

Concealed Preferences: Parental Attitudes to Education and Enrolment Choice in Rural Ethiopia

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Abstract Parental attitudes regarding the value of education may determine whether some, none or all school-aged children in a household are enrolled and how much formal education they will eventually complete. To the extent that attitudes are important and can be adequately measured, they should explain household demand for schooling in the absence of constraints. However, the attitudes which people express may be inconsistent with their behaviour when faced with schooling choices for their own children. If attitudes do not explain actual enrolment, the causes of this discrepancy must be addressed. This paper attempts to measure attitudes, explain their formation and investigate the role of attitudes in the allocation of human capital. Parental attitudes toward schooling are found generally to be favourable, and differences in attitudes help explain household enrolment decisions. However, attitudes alone cannot account for low enrolment in rural Ethiopia. High direct and opportunity costs of schooling also limit school participation in the face of credit constraints.

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1. Introduction

In the developed world, attitudes toward almost every conceivable product, politician and point of view have been studied intensively, mainly in the course of market research. Much less is known about the attitudes of people in the developing world towards the institutions and policies that often are imposed upon them. Yet the success or failure of many government and donor initiatives rests partly upon the recipients' views and perceptions.

Behaviour is a good indicator of attitudes in the absence of constraints, but an unconstrained decision environment normally cannot be assumed in the developing world. Parental attitudes may reveal a latent desire for schooling; a divergence between 'notional' and 'effective' demand. If so, evidence on the other determinants of enrolment will guide policy-makers in removing obstacles to participation in formal schooling. If not, and low enrolment is matched by poor attitudes toward education, evidence on the factors influencing the formation of attitudes will be relevant to educational policy-makers in low-enrolment areas.

Anecdotal evidence suggests that traditionally Ethiopians have highly valued formal education. Yet few rural children are enrolled in school and fewer still can be expected to complete primary education. This presents a research puzzle and makes rural Ethiopia an excellent setting to examine the relationship between attitudes and enrolment behaviour.

The paper is organised as follows. A model of attitude formation and the determinants of school enrolment is presented in Section 2. Section 3 describes the data used. To facilitate an understanding of how attitudes are shaped, attitude indexes are created and the formation of attitudes is examined in terms of various child, parent and household characteristics in Section 4. Section 5 analyses the determinants of school participation for the current cohort of school-aged children and considers in particular the role of parental attitudes in the enrolment decision. Section 6 concludes.

2. Modelling the Formation of Attitudes and the Determinants of Enrolment

Attitudes in Consumer Theory and Practice

Information on preferences is of general interest in consumer theory and will help to explain observed choices of bundles of goods and services by rational consumers in practice. Figures 1a-1c are drawn under the assumptions that the household maximises utility by choosing a bundle of education and other consumption such that the marginal rate of substitution between education and other consumption equals the ratio of the relative prices of education and other consumption. No borrowing is possible in this model, but supply is unconstrained.

Different levels of investment in education may reflect different budget constraints or different user fees (price of education) for individuals with the same indifference map (see Figures 1a and 1b) or they may reflect different preferences for schooling for individuals facing the same budget constraints and prices but having different indifference curves (see Figure 1c). Information on preferences will help to determine whether variations in observed levels of education (E_1 versus E_2) chosen by households are the result of differences in indifference maps or differences in incomes or prices faced by the decision-maker(s).

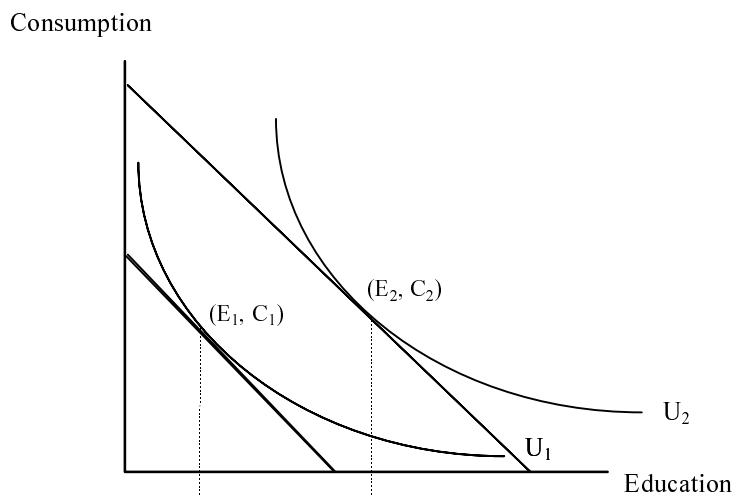


Figure1a - Same Indifference Map, Different Budgets

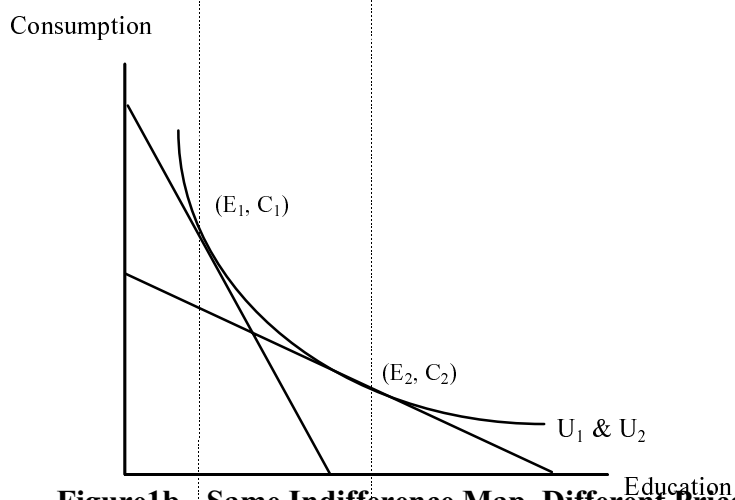


Figure1b - Same Indifference Map, Different Prices

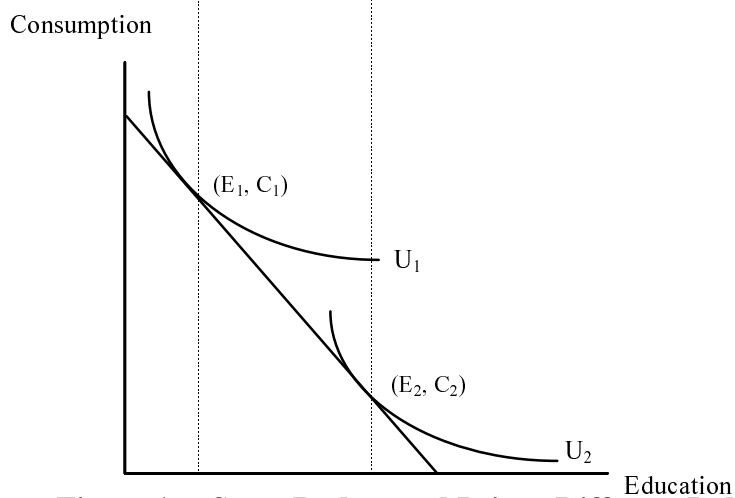


Figure 1c - Same Budget and Prices, Different Indifference Maps

Attitude Formation

Parental attitudes toward schooling are undoubtedly influenced by a multitude of factors, only a few of which can be examined in an economic framework. Attitudes to schooling may be exogenously related to perceptions of the effects of education on character development, status in the community, the continuity of traditional roles, and other social factors. Opinions may also be determined by endogenous, economic factors, including the ability of the child to make a living and raise a healthy, nutritiously-fed family in the future.

Social and economic considerations are not always in harmony. Parents may see economic benefits of educating their children but be wary of the potentially negative cultural impact of formal schooling. Alternatively, parents may believe that schooling enhances a child's (or household's) status in the community, but fear that children who go to school will not learn to be better farmers. However, endogenous and exogenous factors influencing attitudes may operate in tandem, perhaps even reinforcing one another. If parents believe that educated children have better life chances than other children, they may be less influenced by culturally-based objections to schooling. On the other hand, parents who see education as having a neutral or harmful effect on productivity may be more likely to hold negative views on the cultural effects of schooling.

There are also gender-specific aspects of both the endogenous and exogenous determinants of attitudes. Parents may believe that there are economic benefits of educating their sons, since they are likely to support them in retirement, but not favour educating girls, who may be expected to marry and confer the benefits of schooling on their husband's family. For some parents, while education may be thought to enhance the character of a boy, the same traits in a girl are seen as a threat to the maintenance of social roles.

These points hint at the proposition that attitudes are not necessarily unrelated to circumstances. Expressed attitudes may be conditioned by actual constraints upon schooling faced by the household. High costs of schooling or distances to the nearest school may prevent parents from considering the benefits of schooling or may even engender negative attitudes toward schooling (e.g., as a response to frustration with the lack of availability of affordable education).

Parental attitudes regarding the schooling of boys and girls in rural Ethiopia, as captured by a series of attitudinal questions designed to reveal opinions on social (exogenous) as well as economic (endogenous) aspects of schooling, will be described and explained in the empirical sections below. Success in this endeavour may ultimately be judged by how well attitudes toward schooling, as measured, are able to explain enrolment decisions, *ceteris paribus*.

The Model

The theoretical framework used has been adapted from that of a model of investment in education (for example, King and Hill 1993). The approach employed here is innovative in that attitudes toward schooling are treated as endogenous. This makes possible a study of the determinants of attitudes and the influence of attitudes upon investments in education.

A simple one-period model is proposed in which households derive utility, U , from consumption of general goods and services, C , and from consumption of education, E .

$$(1) \quad U = U(C + E)$$

Consumption of general goods and services, C , depends upon preferences regarding goods and services consumption and is treated as exogenous ($C = \check{C}$). Consumption of education, E , depends upon preferences regarding education, A_e , which are a function of expected returns to schooling for the household, R_e , a vector of parental- and household-specific factors (e.g., parents' education, household income, etc.), X , and exogenous attitudes, $\ddot{A}$.

$$(2) \quad E = E\{A_e(R_e, X, \ddot{A})\}$$

Expected returns to schooling, R_e , comprise discounted expected benefits, B_e , less the costs of schooling, F_e .

$$(3) \quad R_e = B_e - F_e$$

Expected benefits of schooling, B_e , depend upon parental perceptions of expected future income of the child, Y_p , and the rate of transfer of income from child to parent, r , which will be treated as exogenous to simplify the model.

$$(4) \quad B_e = B_e(rY_p)$$

Perceptions of expected future income of the child, Y_p , will be a function of education, E , and experience in the labour force (or on the farm), L . Perceived quality of the local school, Q_p , conditions the expectation of future benefits derived from schooling.¹ A simple linear form of the 'perceptions of future benefits of education' production function is assumed.

$$(5) \quad Y_p = aE + bL + cQ_p$$

Education, E , and experience, L , are constrained to sum to T , total time available for school or labour.

$$(6) \quad T = E + L$$

Hence, (5) may be re-written with experience, L , expressed in terms of education, E :

$$(7) \quad Y_p = aE + b(T - E) + cQ_p$$

Substituting this expression for expected income, Y_p , into the expected benefits of schooling equation gives the following expression:

$$(8) \quad B_e = B_e\{r[aE + b(T - E) + cQ_p]\}$$

¹ Perceived quality, Q_p , depends upon actual school quality, Q_a , and a set of parental- and household-specific characteristics affecting the ability to perceive quality accurately (e.g., parents' education, parents' innate ability, number of children, etc.), Z [i.e., $Q_p = Q_p(Q_a, Z)$]. Availability of school places, S , and actual school quality, Q_a , also affect education investments directly by limiting the number of years of schooling which may be obtained and the outputs of schooling (e.g., cognitive skills) acquired [i.e., $E = E(S, Q_a, \dots)$]. However, to simplify the model, a sufficient supply of school places of a reasonable quality is assumed, and quality perceptions are treated as exogenous.

Costs of schooling, F_e , are composed of direct costs, such as school fees and other school expenses, d , and the opportunity cost of schooling, which is given by the wage (or shadow wage) available to child labour in paid employment (or in terms of household production), w . To simplify the model, costs are assumed to rise linearly with consumption of education, E .

$$(9) \quad F_e = (d + w)E$$

Then, the full expressions for expected returns from schooling may be substituted into (2), and preferences for education, A_e , may be substituted into the utility function (1).

$$(10) \quad A_e = A_e \{ [B_e(r(aE + b(T-E) + cQ_p)) - (d+w)E], X, \ddot{A} \}$$

$$(11) \quad U = U \{ \check{C} + E \langle A_e([B_e(r(aE + b(T-E) + cQ_p)) - (d+w)E], X, \ddot{A}) \rangle \}$$

The following budget constraint, β , holds: general consumption expenditure (pC) plus expenditure on the consumption of education (dE) must equal exogenous household income, V , plus earnings of children.

$$(12) \quad p\check{C} + dE = V + w(T-E) \Rightarrow (V + wT - p\check{C}) - (w + d)E = 0$$

Utility is maximised by choosing E so as to optimise (11) given (12), using the Lagrangian function (where λ is the *Lagrange multiplier*):

$$\begin{aligned} \mathcal{L} = U \{ \check{C} + E \langle A_e([B_e(r(aE + b(T-E) + cQ_p)) - (d+w)E], X, \ddot{A}) \rangle \} \\ + \lambda [(V + wT - p\check{C}) - (w + d)E] \end{aligned}$$

In equilibrium, where $E = E^*$, two first order conditions (FOC) must hold:

$$\text{FOC 1:} \quad \delta \mathcal{L} / \delta \lambda = (V + wT - p\check{C}) - (w + d)E = 0$$

$$\text{FOC 2:} \quad \delta \mathcal{L} / \delta E = \delta U / \delta E + \lambda (\delta \beta / \delta E) = 0$$

Solving for FOC 1 gives the familiar budget constraint shown above (see 12). Solving for FOC 2 may be achieved in two stages as follows:

$$\begin{aligned} 1^{\text{st}} \text{ stage:} \quad \delta U / \delta E &= (\delta U / \delta A_e)(\delta A_e / \delta E) = (\delta U / \delta A_e)[\delta A_e / \delta B_e - (d+w)] \\ &= (\delta U / \delta A_e)[(\delta A_e / \delta B_e)(\delta B_e / \delta E) - (d+w)] \\ &= (\delta U / \delta A_e)[(\delta A_e / \delta B_e)(a-b)r - (d+w)] \end{aligned}$$

$$2^{\text{nd}} \text{ stage:} \quad \delta \beta / \delta E = - (d+w)$$

where: $\delta U / \delta A_e \geq 0$, $\delta A_e / \delta B_e \geq 0$, $r \geq 0$, $d \geq 0$, $w \geq 0$, and the sign on $(a-b)$ is undetermined.

Predictions of the Model

1. Attitudes toward education are treated as endogenous in this model. They are an increasing function of the benefits and a decreasing function of the costs of schooling. However, preferences for education are mediated by other exogenous factors, including individual and family background as well as site-fixed effects.
2. Utility derived from education will be higher the greater the weight given to the role played by education in perceptions of expected income, a , and the lower the weight given to the role played by experience, b . Including returns to experience in the model is particularly relevant in the context of rural Ethiopia, where farm methods in many areas are fairly traditional, and farm know-how is passed from father to son. Thus, the trade-off between time spent in school and time spent in household production consists of more than the opportunity cost of time in the present. There is also an opportunity cost in terms of future returns to experience attained today.
3. Utility from education will be higher, the higher the expected rate of transfer of future income from child to parent, r . The expected rate of transfer depends upon characteristics of the child which increase the likelihood that parents will receive transfers from the child in the future. If parents expect their daughters to live with their in-laws and their sons to live with them in the future, the expected rate of transfer will be lower for daughters than for sons. This may partly explain the gender gap in enrolments.
4. Utility will be higher the lower are the direct, d , and opportunity, w , costs of schooling. This enters the model in two ways: first, utility derived from consumption of education is lower as direct and opportunity costs rise; second, the budget constraint indicates that if the costs of education rise, for a given amount of education and general prices, consumption of other goods and services must fall. Hence, utility derived from consumption of other goods and services will be lower the higher are direct and opportunity costs of schooling. Differences in opportunity cost may explain why boys are more likely to attend school than girls, if girls' labour is more important to household production. Differences in the direct costs of schooling may explain why children in some parts of the country are more likely to attend school than those in other parts of the country.

Empirical Application of the Model

The model outlined above will be estimated empirically in two stages. The first part of the paper will examine the determinants of attitudes toward schooling. The role of attitudes toward schooling in explaining enrolment will be considered by including information on parental attitudes and perceptions in an equation explaining current school enrolment.

$$(1) \quad A_e = A_e[R_e(B_e, F_e, Q_p), X]$$

$$(2) \quad E = E[A_e, B_e(r, Q_p, Z), F_e]$$

where: A_e are preferences regarding education; E is household demand for education; R_e are expected returns to schooling for the household; B_e are expected benefits of schooling; F_e are direct and opportunity costs of schooling; Q_p are perceptions of local school quality; X is a set of parental- and household-specific factors (e.g., parents' education, household income, etc.); r is

the rate at which children are expected to remit future earnings to their parents; and Z are exogenous influences upon the expectation of schooling benefits.

In practice, it is not possible to estimate total household demand for schooling, E , owing to data limitations. The household may include school-age children whose schooling has not yet started or has started but is not complete. Furthermore, to estimate educational attainment of adults, information is needed on household and village resources for adults during the time when they were of school-going age. Such data are not available. Instead, the probability of enrolment of current school-age children will be estimated using probit techniques and no attempt will be made to estimate years of schooling demanded. Given that enrolment ratios are extremely low in rural Ethiopia, this approach will produce relevant findings.

3. Data

Data for this study are drawn from two related surveys: (1) the Ethiopia Rural Household Survey (ERHS), conducted by the Department of Economics, Addis Ababa University, in collaboration with the Centre for the Study of African Economies, Oxford, in 1994; and (2) the Education Sub-Sample Survey (ES-SS), conducted by the author, in 1995.

The ERHS covered 1477 households in 18 Peasant Associations (villages) spanning 15 *woredas* (districts) in six regions. Together, the 15 sites provide a realistic mix of cultivation categories and standard of living strata and reflect most of the important agro-economic variations found in rural Ethiopia.² Each household was surveyed three times within approximately twelve months (early 1994, later in 1994 and early in 1995), providing a picture of both current production, consumption and other activities and the household's historical background. The first round included a few key questions on educational status and attainment which were augmented by more detailed information on education and training in the second round. A few questions on attitudes toward schooling were included in the third round.

Owing to the scope of the Ethiopia Rural Household Survey, the volume and breadth of questions asked on education-related issues was necessarily limited. Information on investment in human capital from the ERHS was supplemented by a purpose-designed survey of household human resources in four of the 15 sites (the Education Sub-Sample Survey or ES-SS), conducted under the author's supervision in one round during August 1995. The ES-SS provides information on attitudes toward schooling, perceptions of school quality, innate reasoning ability, and cognitive skill for household heads and spouses. Within the four sites selected, all households covered by the ERHS were surveyed. Information from the focused survey of human resources (ES-SS) has been matched with that from the broader survey of other household resources (ERHS), providing sufficient data with which to investigate the formation of attitudes and the determinants of enrolment.

The inclusion of questions designed to elicit attitudes toward schooling is a fairly unique feature of the Education Sub-Sample Survey. Attitudinal questions were developed based on a study of similar educational attitude questionnaires and advice from the psychological literature on attitude survey design (Oppenheim 1992; Ajzen and Fishbein 1977; 1980;

² Bevan and Pankhurst (1996) provides detailed information on each of the sites.

Bentler and Speckart 1981; Aleen et al. 1992; Dawes 1972; Eiser 1988; Liska 1975; Upmeyer 1989; Zanna et al. 1982; Fredericks and Dossett 1983).

All household heads and spouses included in the Education Sub-Sample Survey were questioned on their attitudes toward formal schooling, whether or not they have school-age children. The results are provided in tabular form in Appendix 1.³ The figures presented show that attitudes toward schooling are generally positive. More than 70 percent of household heads gave pro-schooling responses to most of the agree/disagree statements.⁴ Questions designed to allow respondents to demonstrate the strength of their preferences for education elicited similarly enthusiastic results. These findings suggest that, although household decision-makers may send few - if any - of their children to school, they do value education.

4. Determinants of Parental Attitudes To Schooling

Attitude Indexes

Before econometric analysis of the factors influencing attitudes may be undertaken, responses to the attitude questions described above must be quantified. There are several possible methods which may be employed. The method preferred by Vella (1994), in a study of a group of young Australian women's attitudes towards gender roles and educational investment choices, is to create an attitudinal index by summing numerically ordered responses to individual questions. Following Vella, responses to the attitude questions discussed in the preceding section were coded numerically and summed to give the total score on attitudes toward formal schooling. The frequency distribution of total attitude index scores is provided in Figure 2. Bimodality in the index probably occurs because of the inclusion of the imaginary situation questions, which permit higher scores for respondents with very strong preferences for schooling. Re-coding these questions to give everyone with a positive response a score of at most one resulted in a unimodal distribution of scores with a mean and mode of approximately 13.

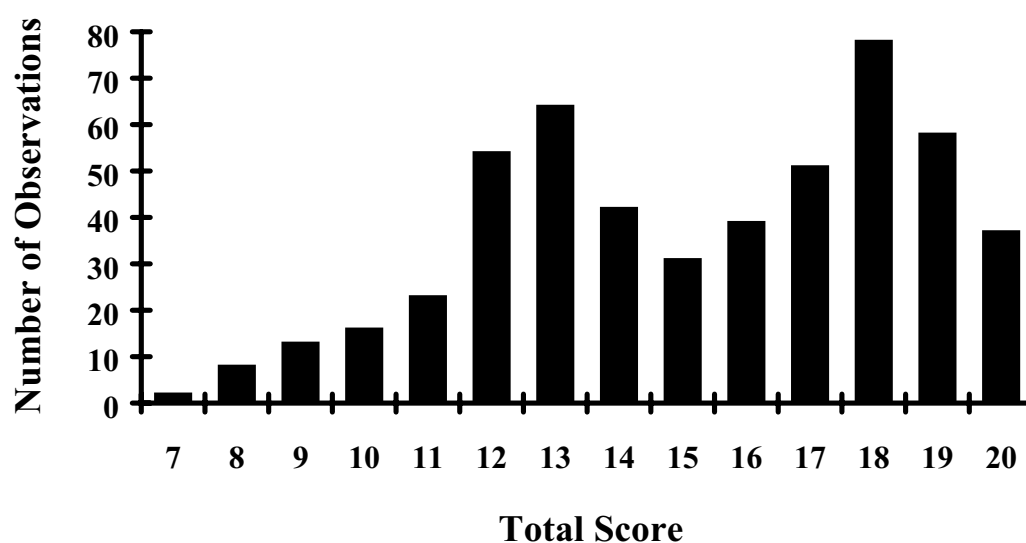
Vella (1994) cautions that there are potential problems with summing responses to individual attitude questions. Firstly, responses to particular questions may have different meanings for different people. Secondly, summing scores artificially assigns equal weight to each question. Thirdly, respondents may provide answers which do not accurately represent their attitudes, perhaps owing to insufficient self-awareness or perhaps because they strive to present what they feel are appropriate answers. Finally, attitudes conveyed be biased because of respondents' *ex post* rationalisation of their behavioural choices. Before proceeding with econometric analysis of the determinants of parental attitudes toward schooling, it is necessary to ensure that the index accurately represents responses on the individual questions. Following Vella, the attitude index constructed above was subject to a series of tests to demonstrate that the index score is correlated with responses to individual questions and that it is consistent

³ For clarity, only the responses of the household head are reported. The same pattern is found for spouses, although slightly smaller percentages expressed positive attitudes towards schooling, even on questions pertaining to girls' schooling in particular.

⁴ A notable exception is the statement that 'education makes a boy a better farmer' (see 8). Respondents and 'experts' alike disagree on the value of schooling to agricultural productivity. See Weir (1999) for some empirical evidence on this topic for rural Ethiopian farmers.

with other evidence on parental preferences regarding schooling. In each case, the evidence suggests that the attitude index used here provides a good proxy for parental attitudes to schooling. See Appendix 2 for details.

Figure 2
Index: Attitudes to Schooling (0-20)
Household Head and Spouse



**The total score on this index is the sum of positive answers
to questions intended to elicit attitudes to education**

Attitude questions from the Education Sub-Sample Survey may be categorised according to exogenous/social and endogenous/economic criterion and by gender. This permits the creation of sub-indexes of attitudes, from sub-sets of the questions, as follows: attitudes based on economic considerations for both boys and girls; attitudes based on economic considerations pertaining to girls alone; attitudes based on social/status issues for boys and girls; attitudes based on social/status issues which apply to girls alone.

The sub-indexes should be highly correlated with one another. However, it is likely that for some parents, a range of scores may be registered on the various sub-indexes. Parents may have different motivations for wanting education: economic gain or fulfilment of social norms. They may have different views about education for girls in particular than for education generally. Means, standard deviations and the range of scores for each attitude sub-index are given in Table 1. Such variations may be important in explaining enrolment choices for particular children within a household.

Table 1
Summary of Attitude Sub-Index Scores

	Mean	Std. Dev.	Range	N. Obs.
Economic Sub-Index	3.95	0.82	1 - 5	583
Economic/Girls	1.69	0.49	0 - 2	618
Social Sub-Index	4.62	1.07	1 - 6	559
Social/Girls	2.35	0.75	0 - 3	590
Total	8.56	1.50	3 - 11	539
Total/Girls	4.05	0.99	0 - 5	585

Explaining Attitude Formation

To understand the formation of attitudes toward schooling, as measured by scores on the attitude index, sets of individual and household variables will be considered. It is important to control for community fixed effects as there are a number of factors at the site level which are expected to influence attitudes, including the quality of schooling available locally, opportunities for formal sector employment and further education, and historical exposure to formal schooling and modern ideas. A lack of degrees of freedom and full information prevents inclusion of each of these variables separately in the regression analysis.

A summary of variable definitions and means (based on the sample used for regression purposes) is provided in Appendix 3. Data on cognitive skill and non-verbal reasoning ability were collected to control for both native ability and the quality of schooling received by those with some formal or non-formal education. Respondents were also asked to rate the quality of the local primary school in terms of its teachers and other resources. This information is included as a set of dummy variables ranging from zero (both teacher and school resources are thought to be poor) to four (both are thought to be good, rather than merely adequate). The possibility that the respondent was unable to provide an opinion on school quality is also captured. A quality perception index was created. However, it is not employed here as doing so would have resulted in the loss of 118 observations owing to missing information on school quality perceptions.

To attempt to explain the factors affecting attitude formation, Ordinary Least Squares regression equations were estimated with score on the attitude index as the dependent variable, and various individual and household variables as explanatory regressors, controlling for site specific fixed effects with the inclusion of site dummy variables. Respondents with less exposure to formal schooling or fewer opportunities to benefit from education are expected to be less interested in schooling and to hold less positive views. The findings are presented in Table 2. The determinants of attitudes are estimated for all respondents together and for heads and spouses separately.

Table 2
Ordinary Least Squares Regression Results
Dependent Variable: Attitude Index Score

	Eqn. 1 (All)	Eqn. 2 (Head)	Eqn. 3 (Spouse)
CONSTANT	8.55 ***	5.32 *	8.47 ***
AGE_YRS	0.10 **	0.15 ***	0.11
AGE_YRS2	-0.00 *	-0.00 ***	-0.00
FEMALE	0.05	0.16	1.07
FEM_HEAD	-0.35		
MARRIED	-0.24	-0.23	-0.16
EDU_FORM	-0.24	0.72 *	-1.61
EDU_NONF	-0.40	0.53 ✓	-1.60***
EDFORMYR	0.19 ***	0.17 ***	0.21 **
EDREPEAT	-2.46 ***	-2.60 ***	-2.75 ***
EDREPTYR	0.88 ***	0.85 ***	1.15 ***
COGNITIVE	0.01	-0.04 *	0.10 **
RAV_FULL	-0.01	-0.03	0.01
MOTH_ED	0.20	0.06	0.68
FATH_ED	-0.24	-0.54 ✓	0.19
KID	0.06	0.62	-0.36
N_KIDS	0.09	-0.09	0.22 ***
HH_SIZE	-0.16 **	-0.11	-0.20 ***
CONSAE	-0.00	-0.00 *	0.00
COST_SCH	-0.37 ***	-0.43 ***	-0.32 ***
LAND_PC	0.67	3.38 ***	-2.74 ✓
REL_MUSL	0.48 ***	0.94 ***	0.08
BEN_EMP	3.45 ***	4.62 ***	3.51 ***
QUAL_1	1.17	1.37	1.15 ✓
QUAL_2	0.75	0.95	0.78
QUAL_3	0.76	0.91	0.92
QUAL_4	0.12	0.24	0.20
QUAL_MIS	-0.09	-0.16	-0.09
SITE B	1.48 ***	1.55 ***	1.37 ***
SITE C	3.27 ***	4.43 ***	2.04 ***
SITE D	0.40	1.72 ✓	-0.95
Adjusted R ²	0.16	0.17	0.14
Number of Observations	487	264	223

Note: Standard errors have been adjusted to account for the clustered nature of the data. Stars indicate significance using a two tailed t-test as follows: *** = 0.01; ** = 0.05; * = 0.10; ✓ = 0.20.

Equation 1 is estimated for all respondents (heads and spouses) combined. Of the first set of regressors - demographic characteristics - only age is significant. Age has a positive effect on attitudes to schooling, with scores on the attitude index increasing with age at a decreasing rate. Perhaps older respondents formed their views on schooling at a time when secondary school graduates were relatively scarce and wage employment in towns and cities was virtually guaranteed for those who finished school. This is not true today, and many high school graduates find themselves unemployed. This may explain why older respondents are more positive in their views of schooling than are younger respondents.

Attitudes towards schooling may be influenced by exposure to education, particularly formal schooling. Indeed, to the extent that the choice of whether to attend school was made by the respondent, this relationship may be endogenous. However, the decision to initially enrol will, in many cases, have been made for respondents by their parents. Thus, it is unlikely that the formal education dummy variable is endogenously related to attitudes. This caution is more aptly applied to the years of formal education variable, since continued enrolment in formal schooling may depend upon attitudes toward education. In some households, older children may be able to decide whether or not they wish to continue their schooling.

The indicator variables for some formal schooling and for non-formal education are both negative, but insignificant, while years of formal schooling is positive and significant at the one percent level. This suggests that attitudes to schooling are not formed during non-formal educational experiences or brief stints of enrolment in formal schooling. Time spent in formal education is necessary to create positive attitudes toward schooling.

Whether or not a person has repeated a year of school and the number of years repeated may also influence attitudes. Those who have failed and been forced to repeat a grade may be expected to have less enthusiasm for schooling than others. However, it is relatively uncommon to repeat in rural Ethiopia, as most children who fail simply drop out of school. Repeaters may be highly committed to schooling, particularly those for whom more than a single year was repeated, suggesting a potentially endogenous relationship between repetition of one or more year of schooling and attitudes toward education. We find that having repeated at least one year of schooling tends to be associated with less enthusiasm for education. However, repeating more years has a positive effect on attitudes.

Cognitive skills include literacy and numeracy. Those who have obtained more skills as a result of formal or non-formal schooling are expected to hold more positive attitudes than others. Combined score on the literacy and numeracy tests of cognitive skills has the anticipated positive, though not significant, impact on attitudes. Score on Raven's Progressive Matrices test of non-verbal reasoning ability has a rather small, insignificant, effect upon attitudes toward schooling.

The mother's and father's education variables are included to capture attitudes transmitted to the respondent from their parents which are owing to parental experiences of education. Simple dummy variables representing any type of education, including non-formal schooling, are used because so few of the respondents' parents had attained any formal schooling at all. Parents' schooling is expected to have a positive influence on attitudes. However, whether or not the respondents' parents attended school had no significant effect on their attitudes towards schooling. There may be too little variation in these regressors to identify a significant relationship. The difference in signs on the two dummy variables suggests that having an educated mother is more useful to the development of positive attitudes toward schooling than having an educated father.

The next set of variables represented are demographics of the household. Respondents with children of school-going age may express different attitudes towards schooling than those who do not have to make enrolment decisions in practice. Those with school-aged children may have given careful consideration to the schooling decision and weighed the pros and cons of sending their children to school in the light of their opinions about schooling. They may feel self-conscious about the attitudes they express in comparison with the actual choices they

have made for their family. Respondents without school-aged children have the luxury of expressing their idealised attitudes about education without having to reconcile these feelings with reality. For those who do not have school-aged children, the benefits of schooling are more remote, suggesting a tendency toward more negative attitudes. However, parents who do not send their children to school may feel that they cannot express strongly positive views on schooling in the light of their actual behaviour, leading to less positive attitudes for those who have children of school-going age.

Contrary to expectations, the variables related to having school-aged children, though insignificant, are both positive, suggesting that parents of school-aged children are not afraid to express their understandably stronger enthusiasm for schooling. Household size has a significantly negative effect on attitudes. Given that the number of school-aged children in the household has been taken into consideration, the negative coefficient on household size implies that the greater the number of adult household members or very young children, the more negative will be attitudes toward schooling. If it is the number of pre-school aged children which drive this result, it suggests that parents of young children may prefer their older children to stay at home and help with child minding, rather than go to school.

The direct cost of schooling is proxied by COST_SCH, which was obtained by calculating the average school fee as a percentage of consumption per adult equivalent in the household for households with at least one school-aged child. Households with no school-aged children were assigned a value of zero for this variable. The advantage of this specification (as opposed to use of the school fee variable on its own) is that it takes into account the affordability of sending a child to school for each household. Furthermore, dividing school fees by household income removes the correlation between average school fees in each site and other site-level variables. The higher the percentage of school fees in household income, the lower attitudes toward schooling are expected to be. This is precisely what was found. By contrast, the coefficient on household land holdings per child was positive, but insignificant, indicating that this aspect of the opportunity cost of schooling does not play a major part in explaining attitudes.

Religion may affect attitudes toward education. Muslim households may be less inclined to send their children, particularly girls, to school owing to cultural objections to non-Muslim educational provision. However, a study of enrolment decisions in Pakistan showed that when appropriate schooling is available, Muslim households were as likely as those of other religions to send their children, even girls, to school (see Alderman et al. 1993). This suggests that Muslims do value schooling. The highly significant positive coefficient on the dummy for being Muslim indicates that this is indeed the case in rural Ethiopia.

Perceptions of the benefits of schooling in terms of agricultural productivity and wage employment are proxied by BEN_AGR and BEN_EMP. The first is a dummy variable set equal to one if the respondent agreed that boys who go to school are better farmers than those who do not. The second variable is a dummy assigned a value of one for those who said that they wanted their son to go to school to get a better job than they have.⁵ The results indicate

⁵ BEN_AGR was removed from the attitude index owing to lack of correlation (see Appendix 2). Therefore, it may be expected not to have a significant effect on attitudes, unless controlling for individual and household characteristics reveals an underlying relationship. BEN_EMP was included in the attitude index, though it was not significantly correlated with it. Thus, if perceptions of the employment benefits of schooling are found to significantly influence attitudes, it will not be simply owing to its inclusion in the index.

that respondents who perceive benefits to schooling in terms of increased job opportunities tend to have more positive attitudes toward schooling. The same equation was estimated with the dummy variable for perceived benefits of schooling in agriculture (not shown). However, the belief that going to school will make a boy a better farmer was found to have no influence on attitudes to schooling.

Perceptions of local primary school quality are captured by the dummy variables, QUAL_0 to QUAL_4 and QUAL_MIS. Higher ratings of school quality ought to be associated with more positive attitudes toward schooling, since better primary school quality increases the potential benefits of schooling in terms of continued education. Those who had no opinion on school quality are likely to have little interest or experience with formal schooling and, therefore, to value it less highly than others.

The results for the quality perception ratings dummy variables are somewhat unexpected. Each of the included categories has a positive coefficient, suggesting that a non-zero assessment of local school quality is associated with higher scores on the attitude index. However, none of the quality perception indicator variables are significantly different from zero. The coefficients on the quality dummy variables decline monotonically as perceived school quality rises. Missing observations on school quality perception are associated with comparatively negative attitudes to schooling, though the difference between this category and those who rate school quality as zero is also not significant. It seems that having controlled for actual school quality differences between the sites, by the inclusion of the site dummy variables, information on individual perceptions of school quality does not help to explain attitudes toward schooling.

Site dummy variables are included to account for the influence of site fixed effects upon attitudes. These include observable factors, such as the distance from the centre of the village to the nearest primary and secondary schools, town, and all-weather road. Those living nearer to school are expected to have more exposure to schooling and to value it more highly. Similarly, living near to town or a good road increases the potential benefits of schooling in terms of wage employment and the opportunity to sell surplus agricultural output. Although observable, these variables are not included separately in the regression because the small number of sites results in insufficient degrees of freedom to test these hypotheses.

An advantage of using site dummy variables is that these also incorporate unobservable site characteristics, such as the extent of school outreach efforts, which may influence attitudes toward schooling. The omitted category is Site A. This site has the lowest rate of school participation of the four sites, suggesting that it will also be associated with less positive attitudes toward schooling. As expected, respondents in Site A have significantly lower attitude scores than those in either Sites B or C. While the coefficient on Site D is also positive, the difference between Sites A and D is not significant.

Equations 2 and 3 illuminate differences in attitude formation for heads of household and spouses. The dummy variables for having some formal and some non-formal schooling both have a negative impact upon spouses' attitudes toward schooling, significantly in the case of non-formal schooling. However, for heads, both dummy variables are positive. On the other hand, cognitive skills acquired in school have a positive effect upon spouses' attitudes and a negative effect upon heads' attitudes. Nevertheless, the effects of additional years of schooling and of repeating one or more grades of school are the same for both groups of respondents.

Together, these results suggest that spouses' attitudes benefit from extended exposure to schooling and greater accumulation of cognitive skills. Heads' attitudes toward schooling benefit from even short periods of schooling but those who acquire more cognitive skills for a given number of years in school will tend to hold more negative views on schooling. This may reflect some sample selectivity bias in that heads who were successful in school but who were not able to obtain urban employment (as is often the expectation for boys) have reason to view schooling as unnecessary and not useful. Additional support for this explanation is that father's education has an almost significantly negative effect upon the heads' attitudes, while the effect of both mother's and father's education upon spouses' attitudes is positive, though not significantly so.

Spouses' attitudes respond significantly to the number of children (positively) and household size (negatively). Neither variable is important in the formation of the head's attitudes. Higher per capita land holdings are associated with significantly positive attitudes toward schooling for the head and almost significantly negative attitudes for the spouse. These results indicate that spouses' attitudes are more influenced by considerations of the opportunity costs of schooling (land per capita and households size for a given number of children) than are heads' attitudes. Both heads' and spouses' attitudes respond negatively to higher direct costs of schooling as a percentage of consumption per adult equivalent.

Finally, the religion dummy variable is important for the head but not the spouse. Muslim heads of household tend to hold more positive views on schooling than their Christian counterparts. However, Muslim spouses' views are not significantly different from those of Christian spouses. Furthermore, the site dummy variable coefficients are smaller for the spouses than for the heads. These results suggest that spouses (who are generally female) have more in common in terms of their attitudes toward schooling, irrespective of age, site or religion, than do heads (who tend to be male).

The adjusted R^2 values reported here seem low (0.14 to 0.17). However, given the nature of the dependent variable and the numerous unobserved factors influencing individual attitudes, they are reasonable. They compare quite favourably with the values of 0.05 to 0.08 reported by Vella (1994, 198-99).

Testing for Endogeneity in the Attitude Equation

Certain variables may be endogenously related to attitudes toward schooling. The most likely candidates are years of formal schooling and years repeated. If so, estimated coefficients will be biased. To avoid this problem, it is necessary to test for the problem of endogeneity in the attitude equations and replace endogenous regressors by instrumental variables estimators.

Reduced form equations were estimated for each of the potentially endogenous regressors. The Heckman correction procedure was used to adjust for bias owing to the large number of zero observations on years of schooling and years repeated. Relevant and uncorrelated instruments were identified (see Bound, Jaeger and Baker 1995). Fitted values were extracted from the reduced form regression equations including instruments, and the Hausman test for endogeneity was performed. It was not possible to reject the null hypothesis of weak exogeneity (that the fitted values are jointly equal to zero) at the five-percent significance level ($F_{2,3} = 2.33 < F_{2,\infty}^{0.05} = 3.00$). This analysis suggests that it is not necessary to replace years of education or years repeated by instrumental variables.

Weighing of the Results

The substantive effects of the determinants of attitudes may be considered by simulating attitude scores in response to changes some of the variables of interest. Using the coefficients estimated in equations 2 and 3 (see Table 2) and information on the mean and standard deviation of each regressor (see Appendix 3), simulated attitude scores have been calculated for various categories of respondent. Since attitude toward schooling is a latent variable and score on the attitude index is a proxy for unobservable attitudes, predicted scores on this index for individuals with various features should not be taken as precise estimates of a concrete phenomenon. Therefore, percentage change comparisons of the effects upon attitudes of various simulations are used to illustrate substantive differences between heads and spouses on the two attitude indexes (see Table 3). For the most part, the substantial findings reflect significance of the coefficients described above. However, considering the substantive effects reveals a few interesting variations.

Mothers' and fathers' education were not significant in determining attitudes, perhaps because so few parents of the household heads and spouses in the survey had any schooling. Thus, it is noteworthy that reasonably substantial changes in attitudes are induced by having a mother or father who has been to school. In the case of spouses, if either parent has any schooling, the effect upon attitudes is positive. However, for the household heads, mother's education has a small positive effect, whereas the effect of father's education is stronger and negative. Once again, the negative impact of father's schooling upon head's attitudes may reflect unfulfilled expectations for employment, if these educated fathers were not able to exploit their education to obtain wage employment.

Almost all respondents said that they expected educated children to obtain better jobs than those without education. Those who disagreed with this statement tended to have much more negative attitudes toward schooling, as evidenced by the very substantial difference between the two groups. Here, the differences between heads and spouses is small. The strength of this effect lends support to the explanation of negative attitudes toward schooling for heads with educated fathers or with high scores on the Raven's test or cognitive skill test.

Perceptions of local primary school quality were not found to significantly influence attitudes toward schooling. However, the substantive effect of rating school quality as one (as opposed to zero) is fairly strong for both heads and spouses. Rating school quality above one tends to be associated with much smaller effects on attitudes. Attitudes for those who are missing information on school quality tend to be very similar to attitudes for those who give local school quality the lowest possible rating.

Although the cost of schooling as a percentage of household consumption per adult equivalent was highly significant in the regressions, the substantive impact of a change in this variable is rather small. Increasing the proportion of school fees in household expenditure by an extremely large factor (from zero to 87 percent) reduces attitudes toward education only moderately. Thus, heads and spouses will not be seriously dissuaded from appreciating education by a rise in school expenses. However, this is not to say that actual enrolment will not be affected by the introduction of higher school fees, since parents may value schooling but simply not be able to afford to send their children to school.

Table 3
Predicted Attitude Scores (Percent Change)
Attitude Index, Head versus Spouse

	Att. Index (Head)	Att. Index (Spouse)
EDU_FORM: 0 to 1	6.16	-9.47
EDU_NONF: 0 to 1	3.51	-10.94
EDFORMYR: 0 to 6.21	12.29	-1.87
EDFORMYR: 1 to 6.21	5.77	8.39
EDREPEAT: 0 to 1	-11.23	-11.83
COGNITIVE: 0 to 10.67	-2.77	7.85
RAVENS: 5 to 36	-5.36	2.87
MOTH_ED: 0 to 1	0.43	4.73
FATH_ED: 0 to 1	-3.59	1.28
BENEMP: 0 to MEAN	-30.64	-24.00
QUAL1 (vs. QUAL0)	9.29	8.01
QUAL2 (vs. QUAL1)	-2.60	-2.38
QUAL3 (vs. QUAL2)	-0.29	0.95
QUAL4 (vs. QUAL3)	-4.24	-4.72
QUAL_MIS (vs. QUAL0)	-1.08	-0.59
COST_SCH: 0 to 0.87	-2.51	-1.92
REL_MUSL: 0 to 1	6.30	0.55
SITE B (vs. SITE A)	11.67	9.90
SITE C (vs. SITE A)	33.43	14.77
SITE D (vs. SITE A)	12.95	-6.90
Mean Attitudes	15.00	14.50

Note: Since several of the regressors are interrelated, it is often necessary to change more than one variable at once. Specifically, EDU_FORM=0 assumes EDFORMYR=0, EDREPEAT=0, and EDREPTYR=0; EDU_FORM=1 assumes EDFORMYR=1, EDREPEAT=0 and EDREPTYR=0; EDFORMYR=6.21 assumes EDU_FORM=1, EDREPEAT=0 and EDREPTYR=0; EDREPEAT assumes EDU_FORM=1, EDFORMYR=2 and EDREPTYR=1.

To summarise, predicting changes in attitudes toward schooling by simulating changes in the values of key variables provides evidence on the substantive, as opposed to the significant, effects of these regressors in determining attitudes. This exercise revealed several interesting differences between substantive and significant effects. Most notably, costs are highly significant in explaining attitudes, but have a relatively small substantive effect, whereas parental education was insignificant in the attitude regression but may have quite substantial effects upon attitudes nonetheless.

5. Determinants of School Enrolment

Data from the four Education Sub-Sample Survey sites will be used to estimate the probability of school enrolment amongst school-age children. The sample consists of those aged 7 to 18 years who are not listed as head or spouse of the household and for whom the relevant data are available. See Appendix 3.

The marginal effects of each variable upon the probability of enrolment are presented in Table 4. For continuous variables, the number reported indicates the increase in the probability of enrolment associated with a unit change in the regressor. For dummy variables, the change in probability of enrolment associated with a change in the regressor from zero to one is reported.

The first equation includes likert⁶ attitude index scores for the head and spouse, while scores on the economic and social sub-indexes of attitudes are presented in the second equation. The relative importance of the attitudes of the household head versus the spouse will depend upon how decisions are made within the household.

More favourable parental attitudes toward schooling should have a positive effect upon the probability of enrolment. Similarly, if parents believe that schooling improves farming ability or if the household head holds modern views on farming, a child should be more likely to go to school, given that there is some evidence to suggest that education is most important in a modernizing agricultural environment (Cotlear 1990; Lockheed, Jamison and Lau 1980; and Phillips 1994).

As expected, children living in a household where the head expressed modern attitudes toward farming are significantly more likely to be enrolled than those in more traditional households.⁷ Furthermore, if the head of household believes that boys who go to school are better farmers than boys who do not, the likelihood of attending school increases. This is interesting. Opinions of the value of education to farm productivity were not found to be important to the formation of attitudes toward schooling in the preceding section. However, this opinion does influence the decision to enrol a child in school, independently of more general education attitudes.

Table 4 shows that the coefficients on the attitude scores of both the head and spouse are positive, suggesting that parents who value schooling are more likely to send their children to school. However, the attitudes of the head appear to be considerably more important to the enrolment decision, as evidenced by the highly significant effect of the head's attitude score and completely insignificant result for the attitude of the spouse.

⁶ Responses were re-coded using a likert scale as follows: positive opinions are assigned a score of 1 (or higher), negative opinions are assigned a score of -1, and non-response is assumed to imply indifference and assigned a score of 0. A likert-style attitude index was used to avoid the problem of missing data on attitudes. In a prior regression where observations for which observations with missing data on attitudes were omitted, and the raw attitude indexes were used, very similar results were obtained for the coefficients on attitudes of the head and spouse as have been reported here for the likert attitude index variables.

⁷ Spouses' opinions on modern farming practices were not considered here because of the large number of missing observations from spouses, who do not usually concern themselves with agriculture. Spouses' opinions on the benefits of schooling for agriculture were included in a preliminary specification, but had no significant effect upon enrolment.

Table 4
Probit Estimation: Probability of Current Enrolment (marginal effects)
Dependent Variable: ENROLLED (1 if currently in school; else 0)

	Eqn. 4	Eqn. 5
AGE_YRS	0.09	0.12
AGE_YRS2	-0.00	-0.00 ✓
FEMALE	-0.14 **	-0.15 ***
CHILD_HEAD	0.22 ***	0.27 ***
BIRTH_ORDER	-0.03 ✓	-0.04 **
LIVE_PARENTS	-0.13 *	-0.13 ✓
CONSAE	-0.00	-0.00
FEMALE*CONSAE	0.00 **	0.00 *
HH_COST	-0.08	-0.13 *
LAND_PA	0.57 ✓	0.49 ✓
NUM_LT7	-0.06 *	-0.07 ***
NUM_GT59	-0.06	0.03
REL_MUSLIM	-0.29 ***	-0.27 ***
REL_XIAN	0.04	0.08
EDUC_H	-0.21 *	-0.20 ***
EDUC_S	0.01	-0.02
COGNITIVE_H	0.01 ✓	0.01 *
COGNITIVE_S	-0.01	-0.00
RAVEN_H	0.01 **	0.01 *
RAVEN_S	0.01	0.01
QUALITY_1_H	0.07	0.06
QUALITY_2_H	-0.28 ***	-0.27 **
QUALITY_3_H	-0.27 ***	-0.20
QUALITY_4_H	-0.34 ***	-0.29 ✓
QUALITY_MISS_H	-0.27 **	-0.23 ✓
MODERN_AGR_H	0.21 ***	0.20 ***
BENEFIT_AGR_H	0.18 ***	0.05
LIK_ATT_SCH_H	0.02 ***	
LIK_ATT_SCH_S	0.00	
LIK_ATT_EC_H		0.04 *
LIK_ATT_EC_S		0.06 ***
LIK_ATT_SOC_H		0.03
LIK_ATT_SOC_S		-0.02 ✓
SITE B	0.74 ***	0.69 ***
SITE C	0.48 *	0.48 **
SITE D	0.19	0.15
Pseudo R ²	0.29	0.30
Chi-Squared (2)	2.03	1.27
Log Likelihood	-179.1	-176.8
Number of Observations	387	387

Note: Standard errors have been adjusted to account for the clustered nature of the data. Stars indicate significance using a two tailed t-test as follows: *** = 0.01; ** = 0.05; * = 0.10; ✓ = 0.20.

The total attitude index is decomposed into attitudes related to economic considerations and attitudes motivated by social considerations (see equation 5). Here, it is clear that the attitudes

of both the head and spouse regarding the economic aspects of schooling are important to the enrolment decision.⁸ Attitudes related to the social effects of schooling play virtually no part in determining whether a particular child is in school. This decomposition indicates that with respect to the economic dimension of attitudes toward schooling, views of both the head and spouse are important. Indeed, the marginal effect of the spouses' attitudes toward schooling is slightly larger and more significant than that of the household head.

A set of variables closely-related to the attitude regressors are the dummy variables representing opinions on local primary school quality. Indeed, it was shown in the previous section that, although insignificant, perceptions of school quality may have substantial effects upon attitudes toward education. Thus, to the extent that parents believe school quality affects returns to schooling, children are expected to have a greater likelihood of enrolment in households where the head perceives school quality to be good. The results in Table 4 suggest that perceptions of local primary school quality by the household head appear to play an important role in determining enrolment. However, rather than encouraging school participation, high ratings of school quality are associated with a smaller likelihood of being currently enrolled. Children living in households where the head has given a rating of zero (or only one out of four) to local school quality are more likely to be enrolled than those from households where the head either did not provide a response or gave the school a high quality rating. What this result suggests is that there may be some endogeneity between the probability of enrolment and school quality ratings of the household head. Parents with children in school have more information on school quality than those who do not send their children to school. If parents with more exposure to actual school quality tend to be relatively pessimistic in their ratings of school quality, this may explain the results presented here.

Equation 5 was able to explain 30 percent of the variation in enrolment status in the sample. Given the potentially large effects of unobserved characteristics, such as motivation and ability (both mental and physical) of the child, this success rate is rather good. By comparison, estimating the equation without including parental attitudes or perceptions of school quality permits explanation of only 20 percent of the determinants of enrolment. A likelihood ratio test was performed to verify that the specification shown is preferred. This provides some empirical support for the study of preference and opinion variables, which are conventionally taken as given and overlooked in quantitative estimation of demand for schooling.

The importance of the attitude and opinion variables to the regression is further emphasised by an examination of site fixed effects. Site dummy variables represent unobserved site-level characteristics as well as such factors as the distance to school and actual school quality.⁹ In a previous specification (not shown) in which only the standard economic variables are included (e.g., attitudes and opinions are omitted), all three site dummy variables are positive and significant, indicating that there are site-specific characteristics which determine the probability of enrolment and that children are less likely to enrol in Site A (the omitted category) than in any of the other sites. However, the differences in enrolment probability is much less significant in equation 4. Indeed, once attitudes are taken into account, there is no significant difference in the probability of enrolment in Sites A and D.

⁸ The agricultural benefits dummy variable becomes insignificant here because it is included in the economic sub-indexes.

⁹ Though certain site characteristics are observable, specific site-related variables have not been used because there are only four sites and at most three site variables may be included. This small number of degrees of freedom limits the robustness of findings on individual site-level variables.

Table 4 shows that a number of factors exert an effect upon enrolment independently of attitudes, illustrating the divergence between desired investment in schooling and actual enrolment. Direct and opportunity costs of schooling are likely to play particularly important roles in the determining enrolment in the face of credit constraints. Household cost and land holding per adult variables were created to proxy direct and indirect costs of schooling, respectively, and both should be related negatively to the probability of enrolment. However, rather than acting as a deterrent to enrolment, having more land to harvest per adult increases, almost significantly, the likelihood of being in school. Thus, the land variable appears to act as a proxy for household income, and does not represent the opportunity cost of schooling. The negative coefficient on household cost indicates that direct costs of schooling as a percentage of household income do tend to reduce the probability of enrolment, an effect which is significant in the second equation.

The number of below school-aged children and the number of elderly people in the household may also affect the opportunity cost of schooling for children in rural areas where child labour contributes to farm income. Children in households with more dependants will have higher opportunity cost of schooling than those where there are fewer dependants, owing to the need for school-aged children to help care for younger children (or older adults in the household). However, older adults who are fit may substitute for child labour in the care of young children. The probability of enrolment is found to fall significantly with the number of below school-aged children in the household. Contrary to expectation, there is no significant effect of living in a household with more older adults. It may be that some older adults are themselves dependants and some are fit enough to substitute for the labour of school-aged children, thus obscuring the real effect.

Muslim children are less likely to attend school than Christian children, *ceteris paribus*. This is a very interesting finding, given that Muslim households were more likely to express positive attitudes toward schooling. It suggests that Muslim households would prefer to send their children to religious schools or that there are other religion-based constraints on schooling in rural Ethiopia.

Education of the household head and spouse have sometimes differing effects on the probability that a child will go to school. The marginal effect of coming from a household where the spouse has obtained some formal or non-formal education is effectively zero. However, living with an educated household head results in a 20 percent decline in the probability of school attendance. Fathers who did not acquire substantial cognitive skills as a result of their schooling may question the usefulness of formal education. Furthermore, educated fathers who have not obtained formal sector employment may feel that schooling is not useful in a rural context and may therefore discourage their children from enrolling in school. Cognitive skills acquired by the household head are found to play a small, positive role in encouraging school enrolment.

Innate ability, as measured by Raven's test score, may increase the likelihood of enrolment if parents with greater pre-school ability tend to appreciate the value of schooling for their children or if the children of parents with high innate ability also tend to have greater innate ability, which increases their chance of success in school. The results indicate that, after controlling for attitudes, it is the innate ability of the head, and not the spouse, which helps to determine enrolment choice. Raven's test scores of the head and spouse turn out to be highly

correlated. Given this, the insignificance of innate ability of the spouse indicates that it is ability of the head which matters to the enrolment decision. Ability of the spouse does not add to the probability of being enrolled.

Intra-household resource allocation issues - possibly involving some form of discrimination - must also be considered. For example, even controlling for parental attitudes, girls are significantly less likely than boys to be enrolled, and children or grandchildren of the household head are more likely to be enrolled than are other children living as part of the household. In economic terms, these results may be explained by the greater likelihood of remittances from sons than from daughters and from direct descendants than from other family members.

A child's place in the sibling birth order may influence the probability of enrolment. To the extent that first-born children are needed to help care for their younger siblings, those born later will be more likely to go to school. However, first-born children may have an educational advantage if they are expected to provide the earliest opportunity for educational returns.¹⁰ The results show that children born earlier are more likely to go to school than their younger siblings, indicating that the latter hypothesis is borne out.

To summarise, while clearly important to the decision to enrol, the results presented indicate that attitudes alone cannot be used to predict the probability of enrolment. Some households will be unable to send their children to school owing to resource constraints and other considerations. Some children will be denied education because of their unfortunate place in the sibling birth order, their sex or their relationship to the household head.

6. Conclusion

Attitudes represent a traditionally under-researched area in the literature on the determinants of enrolment in the developing world. Information on attitudes, controlling for demand and supply constraints upon schooling, can indicate something about what the desired level of private investments in schooling would be in an unconstrained environment. This is important for policy-makers where schooling is effectively non-mandatory and where the private economic benefits of education are uncertain and not entirely obvious.

The results presented here suggest that attitudes are measurable and can be at least partially explained by various individual and household characteristics, though there are many more factors at each level which are unobservable - some of which are beyond the scope of economic analysis. The most important factors affecting attitudes toward schooling are the education experiences of the respondent and a consideration of the costs and expected benefits of schooling. The latter finding was reinforced by evidence showing that those who had been to school but had not benefited as much as expected had lower opinions of the value of schooling than those who either did not attend school or those who did not expect their schooling to lead to better opportunities for employment for themselves. Perceptions of school

¹⁰ Lloyd and Gage-Brandon (1994) predict that first-born children have an educational advantage over middle children. However, they also predict that younger children may receive cash from their older siblings to pay for school expenses. Gomes (1984) found evidence of educational advantages of being first-born in Kenya. However, Parish and Willis (1993) find that late-born children are more educationally advantaged in Taiwan.

quality were not found to have an independent influence upon attitudes, though they may or may not act by affecting the expected benefits of schooling. Neither family background nor sex were found to play significant roles in determining attitudes. However, simulations suggested that the substantive effects of parents' education may be large.

The determinants of attitudes were found to be slightly different for heads and spouses. Specifically, heads were found to develop positive attitudes toward schooling through even short periods of schooling, whereas spouses who had ever enrolled tended to have more negative opinions on schooling than those who have never been to school. Furthermore, spouses appear to place more weight on the opportunity costs of schooling in their valuation of schooling than heads. Spouses varied less in their attitudes toward schooling across both site and religion than did heads.

The investigation of attitudes is interesting in itself, in that little is known about how attitudes and perceptions are formed in the developing world. An even more pertinent consideration, however, is the fact that attitudes and perceptions are usually unobserved in economic analyses but may be correlated with observed variables, potentially resulting in omitted variable bias. The data on attitudes and perceptions collected during the Education Sub-Sample Survey provided a unique opportunity to consider these conventionally unobservable, but clearly important, variables in an analysis of the determinants of school enrolment.

Scores on an attitude index were included in the enrolment probit equation. Econometric results revealed that attitudes are important to the decision to enrol and may help to explain differences in enrolment among the sites and among households within the sites. In particular, attitudes based on economic criteria have a significant impact upon the decision to invest in education. However, attitudes were not found to be responsible for all variation in the probability of enrolment. This indicates that there is a divergence between notional and effective demand for education in rural Ethiopia. Inconsistency between the two may be explained by constraints on schooling. For example, notional demand may be based on the potential returns to schooling if schools are close by and of good quality. If the distance to travel to school is prohibitive or if school quality is low, effective demand will be below notional demand. Notional and effective demand may also diverge if opportunity costs of schooling are high and if savings or credit to pay for schooling is lacking. Finally, if school places are unavailable, effective demand will be prevented from reaching notional demand.

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Appendix 1: Results of the Attitude Survey

Table A1.1
Attitude Questions and Summary of Responses for the HH Head

Statement	Agree (%)	Disagree (%)
1. It is useless to send girls to secondary school since they will marry.	0.30	0.69
2. Girls who have been to school are less polite and obedient.	0.26	0.70
3. Children who go to school are better able to look after their parents.	0.79	0.19
4. Girls who go to school do not learn how to be good wives and mothers.	0.32	0.68
5. It is important for girls to learn how to read and write.	0.95	0.05
6. Children who finish school usually want to leave the village for work.	0.87	0.10
7. Children who go to school have more respect for their elders.	0.79	0.18
8. Boys who go to school are better farmers than boys who do not.	0.47	0.51
9. Children who go to school are less interested in religious teachings.	0.48	0.48
10. I want my son to have more education than myself.	0.99	0.01
11. I want my son to go to school to have a better job.	0.99	0.01
12. I want my son to go to school to have more status.	0.99	0.01
13. I want my daughter to have more education than myself.	0.99	0.01
14. I want my daughter to go to school to have a better job.	0.99	0.01
15. I want my daughter to go to school to have more status.	0.99	0.01
16. Someone has a young son who does not enjoy school and wants to quit. What should he/she do?		
Let him quit: 0.29 Finish primary: 0.10 Finish junior: 0.07 Finish senior: 0.50		
17. Someone has a daughter who does not enjoy school and wants to quit. What should he/she do?		
Let her quit: 0.34 Finish primary: 0.11 Finish junior: 0.10 Finish senior: 0.41		
18. Someone wishes to go to secondary school but there is not one nearby. What should he/she do?		
Go to work instead of to school: 0.09 Go to a town with a secondary school: 0.90		

Note: Numbers do not add to 100% owing to responses of 'other' or 'no opinion'. Responses considered unambiguously favourable to schooling have been highlighted. However, interpretation of the orientation of results for statement 6 requires information about the respondents' views on migration out of the village. Similarly, to interpret responses to 9 as either pro- or anti-education requires knowledge of a respondent's views on religion.

Appendix 2: Reliability of Attitude Index Scores as a Measure of Attitudes

Full Index

Following Vella, bivariate correlation coefficients were calculated between the raw index and each question. Next, each question was removed from the index in turn and the correlation between the new, smaller index and the omitted question was calculated. Spearman's rho rank order correlation method was used to compensate for the non-normality of the distributions of responses to the categorical agree/disagree questions. Both sets of correlation coefficients are presented in Table A2.1.

Table A2.1
Spearman Rank Order Correlation Coefficients
Attitude Index v. Individual Attitude Questions

Question (abbreviated)	Index	Index -Q
1. Girls don't need schooling, since they will get married.	0.291**	0.154**
2. Girls with schooling are less polite and obedient.	0.306**	0.169**
3. Children with schooling can better look after parents.	0.231**	0.108**
4. Girls with schooling do not become good wives, mothers.	0.278**	0.127**
5. It is important for girls to learn to read and write.	0.093*	0.029
7. Children with schooling have more respect for elders.	0.227**	0.102*
8. Boys with schooling are better farmers.	0.227**	0.062
10. I want my son to have more education than I do.	0.039	0.002
11. I want my son to have a better job.	0.048	0.028
12. I want my son to have more status.	0.101**	0.079*
13. I want my daughter to have more education than I do.	0.180**	0.150**
14. I want my daughter to have a better job.	0.147**	0.124**
15. I want my daughter to have more status.	0.159**	0.129**
16. Boy wants to quit school. Should he?	0.804**	0.600**
17. Girls wants to quit school. Should she?	0.874**	0.713**
18. No secondary school nearby. Quit school or move?	0.374**	0.300**

Note: * = significant at the 0.05 level on a one tailed t-test; ** = significant at the 0.01 level.

All questions are significantly correlated with the full index at the 0.01 level on one-tailed tests, except questions 5 and 12, which are significant at the 0.05 level, and questions 10-11, which are not significantly correlated with the index at all. The small correlation coefficients on these variables may be attributed to the fact that almost everyone agreed with each of these statements, meaning that while they may contribute importantly to the index, they do not vary enough to be correlated strongly with the more erratic index. Questions 16 and 17 are much more highly correlated with the index than the other variables, in part because they allow

higher scores for more positive responses, but also because they are among the best indicators of positive attitudes to schooling.

Subtracting each question from the index in turn and computing Spearman's rho for the new index and omitted variable considerably reduces the correlation coefficients. However, most variables maintain their original significance level. The exceptions are questions 5 and 8, which are not significant at all, and question 7, which is now significant only at the five percent level. Questions 10-11 continue to be insignificantly correlated with the index.

The lack of significance of questions 5, 10 and 11 is unsurprising for the reason stated above. The lower significance of question 7 may be understandable in that increased respect for elders is likely to be of lesser concern to respondents than some of the other, more economic, questions in the index. Each of these questions is significantly correlated with several of the other questions which make up the index.

The lack of significance of question 8 when it is removed from the index is more disturbing. It is significantly correlated with only two of the other attitude questions, and in one case the correlation is negative. It seems appropriate to remove this question from the index. Instead, it may be used on its own as a dummy variable representing the belief that there are benefits from schooling in terms of agricultural productivity. This may prove useful in the equations explaining attitude formation and the probability of enrolment, presented later in the paper.

Sub-Indexes

Further support for use of the attitude index as a measure of attitudes to schooling is that each of the sub-indexes is significantly correlated with the full index at the 0.01 level using Pearson correlation coefficient calculations, whether or not it is included in the index. The sub-indexes were constructed by grouping questions which represent a particular aspect of attitudes towards schooling. The fact that the index as a whole appears to represent both the social and economic components, as well as those relating specifically to girls' schooling, suggests that it is both comprehensive and sufficiently general to be used as a measure of attitudes.

Another way to examine whether the index adequately captures attitudes toward schooling is to check for the consistency of responses. Since the questions consider various aspects of attitudes towards schooling, some inconsistency in responses is expected. However, most respondents ought to be fairly consistently positive or negative in their reactions to statements pertaining to economic aspects or social aspects or those on girls' schooling, in particular. The consistency of answers to each pair of questions in the economic and social sub-indexes was checked for all respondents who answered both questions (see Tables A2.2 and A2.3).

The percentage of inconsistent responses recorded ranges from 3 percent to 52 percent for the economic sub-index. (If question 8 is omitted, this falls to 3 to 29 percent.) On the social sub-index, the range is from 3 to 50 percent. (If question 9 is omitted, the upper bound is reduced to 40 percent of respondents.) For the pairs of questions pertaining to girls' education, from 29 to 33 percent of responses were inconsistent. Overall, respondents were inconsistent on roughly 35 percent of paired questions.

Table A2.2
Percentage of Inconsistent Responses on the Economic Sub-Index

	Q1	Q3	Q8	Q11	Q14
Q1	0.00	0.36	0.51	0.29	0.29
Q3	0.36	0.00	0.52	0.22	0.22
Q8	0.51	0.52	0.00	0.52	0.52
Q11	0.29	0.22	0.52	0.00	0.03
Q14	0.29	0.22	0.52	0.03	0.00

Note: Question pairs pertaining to girls' schooling in particular are highlighted.

Table A2.3
Percentage of Inconsistent Responses on the Social Sub-Index

	Q2	Q4	Q7	Q9	Q12	Q15
Q2	0.00	0.32	0.37	0.45	0.20	0.30
Q4	0.32	0.00	0.40	0.44	0.33	0.33
Q7	0.37	0.40	0.00	0.49	0.23	0.24
Q9	0.45	0.44	0.49	0.00	0.50	0.49
Q12	0.29	0.33	0.23	0.50	0.00	0.03
Q15	0.30	0.33	0.24	0.49	0.03	0.00

Note: Question pairs pertaining to girls' schooling in particular are highlighted.

Approximately one-quarter of respondents were 100 percent consistent in their answers on all pairs of questions in each of the economic and social sub-indexes. Another quarter of respondents were inconsistent in more than half of the pairs of questions answered from the economic sub-index, while more than 40 percent of respondents were inconsistent at least half of the time on the social sub-index statement pairs. Under 30 percent of respondents were inconsistent on the economic sub-index of questions on girls' schooling, but over 46 percent of respondents were inconsistent on the social sub-index pertaining to girls' schooling. The greater consistency of responses on the economic questions is understandable, given the broader range of issues around social aspects of schooling. In general, considering the differing nature of the questions within each sub-index, these seem to be fairly reasonable rates of consistency.

Attitude Indexes as Predictors of Behaviour

If the attitude index does provide a good indication of respondents' attitudes toward schooling, there should be some correlation between their attitude score and behaviour. That is, parents with more positive measured attitudes toward schooling are expected to send a greater proportion of their school-aged children to school, *ceteris paribus*. Among the subset of households with at least one school-aged child, gross enrolment ratios were calculated and each household classified according to whether they had none of their school-aged children currently enrolled (GER=0), some enrolled (0<GER<100), or all enrolled (GER=100).¹¹

Table A2.4
Mean Attitude Index Scores
by Household Gross Enrolment Category

	All	Some	None
Full Index	16.47 (2.75)	15.75 (3.23)	14.22 (3.22)
Economic	4.22 (0.75)	4.00 (0.77)	3.82 (0.87)
Economic/Girls	1.80 (0.44)	1.72 (0.46)	1.65 (0.50)
Social	4.69 (1.07)	4.69 (1.12)	4.63 (1.00)
Social/Girls	2.35 (0.75)	2.39 (0.77)	2.38 (0.72)
Number of HHs.	63	93	131

Note: standard deviations are given in parentheses.

Just over 87 percent of the 341 households surveyed have at least one child of school-going age (7-18 years). Of these 297 households, 46 percent had none of their children currently enrolled in school at the time of the first round of the Ethiopia Rural Household Survey, 32 percent of the households were currently sending some, but not all, of their school-aged children to school, and 22 percent had all of their school-aged children enrolled in school.

The mean age of the household heads is similar for the three groups (none, 46; some, 51; all, 49), thus no systematic difference in attitudes owing to age differences is anticipated. Mean

¹¹ The percentage of children of school-going age who were enrolled was calculated as the number of children currently enrolled in school during the first round divided by the number of school-aged children in the household. Since some of the children who were enrolled were older or younger than school-going age, percentages of greater than 100 were observed for some households. These were counted in the category of households who send all of their school-aged children to school. This method is equivalent to examining gross enrolment ratios, rather than net enrolment ratios. The truth may be somewhat obscured. It is possible that some of a households' school-aged children are not in school but the enrolment of older children makes it appear as if they are. The household's demand for schooling is still clearly indicated by this method, but it obscures the preference for educating older versus younger children. Also, it may be the case that households without school-aged children are not without children in school. This information is concealed.

consumption per adult equivalent is the same for the households where none and some of the children are currently in school (108 Birr) and somewhat higher on average in the households which send all of their children to school (121 Birr). If significant, this income difference might tend to reinforce the likelihood that household heads in this latter group would have positive attitudes toward education.

Not surprisingly, household heads who had none of their children currently enrolled were least likely to express positive opinions regarding education. Very often, the group most likely to have positive attitudes were the household heads with all of their children enrolled. The group of household heads who were sending some, but not all, of their children to school tended to fall in the middle.

It was on the ‘imaginary situation’ questions where this pattern was strongest. When asked to advise a young boy who did not enjoy school and wanted to quit, only 36 percent of the group with none of their children in school suggested that he stay to finish secondary school, whereas 56 percent of the household heads with some of their children in school and 65 percent of the household heads with all of their children in school would have tried to convince the boy to stay in school as long as possible.

Mean attitude scores for household heads and spouses on the main index and each of the sub-indexes are reported by household gross enrolment ratio in Table A2.4. The pattern described holds for the full index and the economic sub-indexes, but is not quite maintained for the social sub-indexes.

ERHS Mini-Attitude Index

A final piece of evidence supporting the contention that attitudes to schooling are adequately captured in the index comes from the Ethiopia Rural Household Survey. Several attitude questions (different from the ones used here) were asked to the same household heads and spouses approximately six months prior to the Education Sub-Sample Survey. Positive responses were summed to create an alternative mini-index of attitudes.

When question 8 is removed from the education sub-sample index created earlier, it is significantly correlated at the 0.05 level with the main survey’s smaller index on Spearman’s rho correlation criterion. This suggests that the respondents were fairly consistent in their views over the months between the two surveys and that the indexes capture attitudes toward schooling reasonably well. Given the weight of evidence against the inclusion of question 8 in the attitude index, this question will be omitted from the index in the analyses which follow.

Appendix 3: Variable Definitions and Mean Values

Table A3.1
Variable Definitions and Mean Values
The Determinants of Attitudes Toward Schooling

Variable Name	Definition	Mean
<i>Dependent Variable:</i>		
ATTITUDE	Score on index of attitudes to schooling	14.77
<i>Individual Variables:</i>		
AGE_YRS	Age in years	40.10
AGE_YRS2	Age squared	1841.35
FEMALE	Dummy: 1 if female	0.48
FEM_HEAD	Dummy: 1 if female and hh head	0.07
MARRIED	Dummy: 1 if married	0.79
EDU_FORM	Dummy: 1 if attended formal school	0.33
EDU_NONF	Dummy: 1 if attended non-formal school	0.07
EDFORMYR	Years of formal schooling	2.05
EDREPEAT	Dummy: 1 if repeated a year of school	0.10
EDREPTYR	Years of schooling repeated	0.17
COGNITIVE	Total cognitive skills score (0-17)	4.43
RAV_FULL	Raven's test score with missing values imputed	18.69
FATH_ED	Dummy: 1 if father has any education	0.08
MOTH_ED	Dummy: 1 if mother has any education	0.02
BEN_EMP	Dummy: 1 if schooling seen to get employment	0.99
BEN_AGR	Dummy: 1 if schooling seen to improve farming	0.48
QUAL_0	Dummy: 1 if school quality rating equals 0	0.20
QUAL_1	Dummy: 1 if school quality rating equals 1	0.04
QUAL_2	Dummy: 1 if school quality rating equals 2	0.08
QUAL_3	Dummy: 1 if school quality rating equals 3	0.06
QUAL_4	Dummy: 1 if school quality rating equals 4	0.25
QUAL_MIS	Dummy: 1 if missing school quality rating	0.37
<i>Household Variables:</i>		
KID	Dummy: 1 if have a school-aged child	0.89
N_KIDS	Number of school-aged children	2.70
HH_SIZE	Number of household members in total	7.53
CONSAE	Consumption per adult equivalent (Birr)	116.12
COST_SCH	Average school fee as percentage of CONSAE	0.16
LAND_PC	Land per household member (hectares)	0.13
REL_MUSL	Dummy: 1 if Muslim	0.18
REL_ORTH	Dummy: 1 if Orthodox Christian	0.44
REL_XIAN	Dummy: 1 if other Christian religion	0.38
<i>Site Variables:</i>		
SITE A	Dummy: 1 if household in site A	0.24
SITE B	Dummy: 1 if household in site B	0.34
SITE C	Dummy: 1 if household in site C	0.20
SITE D	Dummy: 1 if household in site D	0.22

Note: Means are based on the 487 observations used in the econometric analysis. An exception is BEN_AGR for which there are 484 relevant observations. There are 633 observations in total.

Table A3.2
Variable Definitions and Mean Values
The Determinants of Enrolment

Variable Name	Definition	Mean
<i>Dependent Variable</i>		
ENROLLED	Dummy: 1 if currently enrolled	0.35
<i>Individual CHILD Variables:</i>		
AGE_YRS	Age in years	12.21
FEMALE	Dummy: 1 if female	0.46
CHILD_HEAD	Dummy: 1 if child of household head	0.83
BIRTH_ORDER	Sibling order: Oldest = 1, ..., youngest = n	2.44
LIVE_PARENTS	Dummy: 1 if parents plan to live with child later	0.18
<i>Parental Variables</i>		
LIK_ATT_SCH_H	Score on likert attitude index - Head	12.36
LIK_ATT_SCH_S	Score on likert attitude index - Spouse	11.65
LIK_ATT_EC_H	Score on likert attitude index - economic - head	3.00
LIK_ATT_EC_S	Score on likert attitude index - economic - spouse	2.74
LIK_ATT_SOC_H	Score on likert attitude index - social - head	3.40
LIK_ATT_SOC_S	Score on likert attitude index - social - spouse	3.22
MODAGR_H	Dummy: 1 if head not traditional in farming	0.53
BENEFIT_AGR_H	Dummy: 1 if schooling make better farmer - head	0.59
COGNITIVE_H	Total cognitive skills score (0-17) - Head	4.27
COGNITIVE_S	Total cognitive skills score (0-17) - Spouse	1.62
RAVEN_H	Score on Raven's test (5-36) - Head	19.09
RAVEN_S	Score on Raven's test (5-36) - Spouse	18.04
EDUC_H	Dummy: 1 if head has any education	0.33
EDUC_S	Dummy: 1 if spouse has any education	0.23
QUALITY_0_H	Dummy: 1 if school quality rating equals 0 - Head	0.24
QUALITY_1_H	Dummy: 1 if school quality rating equals 1 - Head	0.05
QUALITY_2_H	Dummy: 1 if school quality rating equals 2 - Head	0.07
QUALITY_3_H	Dummy: 1 if school quality rating equals 3 - Head	0.05
QUALITY_4_H	Dummy: 1 if school quality rating equals 4 - Head	0.29
QUALITY_MISS_H	Dummy: 1 if missing school quality rating - Head	0.30
<i>Household Variables:</i>		
NUM_LT7	Number of children aged under 7	1.68
NUM_GT59	Number of adults aged over 59	0.28
CONSAE	Consumption per adult equivalent (Birr)	97.07
FEMALE*CONSAE	Interaction term: sex and income (female*consae)	44.85
HH_COST	School fees as a percentage of consae	0.21
LAND_PA	Land per adult household member (hectares)	0.28
REL_MUSL	Dummy: 1 if Muslim	0.21
REL_ORTH	Dummy: 1 if Orthodox Christian	0.36
REL_XIAN	Dummy: 1 if other Christian religion	0.43
<i>Site Variables:</i>		
SITE A	Dummy: 1 if household in site A	0.17
SITE B	Dummy: 1 if household in site B	0.36
SITE C	Dummy: 1 if household in site C	0.20
SITE D	Dummy: 1 if household in site D	0.27

Note: Means are based on the 387 observations (out of 851) used in the econometric analysis.