (0.06)	0.26* (1.85)
Constant			8.01*** (22.60)	12.00*** (38.20)	8.33*** (19.20)	12.40*** (34.20)
R^2			0.12	0.03	0.11	0.06
Correlation of residuals			0.77		0.77	
Number of observations	3,353	3,031	3,353	3,353	3,031	3,031

* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Note: Figures in parentheses are standard deviations in columns 1–2 and *t*-statistics in columns 3–6. Coefficients for *gouvernorate* dummies are not shown.

Source: Tunisia Dropouts Survey, 1995/96; Tunisia Ministry of Education, 1995/96.

awareness) are much more sensitive to school characteristics than others (Islamic education, history, and geography) (results available from the authors upon request).

School characteristics have little effect on boys' grade averages. Only one school characteristic—the number of grade 6 students per teacher—is significantly related to the grade average of boys. In contrast, three school characteristics are related to girls' grades: teachers' experience in the school, the percentage of female teachers in the school, and class size, although the overall explanatory power of the regression is low.[8] A key trend to highlight here is that girls benefit much more than boys from more experienced teachers (in the same school), from a higher percentage of female teachers, and from lower student/teacher ratios.

Community characteristics are also related to achievement. For both boys and girls, residence in a town having only an agricultural sector is associated with lower primary school-leaving scores and lower grades. For girls residence in an urban town is associated with higher grades.

Implications of failure at the end of grade 6 for girls in rural areas

What happens to children whose primary school-leaving scores and grades mean that they do not transition immediately to lower secondary school? To find out, Mete (2004) uses a multinomial logit model that considers the following mutually exclusive states: enrolled in private junior secondary school, enrolled in technical junior secondary school, working, looking for work, and helping with housework. We illustrate the female disadvantage after dropping out of the general education path by reporting simulated probabilities based on her specification.

The most common pushed-out student is a 14-year-old whose mother did not attend school, whose father is a daily worker, who lives in an urban setting, and has two older and two younger siblings. The postprimary activities of girls and boys with this profile differ significantly (table 8.8). The probability of a boy being in a private or technical school (39.2) percent is nearly twice that of a girl (21.6 percent). The probability of a girl helping with housework (46.1 percent) is more than 10 times that of a boy (3.9 percent). The probability of a boy working or looking for work (56.9 percent) is nearly twice that of a girl (32.4 percent). These probabilities change with different family configurations and residence.

Against this baseline, table 8.8 presents the effects of changing one characteristic on the probability of observing each outcome. This exercise enables evaluation of absolute changes in probabilities in response to changes in explanatory variables. It is also useful for making comparisons between the models for boys and girls.

Age affects boys and girls differently. Older boys (15–16) have lower probabilities of attending private or technical schools, while older girls have higher probabilities of doing so, although the differences are not great. If a boy has no older siblings (as

8 The R^2 statistics are 0.03 for boys and 0.06 for girls (compared with 0.12 and 0.11 for the primary school-leaving examination score regressions).

Table 8.8. What happens six months after dropping out? Estimated probabilities of attending school or working in Tunisia by gender, 1996 (percent)

Child characteristics	Private school		Technical school		Work		Looking for work		Housework	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Baseline[a]	13.4	2.7	25.8	18.9	31.6	20.4	25.3	12.0	3.9	46.1
Age										
15	10.4	5.8	22.1	21.3	37.3	33.8	27.5	9.3	2.7	29.8
16	7.8	10.4	18.4	20.1	42.9	47.2	29.1	6.1	1.9	16.2
Number of older siblings										
0	10.4	2.8	38.9	19.5	31.3	23.4	17.4	10.0	1.9	44.4
4	15.6	2.5	15.4	18.1	28.9	17.6	33.1	14.3	7.0	47.4
Number of younger siblings										
0	11.0	5.3	39.3	19.2	26.8	16.8	20.8	10.4	2.2	48.4
4	15.1	1.3	15.6	18.1	34.6	24.2	28.5	13.5	6.3	42.9
Father's profession										
Unemployed	7.5	4.9	30.9	23.2	29.7	9.4	31.1	25.8	0.8	36.8
Independent	24.1	10.1	17.8	16.6	34.4	6.8	22.3	16.7	1.5	49.8
Employee (salary earner)	20.0	4.6	32.3	27.9	23.0	8.6	21.2	13.3	3.6	45.5
Mother's education										
Primary school attendance	13.1	1.7	39.6	26.8	24.6	26.9	20.5	19.6	2.2	25
Primary school completion or more	19.9	3.2	15.5	33.8	18.5	21.5	46.1	15.0	0	26.6
Residence										
Rural	9.7	1.6	12.2	4.4	16.1	3.5	55.5	16.7	6.6	73.9

a. Baseline individual is 14 years old, lives in an urban area, and has a mother who did not attend school, a father who is a daily worker, and two older and two younger siblings.

Source: Based on multinomial logit coefficients estimated separately for boys and girls reported by Mete 2004.

opposed to having two older siblings), the probability of technical junior secondary school attendance increases from 25.8 percent to 38.9 percent (the probability of attending private junior secondary school decreases slightly). The number of younger siblings has an influence of similar magnitude for boys. For girls, too, as the number of siblings increases, the probability of attending a technical junior secondary school decreases, although the magnitude of the effect is modest. If the father has an independent occupation, the probability of attending a junior secondary school increases, from 39.2 percent (in the base scenario) to 41.9 percent for boys and from 21.6 percent to 26.7 percent for girls. If the father is a salary earner, the corresponding probabilities are 52.3 percent for boys and 32.5 percent for girls. Mother's education has a strong positive influence on the probability of technical junior secondary school attendance for girls (26.8 percent if the mother attended primary school and 33.8 percent if the mother completed primary school or more compared with 18.9 percent in the base scenario). If the mother has some education, the probability of helping with housework declines from 46.1 percent in the base scenario to about 25.0 percent.

Perhaps most important are the strong urban/rural effects, particularly for girls. For girls residing in rural areas, the estimated probability of helping with housework is 73.9 percent, compared with 46.1 percent in the base case, while the probability of attending either private or technical school drops from 21.6 percent in the base case to 6.0 percent. Rural residence matters for boys as well. The probability of "looking for work" increases from 25.3 in the base scenario to 55.5 if the residence changes from urban to rural, while the probability of attending either private or technical junior secondary school declines from 39.2 percent to 21.9 percent. But rural boys are still nearly four times as likely as rural girls to attend some form of postprimary school.

Conclusions

Gender inequalities in educational outcomes in Tunisia do not emerge because girls experience a less supportive household environment or school environment. Girls perform as well as boys in the primary school-leaving examinations, so testing itself also does not directly put girls at a disadvantage. The selection aspect of testing places girls at a disadvantage indirectly, however, because parents are much less likely to enroll girls who fail to receive an overall passing score (and thus are ineligible to remain on the general public secondary education path) in private or technical schools. Girls' disadvantage in enrollment is much greater for poor, rural girls with uneducated mothers.

What policy interventions are appropriate in educational settings similar to Tunisia's at the end of 1990s? One set of interventions could target girls who do not receive a passing score (especially those from low socioeconomic background families in rural areas) for special treatment.

An alternative policy would be to try to help girls while they are still in primary school, recognizing that the cost of failure for them is more severe. In a large majority of the empirical models that we considered, school-related outcomes by girls (kindergarten attendance, taking private courses, primary school-leaving-examination scores) are much more sensitive to the household and school/teacher characteristics than they are for boys. While it may be difficult or impossible to improve the household environment girls face (especially in rural areas), it may be possible to improve the school and teacher characteristics that are strongly correlated with girls' school performance. Such a positive discrimination policy may be justified economically, since there is a strong case for advocating public policy interventions that explicitly focus on improving girls' schooling outcomes. Schultz (2001) argues for a disproportionate amount of expenditure on women's education on the grounds that the health and schooling of children are more closely related to their mother's education than their father's and because more educated women work more hours in the market labor force, broadening the tax base.

A third alternative would be to abolish examination-based selection in the early stages of education, as Tunisia did in 2000/01. Such selection may be inefficient and have significant inequality implications, including but not limited to gender inequalities.

Annex to Chapter 8

Table 8A.1. Characteristics of samples used for analyses of preprimary school attendance and private/supplemental courses during primary school

	Preprimary school attendance		Private/supplemental courses	
Characteristic	**Frequency**	**Percent**	**Frequency**	**Percent**
Gender				
Male	305	51	304	52
Female	294	49	286	48
Mother's schooling				
No schooling	323	54	316	53
Primary school attendance	180	30	178	30
Primary school complete or more	96	16	96	16
Father's schooling				
No schooling	141	23	138	23
Primary school attendance	264	44	259	44
Primary school complete or more	194	32	193	33
Household possessions index				
0–1	16	3	15	3
2–3	56	9	54	9
4–5	124	21	119	20
6–7	366	61	367	62
8–11	37	6	35	6
Residence				
Urban	116	19	115	19
Rural	311	52	304	51
Suburban	172	29	171	29
Percentage of teachers holding a postbachelor diploma (mean)	—	—	36	—
Average number of students per class (primary cycle)				
24–32	—	—	242	41
33–36	—	—	199	34
37–43	—	—	149	25
Total	599	100	590	100

Note: — indicates data not available.

Source: Tunisia Grade 6 Student Survey, 1997/98.

Table 8A.2. Characteristics of samples used for homework, reading books other than textbooks, help from parents, housework, and work models

Characteristic	Home-work	Other books	Help received	House-work	Work
Gender					
Male	50.88	51.09	51.30	51.32	51.16
Female	49.12	48.91	48.70	48.68	48.84
Mother's schooling					
No schooling	53.68	53.77	53.71	53.64	53.64
Primary school attendance	30.00	29.98	30.05	30.13	30.13
Primary school complete or more	16.32	16.25	16.23	16.23	16.23
Father's schooling					
No schooling	23.51	23.79	23.32	23.51	23.34
Primary school attendance	43.86	43.72	44.39	43.87	44.04
Primary school complete or more	32.63	32.50	32.30	32.62	32.62
Household possessions index					
0–1	2.46	2.68	2.59	2.65	2.65
2–3	9.12	9.05	8.98	9.27	9.11
4–5	20.70	20.27	21.07	20.36	20.53
6–7	61.93	61.81	61.31	61.59	61.59
8–11	5.79	6.20	6.04	6.13	6.13
Residence					
Urban	19.65	19.77	18.83	19.54	19.54
Rural	50.70	51.59	52.33	51.66	51.66
Suburban	29.65	28.81	28.84	28.81	28.81
Percentage of teachers holding a postbachelor diploma (mean)	36.31	35.97	36.12	35.94	35.95
Average number of students per class (primary cycle)					
24–32	41.40	40.87	41.45	41.39	41.39
33–36	34.21	33.67	33.51	33.61	33.44
37–43	24.39	25.46	25.04	25.00	25.17
Number of observations	570	597	579	604	604

Source: Tunisia Grade 6 Student Survey, 1997/98.

Table 8A.3. Primary school-leaving examination (PSLE) scores and grades in school, 1995/96

Performance measure	Mean for complete sample			Mean for students from schools included in the 1995/96 Tunisia Dropouts Survey		
	Male	Female	Total	Male	Female	Total
Grade average	12.3	12.7	12.5	12.1	12.4	12.2
Overall PSLE score	9.3	9.5	9.4	8.9	9.0	9.0
Subject area scores						
Arabic expression	8.8	9.8	9.3	8.8	9.6	9.1
Study of Arabic texts	9.1	9.9	9.5	8.6	9.2	8.8
French expression	6.2	7.1	6.6	6.1	6.7	6.4
Study of French texts	7.8	8.7	8.2	7.2	8.0	7.6
Islamic education	18.0	18.3	18.1	17.9	18.3	18.1
History	15.0	14.7	14.9	14.8	14.5	14.7
Scientific awareness	10.5	10.1	10.3	10.1	9.9	10.0
Mathematics	7.1	6.1	6.6	6.6	5.4	6.0
Civics	13.3	13.2	13.2	13.1	13.1	13.1
Geography	14.7	13.7	14.2	14.3	13.5	14.0
Sample size	127,625	116,619	244,244	3,353	3,031	6,384

Source: Tunisia Dropouts Survey, 1995/96; Tunisia Ministry of Education, 1995/96.

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