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ABSTRACT

A Rand study develops a model concerning mothers in Peninsular Malaysia's three major ethnic groups (Malay, Chinese, Indian), investigating relationships between their early life experiences and their expectations for education levels of their children. The model examines three of the women's early life experiences that are governed by their parents' desires and characteristics: education, early labor force experience, and age at family formation (marriage or first birth). Data are from mothers of 1,159 children, aged 5-9, from the 1976-77 Malaysian Family Life Survey. Results indicate that relationships among mothers' early life experiences and between those outcomes and expectations for children's education often differ by ethnicity and by child's sex. Modern-sector work experience substantially increases mothers' expectations among Chinese and Indian women, but not among Malays, many of whom are from rural areas. Chinese mothers (but not Malays or Indians) strongly favor sons over daughters in expected schooling, but modern-sector work experience changes this pattern, dramatically increasing Chinese expectations for daughters' schooling, but not affecting expectations for sons' attainments. Government policies to improve Malays' social and economic standing have apparently raised expectations for their children's education, relative to Chinese and Indian expectations, as Chinese and Indian women expect their children to complete less schooling than Malays expect. (MH)

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PREFACE

This Note was prepared with the support of The Rand Corporation's Family in Economic Development Center, which is funded through Grant No. OTR-G-1822 from the U.S. Agency for International Development. The purpose of the Center is to provide effective policy research through the integration of technical research with the training of, and collaboration with, Third World scholars and government officials. The research emphasizes the role of human resources in the process of economic development and individual and family responses to programs and policies for promoting growth and development.

The research presented here is drawn from a larger Rand study of family life in Malaysia. It should be of interest to analysts concerned with social and economic processes that govern behavior in developing societies and to policymakers responsible for improving educational attainment in Malaysia and elsewhere.

This Note develops a model of relationships between a mother's early life experiences and her expectations for the education levels of her children. We apply the model to data from Peninsular Malaysia to illustrate how parents develop attitudes toward and preferences for characteristics of their children, and how key experiences alter these preferences. Our results provide the basis for a fuller understanding of both the process of socioeconomic development and the intergenerational transmission of important social and economic characteristics.

The model developed in Sec. II draws from a more general model of linkages between generations in which parent characteristics--their income, fertility, schooling, labor force experiences, and so on--influence both the early outcomes of their children and their children's tastes and preferences. The model estimated in this Note examines three experiences in a woman's early life that are governed by her parents' desires and characteristics and that are postulated in the literature to influence her tastes and preferences: (1) her education, (2) her early labor force experience, and (3) her age at family formation (marriage or first birth). These events, in conjunction with characteristics of her own household, influence her expectations for the amount of education her children will receive.

One of the distinguishing features of this model is that it allows for reciprocity among women's early outcome variables and between one of those variables (age at first birth) and their expectations for their

children's schooling. For example, the amount of education Malaysian women actually obtain may affect the amount and nature of their labor force experience before marriage, and this early labor force experience may affect women's expected or actual education; an early marriage and first birth may lower the probability that a woman will work before marriage by shortening the "at risk" period, and parents' desire to have their daughters work before marriage may cause them to delay the age at which daughters marry. Much previous work in this area has estimated models that rule out reciprocity by assumption. Our approach allows us to test for the existence of reciprocity and therefore to judge whether previous efforts have been in error.

Peninsular Malaysia, a rapidly developing country with an ethnically, religiously, and linguistically diverse population, provides an excellent basis for testing models of the type we develop here. The data consist of a sample of 1159 children ages 5 to 9 drawn from the 1976/77 Malaysian Family Life Survey.

The principal dependent variable is expected years of schooling for each child as reported by his or her mother. The model treats mother's education, mother's early labor force experience--whether she worked at all before marriage and whether this work took place in Malaysia's modern employment sector--and mother's age at first birth as endogenous. Mother's age at menarche and whether she had a fetal loss before her first live birth identify the age at first birth equation. Reduced-form equations for mother's early outcomes include her parents' characteristics (referred to as "grandparent characteristics" in the text) as identifying predictors. These reduced-form equations are reported in the appendix; structural equations for the mother's early

outcome variables and children's expected education are presented and discussed.

Relationships among mother's early life experiences and between those early outcomes and her expectations for children's education often differ by ethnicity and by the sex of the child. A mother's schooling level and her early labor force experience do affect her expectations for children's schooling, but the magnitude and significance of these effects differ importantly among Malaysia's Chinese, Malays, and Indians and between sons and daughters. Premarital work experience at any occupation has no effect on mother's expectations for children's schooling for any group. Modern-sector experience substantially increases mother's expectations for Chinese and Indian women but not for Malays. Chinese mothers--although not Malay or Indian--strongly favor sons over daughters in expected schooling; but modern-sector work experience changes this pattern in a fundamental way for Chinese, dramatically increasing expectations for daughter's schooling but not affecting expectations for son's attainments. However, the age at which a mother has her first birth does not influence her expectations for children's schooling regardless of the ethnic group under consideration, so long as other early life experiences are held constant.

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I. INTRODUCTION

This Note analyzes the relationships among key events in women's lives and their effect on women's attitudes in Peninsular Malaysia, a country undergoing rapid transition from traditional to modern systems of stratification. As developing countries industrialize, they move from a system of opportunities based on rural land ownership and inherited wealth to an urban-based system in which status is transmitted through schooling and job characteristics. This process affects daughters as well as sons especially as more and more women accept employment in the formal market sector for one or more spells during their lives. But we know only a little about what factors affect the speed with which families make the transition from the traditional to the modern behaviors. Jones (1981, p. 264), speaking of rising age at marriage in Malaysia, summarizes:

> These trends are manifestations of social changes exceptional in both their speed and pervasiveness, including broadened educational opportunities, especially for girls, the increased urbanization of Malays, increased participation of Malay women in "modern sector" employment, and vast, though not readily measurable, changes in attitudes of both parents and children.

In this Note we develop a model of the development of women's expectations for the eventual educational attainment of their young children in an attempt to explicate the process through which women and their families acquire views that fit with modern opportunity structures. We expect that a woman's own educational attainment, her premarital work experience and its characteristics, and the age at which she forms her family all affect her expectations for her children's

attainment. We examine children's educational attainment because formal schooling is a major mechanism for intergenerational transmission of status in developed societies, because it becomes increasingly important as countries modernize, and because parents exercise enormous influence over their children's behavior in this sphere (see Sewell and Hauser, 1975). We want to understand why some parents decide on additional education for their children and others do not. By analyzing expectations rather than behavior we get as clear a view as possible of parents' preferences unmuddled by the exigencies of their situation.[1]

One can divide the process that determines children's attainments into two parts: First parents decide on what outcomes they prefer for their children and then they make the necessary investments to insure those outcomes. Children's characteristics enter into the process, as do resource constraints faced by the family. This Note looks at the first part of this process in an attempt to isolate those characteristics and experiences of parents that increase their willingness to use "modern" pathways to advancement for their children. Related work explores the second part of the process and analyze behavior rather than preferences (De Tray, forthcoming).

Our model postulates that a mother's expectations about the levels of her children's schooling are influenced by, among other things, her education, her premarital work experience, and her age at own-family formation (traditionally the age at which she marries). Education, especially past the primary level, exposes women to nontraditional ideas

[1] We would prefer a direct measure of intentions here, or a measures of parents' attitudes toward various amounts of schooling for their child. Expectations reflect the parents' belief (see Fishbein and Ajzen, 1975) about their child's ultimate schooling, a composite of their intentions and their subjective assessment of the likelihood that they (and the child) will carry out those intentions.

and increases access to the rewards available through modern opportunity structures, be these employment, a different marriage market, or advancement for children (Mason and Palan, 1981).

The rapid rise in age at marriage now occuring in developing countries and the accompanying increase in age at first birth create opportunities for change in women's roles and attitudes. Ryder (1976, p. 12) states:

> Temporary freedom from procreation is necessary to provide the young woman with the opportunity to enlarge her personal horizon and acquire sources of satisfaction alternative to motherhood. The future of developing societies may be much more bound up with the future of their young women than with that of their young men.

With respect to market employment, in many developing countries young unmarried women provide a large and cheap labor force for industrial development and through this play an increasingly important role in their family's economic strategy. Salaff (1981) finds that in Hong Kong young women's work experiences before marriage exposes them to earning a wage independent of the family, and both places them in and exposes them to nontraditional women's roles. This exposure to modern, education-based opportunity structures may change their attitudes about their children's education. Below we test the reasoning developed by a number of researchers (Jones, 1981; Hirschman, 1982) that modern-sector employment of young women has effects that employment in traditional occupations may not provide precisely because of the unique characteristics of modern-sector employment discussed above.

In the next section we outline a model of intergenerational status transmission that highlights the role of women's expectations for their children's schooling. Section III reviews briefly the cultural context

on which this work is based and Sec. IV describes the data base, characteristics of the working sample, and variable definitions. discuss results in Sec. V and summarize the paper in Sec. VI.

II. CONCEPTUAL MODEL

The model presented in this section follows a family through three generations to illustrate the process we postulate leads young women to formulate expectations for their children's schooling. In developing this model we have paid special attention to the interrelated nature of family behavior and decisionmaking. In the past scholars attempting to estimate structural as opposed to reduced-form models of family behavior have often had difficulty in identifying these structural equations in theoretically acceptable ways (as opposed to identification necessary for statistical estimation). Models of family behavior frequently take so general a form that all variables rightly belong in all estimated equations, which precludes estimating the behavioral consequences of any one endogenous variable on another.

For the most part researchers have solved this identification problem either by estimating what are essentially reduced-form equations, or by "identifying" structural equations through arbitrary and questionable assumptions. As the model described below indicates, one of the variables predicting educational expectations is endogenous, at least potentially, so we must identify at least part of the family's system of behavioral equations. Our model does so by integrating sociological, biomedical, and economic theory in a conceptually defensible fashion.

GENERAL FRAMEWORK

Figure 1 outlines the model from which we draw our estimating equations. Variable definitions are given at the bottom of the figure. Although the general framework from which it derives has broader applications, this model examines only one outcome subsequent to the start of the family formation process--mother's expectations for her children's educational attainment.[1]

The model shown in Fig. 1 involves three generations--parents of the current decisionmaking generation (called grandparents), the current decisionmaking generation (parents), and their children. It begins with a set of predetermined grandparent characteristics that influence three jointly determined early outcomes of the mother--schooling, age at marriage or first birth,[2] and labor force experience before marriage. This interrelatedness stems from two sources. Our model has grandparents deciding on the levels of all three variables, so grandparent tastes, preferences, and resource or income constraints will tie desired levels of these outcomes together. And, an actual outcome in one area may impinge on outcomes in other areas.

[1] Because we are interested primarily in the effects of a woman's own background characteristics, we have chosen to make this model matriarchal in the sense that it considers only mother's desires and outcomes. Our treatment of husband's characteristics as predetermined is based primarily on data rather than conceptual considerations.

[2] The beginning of the family formation process could be indexed by one of several interrelated variables, such as age at engagement, age at first intercourse, age at marriage, age at first birth, or age at first cohabitation. In this work we concentrate on the two that have been most widely used in the literature: Age at marriage and age at first birth. In most societies these two events are highly correlated and both work as indexes of first family formation. The empirical work that follows uses age at first birth to index age at the beginning of family formation because its biological component insures a common meaning across cohort, ethnic, and socioeconomic groups. (See Rindfuss and Hirschman, 1981; and Hirschman and Rindfuss, 1982, for a more extensive discussion of this issue.)

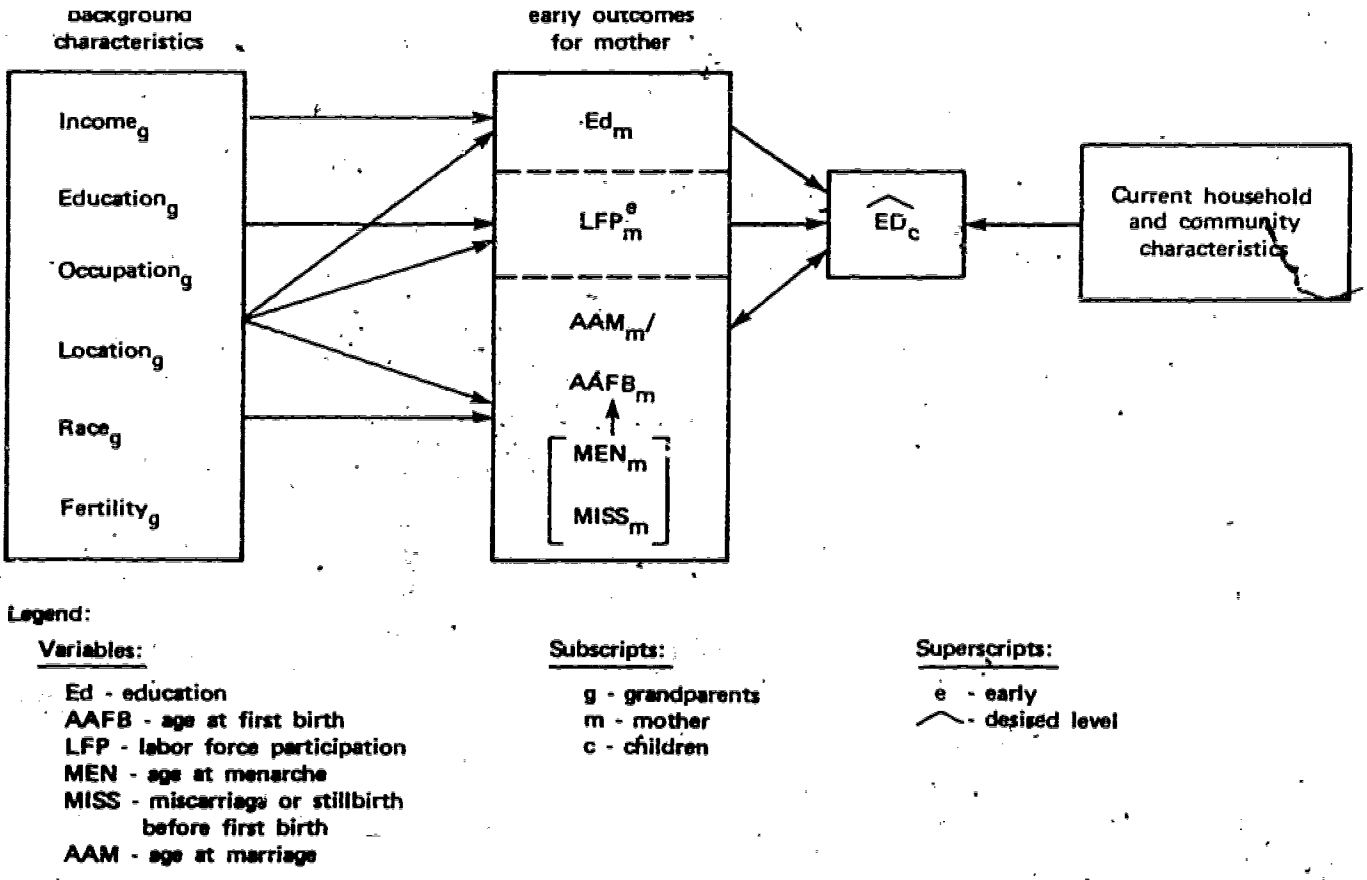

Fig. 1 — A model of intergenerational family behavior

Researchers often overlook the fact that outcomes occurring at very different times--for example, schooling, which ends for most Malaysian women in their early teens, and first births, which take place on average four or more years later--can be jointly determined. Our focus on the role that parents play in influencing their children's early outcomes makes these potential links clear. Ignoring them could result in a seriously misspecified model.

With respect to the interplay among actual outcomes theoretical arguments and empirical evidence in the literature convincingly establish that early labor force experience and age at family formation might be reciprocally related (see Presser, 1971). Most obviously, a delay in age at marriage or first birth gives a woman additional time in which to work before that event and thereby increases the chances that she does so. In Malaysia, parents may deliberately postpone their daughter's marriage so that she can provide labor and wages to the family. Chinese running family businesses appear to use this strategy (Salaff, 1981). Alternatively, families with little need for their daughter's services may accede more readily to her early marriage. And, parents may delay the marriage of their daughters who have decent job opportunities to allow them time to accumulate a dowry through their earnings. In a study of Korea, Sri Lanka, Indonesia, Taiwan, and Malaysia, Hirschman (1982) found that premarital work in modern occupations significantly delayed marriage for women, although it had no additional effect on their age at first birth.[3] These examples point

[3] We argue later that a correct specification of this relationship allows labor force experience and age at marriage to affect each other. For this reason we must treat Hirschman's results as interesting and suggestive but unconfirmed.

out the possibilities for reciprocal relationships between a young woman's early labor force experience and the age at which she forms her own family. They lead us to expect a positive relationship between age at family formation and early labor force experience.

Plausible arguments can also be made linking parents' educational attainment and early labor force participation through grandparent tastes and decisionmaking. However, since our data and theory do not permit us to identify the effect of either of these variables on the other, there is little point is setting them out in detail.

A young woman's education and the age at which she enters a family of procreation may also affect each other in developing countries. Researchers working in the U.S. have examined potential reciprocal effects for women (Marini, 1978; Rindfuss, Bumpass, and St. John, 1980) and have reached conflicting conclusions. There is a relationship between education and age at first birth in developing countries. In a study of eight Asian societies Rindfuss et al., (1983) find consistently strong effects of education on age at first birth, especially for education past primary school. Education increases earnings potential and thereby raises the opportunity cost of domestic activities for women and their families. In addition, education probably has important effects on attitudes, tastes, and aspirations (Cochrane, 1979; Hirschman, 1982), which affect the age at which women and their families think it appropriate for them to marry and begin childbearing.

In a developing country with low average levels of educational attainment, an early marriage or first birth seems unlikely to curtail schooling directly for most women. But, as we argue above, because both

age at marriage and educational attainment depend on parents' preferences and resources, they may be reciprocally related. But the model's statistical estimation does not depend on acceptance or rejection of arguments relating age at first birth and education. So long as we allow reciprocity between age at first birth and early labor force participation, and between early labor force participation and education, all three variables must be treated as endogenous.[4] Thus, we can proceed to the estimation while leaving this theoretical issue unresolved.

With existing data and theory we can identify statistically only one of the three endogenous early outcome measures--age at first birth. As Fig. 1 indicates, the biological phases through which women pass as they mature and such unanticipated fertility events as fetal loss directly affect age at first birth but not mothers' early labor force experience or education.[5]

Fetal losses (miscarriages and stillbirths) affect age at first birth in a direct and obvious manner: It takes time to conceive again and carry the conception to term. Menarche's effect on age at first birth is not as direct, but its established influence is just as strong. Menarche marks the beginning of a woman's fertile years and of her physical transformation from a girl into a woman. In Malaysia as elsewhere (Hillman, Slater, and Nelson, 1970), when a girl reaches menarche she takes an important step on the road to adulthood. Menarche

[4] This statement assumes, as we argue below, that age at first birth and expectations for children's school attainment are also reciprocally related.

[5] Both fetal loss and age at menarche may depend in part on grandparent characteristics because of their link with nutrition. We control for many of these characteristics in our analysis.

acts as a signal to her, to her parents, and to others to begin a period of socialization that results in a mature marriageable woman. Although the nature of this socialization may differ by culture and country, age at menarche remains a strong predictor of age at family formation in most cultures.[6]

As the figure illustrates, we postulate that the age at which a woman has her first birth directly affects her expectations for her children's education and further that her expectations for children's education directly affect her desired (and therefore actual) age at first birth. This reciprocity derives from an assumption that couples make interrelated decisions on the timing of the first birth, desired completed fertility, and characteristics they want their children to have. Economic models of fertility present various of arguments for treating parents' decisions on the number of children they have and their children's characteristics (both innate and acquired) as jointly determined (Schultz, 1974; Becker and Tomes, 1976). Our model provides a natural extension of these arguments to the timing of fertility.

It is important to note that treating age at first birth and school expectations as jointly determined is a hypothesis. It is not an assumption on which the structure of our model or its feasibility of estimating rests. The fact that our age at first birth equation is identified in a statistical sense allows us to explore the relationship between this variable and women's expectations for their children's education without having to assume a priori that we know in which

[6] Udry and Cliquet (1982) find that even in the United States where women marry on average nine years after menarche, age at menarche is a significant correlate of age at marriage. For Malaysia they report a strong zero-order relationship between age at menarche and age at marriage for Malays, and a relationship for Chinese only when education is controlled for.

direction causation flows. If we are wrong in our hypothesis of reciprocity between age at first birth and school expectations, then the main cost is a loss of efficiency in estimating the model. If, however, we assume no reciprocity when it in fact exists we risk seriously misspecifying the model.

SPECIFIC EMPHASIS

In this Note we are concerned only with those structural equations that bear on a woman's expectations for her children's education and her age at first birth. Our main goal is to estimate the following equation:

$$Ed_c = f(Ch, H, Com : Ed_m, LFP_m, AAFB_m)$$

where exogenous variables are listed before the ":", endogenous variables after. In this equation, "Ch" consists of characteristics of the child (such as sex or age), "H" measures current household characteristics (for example, family income or the husband's education), and "Com" consists of current community characteristics (school availability and whether current residence is in a large urban area). The rest of the variables in the equation are as indicated in the figure.

Although mother's education (Ed_m) and her early labor force experience (LFP_m) are predetermined relative to educational expectations in our theoretical model, they must both be estimated as endogenous to avoid simultaneous-equation bias. This is true even though no direct reciprocal link exists between educational expectations and either mother's education or her early labor force activities. The model's

interrelatedness implies that error terms in the mother's education and early labor force participation equations may be correlated with the error term for the educational expectations equation. Thus to obtain consistent estimates of behavioral coefficients, instrumental variable estimates of mother's education and her early labor force experience must be obtained. The two-stage-least-squares technique we use provides such estimates.[7]

As we indicate above, in addition to an equation estimating expectations for children's schooling, we are also able to estimate the following equations related to the jointly determined early outcomes:

$$ED_m = f(GP : AAFB_m)$$

$$LFP_m = f(GP : AAFB_m)$$

where GP represents grandparent characteristics as outlined in Fig. 1. These equations provide a test of the relationship between age at first birth and mother's education, and early labor force participation. They give us added information on the validity of our approach.[8]

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[7] If we assumed that age at first birth affected school expectations but not vice versa then our model would be block recursive. In this event all mothers' early characteristics--education, work experience, and age at first birth--could be treated as predetermined and the children's expectations equation estimated using ordinary least squares. However, so long as one early characteristic--in our case age at first birth--is influenced by expected education, then all must be treated as endogenous to achieve consistent parameter estimates.

[8] Because we do not have restrictions that identify either mother's education or early labor force experience, we cannot include them directly in these equations. We can, however, control for them by including in these equations the instruments that determine them (grandparent characteristics).

III. PENINSULAR MALAYSIA

Malaysia is an extraordinarily rich setting for social science research. In this section we give a brief overview of its cultural and economic characteristics so that the results we present in the following section can be put in their proper perspective.

Peninsular Malaysia is a rapidly developing country with an economy still heavily dependent on traditional agriculture and an ethnically, religiously, and linguistically diverse population. Among nonindustrialized countries, Malaysia stands out as one of the most economically successful, with high rates of growth in per capita income and real GNP from 1961 to 1976 combined with high rates of saving, increased education, and investment in both agricultural and industrial production (Smith, 1981). Despite this record, the population remains quite poor by standards of industrialized countries, and half of the labor force works in agriculture, predominantly in rubber and rice (Young, Brussink and Hasan, 1980; Smith, 1981).

Malaysia has experienced rapid social and demographic change during the last several decades, along with its economic advancement. Age at marriage has risen dramatically for women, more slowly for men (Jones, 1981), fertility and infant mortality have fallen, and contraceptive use has increased (Hirschman, 1980; DaVanzo and Haaga, 1981). Malaysia has become increasingly urbanized, although most of the population still lives in rural areas (Hirschman, 1980). Literacy and educational attainment have risen substantially for all segments of the Malay population (Hirschman, 1975; De Tray, forthcoming).

The country comprises three main ethnic groups, which divide into smaller communities. A bare majority of the population consists of Malays who are found mainly in rural areas and typically farm smallholdings of rice or rubber, or work as fishermen. As a group they have historically had the lowest average education and income levels, marry at the youngest ages of the three main ethnic groups, and have the highest fertility rates, the lowest rates of contraceptive usage, and the highest divorce rates (Jones, 1981; Hirschman, 1980; DaVanzo and Haaga, 1982). In contrast to their disadvantaged economic position, Malays have substantial political power.

Chinese constitute the next largest ethnic community in Malaysia, making up about 36 percent of the population, and Indians third at about 10 percent. Malaysia's Chinese concentrate in trade and commerce, are more urban, more educated, and have higher income levels, on average, than the other two ethnic groups. They marry at the oldest ages, have the lowest fertility and infant mortality rates, and the highest rates of contraceptive use of the three main ethnic groups.

Most Malaysian Indians are either workers on rural agricultural estates, who have very low levels of education, literacy, and income or urban, highly educated civil servants, the vestiges of the Indian clerks brought into Malaysia by the British colonial government to work in administration offices (Arasaratnam, 1970). Indians tend to fall between Malays and Chinese on most demographic measures--age at marriage, fertility, contraceptive use, and urbanization--but have the highest infant mortality rates (Hirschman, 1980).

Several observers have suggested that cultural differences in goals and world view also separate the ethnic groups in Malaysia. Traditionally Malays highly value getting along with others, whereas Chinese value contributing to the prestige and success of the patrilineal family, with social rewards accruing to those who show skill at accumulating wealth and competing successfully (Henderson, 1970). These and other deep-seated differences in cultural norms and values are likely to be reflected in relationships between mothers' characteristics and their expectations for children's schooling.

IV. DATA, SAMPLE, AND VARIABLE DEFINITIONS

THE MALAYSIAN FAMILY LIFE SURVEY

The 1976-77 Malaysian Family Life Survey (MFLS) sampled private households in Peninsular Malaysia that contained at least one ever-married woman (EMW) aged under 50 at the time of the initial visit (Butz and DaVanzo, 1978). The survey consisted of three rounds, four months apart. Eleven questionnaires were administered once or several times throughout the survey. A total of 1062 households completed round 1 of the survey; 96 percent of first-round cases remained at the end of the third and final round.

Several recent checks of the quality of the MFLS data show it to be quite high. Haaga (1981) examined the MFLS data on the number and timing of births to respondents, searching for patterns of bias in reporting of data of births and comparing responses on the MFLS and Malaysian vital statistics. The cohort birth and infant death rates implied in the MFLS reports are quite close to vital statistics. In addition, Haaga's checks of information on educational attainment, housing quality, and contraceptive use all show the MFLS to match other sources quite well.

SAMPLE AND VARIABLE DEFINITIONS

Regressions reported in the next section were estimated on a sample of 1159 children aged 5 to 9 years whose mothers were ever-married respondents in the MFLS.[1] Mothers' expectations about their children's

[1] Of the children in our sample 87 percent had no or only one sibling aged 5-9 also in the sample. For this reason, we choose to ignore statistical problems associated with correlations among error terms for sample observations drawn from the same family environment.

ultimate educational attainment were asked only for children five years old or older. By age 10 Malaysian children begin to leave school permanently so we use age 9 as an upper bound on the ages of the children we consider.[2] Furthermore, by age 10 and beyond mothers begin to obtain a large amount of information on the schooling performance and study habits of the child. Limiting the sample to children aged 5-9 minimizes the extent to which such information contaminates the mother's expectations for the schooling of her child.

The empirical counterparts to the conceptual variables discussed above are mostly self-explanatory. Below we briefly discuss those that are not. Appendix Table A.1 gives means and standard reservations. Unless otherwise stated variables are categorical, taking on a value of 1 for the indicated category, zero otherwise.

Two variables measure early labor force participation.[3] "Anywork" equals 1 if the woman worked at a job in any occupation for at least a year before her first live birth, 0 otherwise. We include here workers in family businesses and those selling home products and services. "Modernwork" equals 1 if the woman worked for at least a year before her first birth in an occupation in the modern sector of the economy. The modern sector includes paid employees (full or part time) and the self employed or employers who were also in the following occupations: Professionals, technical workers, administrative and managerial workers,

[2] Only 1 percent of the children in our sample of 5-9 year old children had either never been to school or attended school in the past but did not attend during the year of the survey. Mothers reporting educational expectations for children who have completed their schooling are not considered in this sample.

[3] The MFLS contains information on all labor force experience since age 15 or first marriage, whichever came first.

clerical or sales workers, service workers, laborers outside of agriculture, production workers, and operators. Agricultural workers and unpaid family workers are not considered to be in the modern sector.

We must elaborate briefly on the reasons for our choice of this coding for premarital work experience. Earlier we argued that we expect work experience before marriage to affect women's expectations for their children's schooling differently for work in the modern sector of the economy than for work only in a traditional setting. The coding of premarital work experience into two dummy variables--one reflecting any job and one reflecting only work in the modern sector--allows us to test our reasoning.[4]

In any coding of women's work in developing countries one must be aware that the concept has a very different meaning than in industrial societies. The distinction for women between never working before marriage and working in the family business or on a farm is subtle, increasing unreliability of reported employment (Hirschman, 1982). (See also Mason and Palan (1981) and Goldstein (1972) for discussions of the measurement of women's work in developing countries.) The coding we use for Anywork includes as workers all women who report a job, whatever its characteristics; this measure makes full use of the information on employment available in the data but depends entirely on the woman's perception of her work status. Modernwork groups together no work with work in traditional occupations, thus eliminating the problem of defining "work" at the boundaries of traditional agriculture.

[4] As an alternative we could have coded our measure into a series of three categories: No work, work in the traditional sector, and work in the modern sector. Our coding allows for simpler computation although it is statistically less efficient.

In developing countries, both level and sources of income may affect educational expectations. We use as our income variable the broadest measure of income developed by Kusnic and DaVanzo (1980). This measure, referred to as Total Actual Income II, includes all income from cash sources, imputed income from own housing, and the value of household services provided in the home (cooking, child care, etc.). This measure more closely reflects families' lifetime wealth positions than does money income alone. Higher incomes should be associated with high expectations for children's schooling, other things equal.

We also allow for the possibility that, holding the level of income constant, the sources of a family's income affects expectations. In addition to total family income, we include a variable measuring (in Malaysian dollars) income from family-owned businesses and a variable indicating the amount of farm land the household owns. Because the regression specification includes total family income, coefficients on business income and farm land reflect the effect of increasing the household's share of income from those sources. Income from a family business is measured in Malaysian dollars, whereas we measure the amount of farm land in acres. For all measures of income and for farm acreage, we explored various specifications (spline functions, dummy variables) before settling on the linear measures we present. In all cases, these provide as much information as the more complex measures.

We treated problems of missing data in two ways. If information on a dependent or endogenous variable was missing, we excluded that observation from the analysis. There were very few such cases, so sample selection problems should not be serious. When information was

missing for an explanatory or exogenous variable, we set that variable equal to a predetermined missing value code and included a dummy variable coded one to identify observations with that missing variable. Family income was the most frequently missing contemporary variable (about one seventh of the time),[5] grandparent occupational codes the most frequently missing historical variables (about 15 percent of the time).

This is an accepted method for dealing with missing data, but not the most efficient. To check the results we ran a series of comparative regressions in which observations with missing data were excluded from the estimation sample. The results were always qualitatively similar to regressions with missing variable dummies, but, as expected, standard errors were somewhat larger. No interpretation can be placed on the missing variable dummies because their magnitudes depend on the value given the missing observation (for example, when husband's education was missing, we coded that variable "99"). For this reason and to keep the number of results we report to a manageable level, we do not include missing variable coefficients in the regression tables.

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[5] The high frequency of missing values for income results from the fact that the Kusnic-DaVanzo measure we use is the summation of a great many subcomponents. If any major component is missing, the total is also missing.

V. RESULTS

UNDERLYING STRUCTURE

Before turning to the issue of mother's expectations about her children's educational attainment, we examine some of the structure underlying that equation. Tables 1-3 report on the interrelationships between a woman's age at first birth, education, and two measures of her early labor force experience.[1] Their estimation also allows us to explore two additional points: The degree to which our identifying restrictions work empirically and the importance of appropriate estimation techniques.

Each table provides comparisons between ordinary least squares (OLS) and two stage least squares (2SLS) regressions with first the labor force variables and then education as dependent variables.[2] A comparison of results for the two estimation techniques illustrates graphically the dangers of OLS estimation when variables are jointly related. For example, in Tables 1 and 2 OLS estimates of the effect of age at first birth on Modernwork and on Education suggest strong and positive relationships; in both cases 2SLS estimates show weak and

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[1] These equations were also estimated separately with interactions between race and key explanatory variables. Because no interaction was significant, we did not include them in our final specifications.

[2] The labor force variables are measured as a dichotomy. It is well known that dichotomous dependent variables violate the assumptions underlying OLS estimation. However, the effect of violating these assumptions is nontrivial only if the split on the dependent variables is severe, which is not the case for either of our labor force variables. Also, Heckman (1978) shows that OLS instrumental variables are actually preferable to unadjusted probit estimates because OLS errors are orthogonal.

Table 1

OLS AND 2SLS REGRESSIONS OF ANYWORK BEFORE FIRST BIRTH ON AGE AT FIRST BIRTH AND CHARACTERISTICS OF GRANDPARENTS AND MOTHER

Independent Variables(a)	OLS Parameter Estimate	OLS t-ratio	2SLS Parameter Estimate	2SLS Asymptotic t-ratio
Age at first birth(b)	.05	11.5	.08	3.2
Mother's residence at age 15(c)				
Kuala Lumpur	.02	0.3	.01	0.1
Ipoh	-.04	-0.7	-.08	-1.3
Penang	-.17	-3.3	-.18	-3.4
Abroad	-.18	-3.1	-.17	-2.8
Other urban area	.03	0.7	.03	0.7
Grandfather's education (in years)	-.000	-0.1	-.01	-0.9
Grandfather's occupation(d)				
Sales	-.03	-0.5	-.06	-1.1
Miscellaneous	-.11	-2.2	-.12	-2.1
Production	.01	0.2	.00	0.0
Fisherman	-.09	-1.6	-.09	-1.4
Grandmother's education (in years)	-.03	-1.4	-.03	-1.7
Chinese	.04	1.9	.05	2.1
Indian	-.00	-0.1	-.01	-0.2
Grandmother's occupation(d)				
Housewife	-.21	-5.6	-.23	-5.7
Production	-.20	-3.8	-.21	-3.8
Miscellaneous	-.19	-3.8	-.19	-3.6
Mother's age (in years)	-.00	-1.2	-.01	-1.9
Ethnicity(e)				
Chinese	.21	6.1	.11	1.5
Indian	.01	0.2	.04	0.8
Intercept	-.15		-.70	
N	1153		1144	
R^2	.24			

(a) This equation includes variables for grandfather's education and occupation missing and grandmother's education and occupation missing for which we do not report coefficients.
(b) Endogenous in the 2SLS equation.
(c) Rural omitted.
(d) Farmer omitted.
(e) Malay omitted.

Table 2

OLS AND 2SLS REGRESSION OF MODERN WORK BEFORE THE FIRST BIRTH ON AGE AT FIRST BIRTH AND CHARACTERISTICS OF GRANDPARENTS AND MOTHER

	OLS		2SLS	
Independent Variables(a)	Parameter Estimate	t-ratio	Parameter Estimate	Asymptotic t-ratio
Age at first birth(b)	.03	10.6	-.03	-1.2
Mother's residence at age 15(c)				
Kuala Lumpur	-.00	-0.0	.03	0.5
Ipoh	.02	0.5	.11	1.9
Penang	-.05	-1.2	-.01	-0.2
Abroad	-.10	-2.0	-.10	-1.7
Other urban area	.01	0.3	.01	0.3
Grandfather's education (in years)	.01	2.3	.02	3.1
Grandfather's occupation(d)				
Sales	.09	2.1	.15	2.8
Miscellaneous	.08	1.9	.10	2.0
Production	.11	3.3	.11	2.7
Fisherman	.04	0.8	.04	0.7
Grandmother's education (in years)	-.01	-0.4	.00	0.2
Chinese	.03	1.8	.02	0.8
Indian	-.02	-1.0	-.01	-0.4
Grandmother's occupation(d)				
Housewife	.06	1.9	.07	1.9
Production	.14	3.3	.18	3.5
Miscellaneous	.02	0.6	.02	0.3
Mother's age (in years)	-.00	-0.8	.00	1.0
Ethnicity(e)				
Chinese	.08	2.8	.23	3.4
Indian	.06	1.6	.00	0.0
Intercept	-.57		.44	
N	1153		1144	
R^2	.24			

(a) This equation includes variables for grandfather's education and occupation missing and grandmother's education and occupation missing for which we do not report coefficients.

(b) Endogenous in the 2SLS equation.

(c) Rural omitted.

(d) Farmer omitted.

(e) Malay omitted.

Table 3

OLS AND 2SLS REGRESSIONS OF MOTHER'S EDUCATION ON AGE AT FIRST BIRTH AND CHARACTERISTICS OF GRANDPARENTS AND MOTHER

Independent Variables(a)	OLS Parameter Estimate	OLS t-ratio	2SLS Parameter Estimate	2SLS Asymptotic t-ratio
Age at first birth(b)	.24	10.9	-.22	-1.3
Mother's residence at age 15(c)				
Kuala Lumpur	1.29	3.0	1.47	2.9
Ipoh	-1.41	-4.8	-.82	-2.0
Penang	-.33	-1.2	-.12	-0.4
Abroad	.46	1.4	.37	0.9
Other urban area	-.04	-0.2	-.04	-0.2
Grandfather's education (in years)	.25	7.3	.34	6.8
Grandfather's occupation(d)				
Sales	1.06	3.7	1.65	4.3
Miscellaneous	1.38	4.7	1.48	4.3
Production	.23	1.0	.33	1.2
Fisherman	-1.02	-3.1	-1.02	-2.7
Grandmother's education (in years)	.30	2.9	.37	3.0
Chinese	.01	0.1	-.14	-1.0
Indian	-.23	-1.5	-.11	-0.6
Grandmother's occupation(d)				
Housewife	.61	2.9	.78	3.1
Production	.58	1.9	.79	2.2
Miscellaneous	-.29	-1.0	-.38	-1.1
Mother's age (in years)	-.16	-13.3	-.12	-6.6
Ethnicity(e)				
Chinese	-.58	-3.0	.61	1.3
Indian	-.30	-1.2	-.72	-2.2
Intercept	3.02		10.08	
N	1153		1144	
R^2	.39		.28	

(a) This equation includes variables for grandfather's education and occupation missing and grandmother's education and occupation missing for which we do not report coefficients.
(b) Endogenous in the 2SLS equation.
(c) Rural omitted.
(d) Farmer omitted.
(e) Malay omitted.

insignificant relationships. In contrast, the 2SLS estimates of age at first birth's effect on Anywork are actually almost twice as large as OLS estimates.

The 2SLS estimates leave a clear and intuitively appealing picture of household behavior in this area. An unanticipated (exogenous) large age at first birth "causes" more early labor force participation by allowing young women more time to work. In contrast, this later first birth does not increase the chances of work in the modern sector.

The statistically significant effect of age at first birth on Anywork implies that if a young woman postpones motherhood for any reason, norms dictate that she do something useful--i.e., work. A woman who is not in school, not working, and not married (or a mother) can cause embarrassment for her family. As a result, families can encourage her to assume one of the approved roles (e.g., Namboodiri, 1981). The finding that age at first birth has no effect on Modernwork suggests that families may care less what kind of jobs their young women get than they do about whether they work.

As Table 3 shows young Malaysian women do not alter their educational attainment based on the timing of their first birth. This result fits with average levels of education in the country, suggesting that young women typically leave school many years before they marry and begin families. In our sample the women completed about 3 years of formal schooling, on average, and bore their first child at age 20.[3] It suggests also that controlling for other factors, parent tastes,

[3] However, that age at first birth has no effect on educational attainment may not be entirely because the temporal distance between them is so great. When biological variables are used to identify the age at family formation equation (Rindfuss, Bumpass and St. John, 1980), similar results are obtained in the United States, where the temporal distance between the two events is much smaller.

preferences, and resources do not generate a causal relationship from daughter's age at first birth to her completed schooling.

Finally, reduced-form equations presented in Tables A.1-A.4 support the identifying assumptions on which our equation on structural age at first birth rests. Age at first birth is delayed about one third of a year for each year delay in age at menarche, and fetal loss raises age at first birth by one and one-third years. The remaining coefficients in the reduced-form regressions tell a generally sensible story about family life in Malaysia.

EDUCATIONAL EXPECTATIONS

Table 4 presents our analysis of the effects of mother's age at first birth, early labor force experience, and education on her expectations for the ultimate educational attainment of her 5 to 9 year-old children. Because Malaysian society comprises three distinct ethnic groups with widely differing cultural and social characteristics, we first explored the possibility that the relationships of interest depend on ethnicity. We estimated all equations separately for the two largest ethnic groups--Malays and Chinese--to identify coefficients that differed between these groups (our Indian sample contained too few cases to support separate analysis). We then re-estimated the equations combining all ethnic groups but included interactions with ethnicity for coefficients identified as differing for Chinese and Malays. We found that both measures of early labor force participation and education affected educational expectations for children differently for ethnic groups. In addition, the effect of current residence depended on ethnicity, as did child's sex. Table 4 includes these interaction terms.

Table 4

REGRESSION OF MOTHER'S EXPECTATIONS FOR CHILD'S EDUCATIONAL ATTAINMENT ON ENDOGENOUS AGE AT FIRST BIRTH, MOTHER'S EDUCATION, AND ANY WORK (EQUATION 1) AND MODERN WORK (EQUATION 2)

Independent Variables(a)	Anywork Parameter Estimate	Anywork Asymptotic t-ratio	Modernwork Parameter Estimate	Modernwork Asymptotic t-ratio
Endogenous Variables				
Work prior to first birth	-.77	-0.7	.59	0.4
Work X Chinese	.93	0.7	1.72	1.0
Work X Indian	1.89	0.9	6.20	2.3
Age at first birth	-.04	-0.3	-.14	-1.2
Mother's education	.08	0.6	.11	0.8
Mother's education X Chinese	.17	1.7	.07	0.6
Mother's education X Indian	.49	2.8	.28	1.5
Included Exogenous Variables				
Father's education	.23	5.0	.22	4.9
Mother's age (in years)	.05	1.9	.05	2.2
Ethnicity(b)				
Chinese	-3.81	-3.7	-3.23	-6.4
Indian	-3.51	-2.5	-3.35	-4.3
Distance to nearest school				
Primary	.02	0.1	.10	0.7
Secondary	-.06	-1.2	-.05	-1.2
Child's sex (boy =1)	.11	0.5	.10	0.4
Child's sex X Chinese	.76	2.1	.71	1.9
Child's sex X Indian	.59	0.9	.08	0.1
Child's age (in years)	-.07	-1.1	-.06	-0.9
Current residence(c)				
Kuala Lumpur	-.76	-1.2	-.70	-1.1
Ipoh	7.91	2.9	7.37	2.7
Penang	.95	1.2	1.27	1.6
Other Urban Area	.65	1.6	.81	2.1

Table 4 (cont'd)

Independent variables(a)	Anywork Parameter Estimate	Anywork Asymptotic t-ratio	Modernwork Parameter Estimate	Modernwork Asymptotic t-ratio
Current residence X Chinese				
Kuala Lumpur	1.16	1.3	1.14	1.3
Ipoh	-7.38	-2.6	-7.17	-2.6
Pendang	-2.10	-2.1	-2.70	-2.7
Other Urban	-.94	-1.8	-1.17	-2.4
Current residence X Indian				
Kuala Lumpur	-.18	-0.1	1.13	0.9
Ipoh	-7.10	-1.8	-3.84	1.0
Pendang	-.34	-0.2	.10	0.1
Other Urban	-.70	-0.6	.69	0.6
Household income in Malaysian $ (000)	.00	2.8	.00	2.8
Business income in Malaysian $ (000)	-.18	-0.8	-.24	-1.0
Farmland owned by household (in acres)	-.30	-1.3	-.25	-1.0
Intercept	10.57		11.61	
N	1077		1077	

(a) This equation includes variables for father's education missing and missing household and business income for which we do not report coefficients.
(b) Malay omitted.
(c) Rural omitted.

These interaction terms make the table both difficult to read and easily misinterpreted. We have therefore reported all the appropriate partial derivatives and related standard errors in tables throughout the discussion.

Controlling for other factors, our results show no systematic effect of age at first birth on a mother's expectations for her children's schooling. Although in general coefficients are sensitive to method of estimation, this finding holds whether age at first birth is treated as endogenous or exogenous (OLS estimates not reported here confirm this). Because a women's early labor force experience and education are among the equation's "other factors," this finding is not all that surprising, but results for the two remaining factors suggest an interesting story of social change in Malaysia.

We find that whether a woman worked for pay at all before marriage bears no relationship to her expectations for children's education. As Table 5's first line shows, this finding holds for all ethnic groups.

Table 4's second set of columns show that the effect of Modernwork on schooling expectations depends on ethnicity. Line two of Table 5 summarizes these results. Malays show no effect but Chinese and Indian women who worked in the modern sector before their first birth expect considerably more years of education for their child than do Chinese and Indian women who did not have this early labor force experience. In both cases, the effects are substantial: Modernwork raises expected schooling by 2.3 years for Chinese and by 6.8 years for Indians, although the large effect for Indians may partly reflect small sample

Table 5

ETHNIC-SPECIFIC RESULTS

t-statistics in parentheses)

Variable	Malay	Chinese	Indian
Anywork	-.77 (-.7)	.156 (.1)	1.1 (.5)
Modernwork	.59 (.4)	2.3 (1.9)	6.8 (2.7)
Mother's Education	.11 (.8)	.181 (1.5)	.40 (2.0)

size.[4] It may, however, also stem from the division of the Indian population into relatively poor and poorly educated rural estate workers and relatively affluent, well educated urban professionals. Affluent urban Indian women tend to have access to modern sector employment and to have fairly high aspirations--and expectations--for their offspring. However, given the very small number of Indian women in the sample we are reluctant to push this explanation very far.

Table 4 shows that mother's education does not affect expectations for children's schooling for Malays but does have a significant, positive effect for the other two groups.[5] These effects range from about a third to half a year increase in expected education for each year increase in mother's educational attainment.

[4] Our sample included only 20 Indian women who reported premarital work in the modern sector.

[5] In the equation including Modernwork, the coefficient for Chinese mother's education fails to attain significance but is positive, although not sizable.

We find in Table 4 that, controlling for work in the modern sector, Malay and Indian mothers expect about the same education for their sons and daughters, net of other factors. But Chinese mothers favor sons by a substantial amount, expecting about eight-tenths of a year more schooling for male than for female children. This sex differential among Chinese probably stems from cultural and religious traditions of male dominance.

These findings lead us to suspect differences in the effects of mother's early experiences for sons and daughters, especially among Malaysian Chinese. We estimated all equations separately by sex of child to explore this possibility. For simplicity, in Table 6 we present below coefficients for only mother's work and education from the modernwork equations, and discuss results from other equations only in passing.

Table 6

ETHNIC-SPECIFIC RESULTS FOR SONS AND DAUGHTERS

(t-statistics in parentheses)

Variable	Malay	Chinese	Indian
Mother's education:			
Son	.25 (1.4)	.48 (2.9)	.57 (2.2)
Daughter	.22 (1.2)	-.06 (.4)	.35 (1.1)
Modernwork:			
Son	-.24 (-.1)	.71 (.5)	6.28 (2.5)
Daughter	-.25 (-.1)	5.28 (3.0)	8.01 (1.9)

For sons, our results closely parallel the findings for the entire sample; age at first birth has no effect, nor does work before marriage for Chinese or Malays, although work experience greatly increases educational expectations for Indian women's sons. Highly educated Malay women expect no more schooling for sons relative to daughters net of other factors than do those with less education; but not so for Chinese Indian mothers: for these groups higher mother's schooling leads to more expected schooling for male children, both absolutely and relative to female children. Few other factors affect expected schooling; father's education provides an important exception for both sons and daughters.

For daughters, a very different picture emerges. Mother's schooling does not significantly affect expectations for daughter's education for any of the three ethnic groups. Work at any occupation before marriage has no effect for any of the three ethnic groups, and work in the modern sector has an insignificant effect on expected schooling for Malays' daughters. For Chinese and for Indian women, however, experience in modern sector employment produces huge increases in expected schooling for daughters--about five and eight years, respectively--in contrast to no effect for sons among Chinese.

We have reported here only the major findings of this research. In reaching these final regression specifications we explored a number of alternative specifications, the results of which we summarize here: (1) We tested alternative functional forms for age at first birth--natural logarithms, reciprocals and so forth--but none would have altered the conclusions we report here; (2) varying the length of time over which

our labor force variables were defined did not alter our results; and (3) we found no effect for several variables describing the respondents' current community.

VI. SUMMARY AND CONCLUSIONS

In this Note we develop and estimate a model of mothers' expectations for her children's education levels. The model places special emphasis on the relationship between a mother's early characteristics--her education, her labor force experience before marriage, and her age at first birth--and children's educational expectations. It also stresses the interrelatedness of family decisionmaking by allowing for reciprocity between a mother's early characteristics and between some of those characteristics and her expectations about children's schooling.

Our analysis showed that age at first birth is an important determinant of whether a young woman works before marriage, but not of the type of work she does. In discussing the consequences of age at first birth for women's tastes, preferences, and expectations, we and others argue that the relationship is probably not a direct one; rather, later age at first birth provides women with an increased opportunity to experience nontraditional, modernizing roles. These experiences then work to reformulate her attitudes and expectations. We find that age at first birth indeed has no direct effect on educational expectations, which is consistent with our earlier speculations, but also that it has no indirect effect either through work at any occupation or through work in the modern sector. This is so because while age at first birth does increase the probability of working in any occupation, that experience itself has no direct effect on school expectations; and although work in the modern sector before marriage does raise schooling expectations for

Indians and Chinese, the likelihood of that experience does not depend at all on age at first birth.

One interesting finding emerges from an examination of the structural relationships preceding the mother's expectations for her children's educational levels--age at first birth affects whether a woman works before marriage but not the type of work she does. This finding is intuitively appealing, but it does run counter to the common assumption that because the labor force experience is temporally before the first birth it is also causally before. It is quite common in social demography to treat work before marriage or the first birth as exogenous to the fertility process. These findings strongly argue against that approach.

The equations in Table 4 show that neither age at first birth nor work at any occupation before marriage has a direct effect on mother's expectations for children's schooling. Premarital work experience in the modern sector substantially increases mothers' schooling expectations for Chinese and Indian women but not for Malays. We find that Chinese--but not Malay or Indian--mothers strongly favor sons over daughters in expected schooling but that modern-sector work experience appears to change this pattern in a fundamental way for Chinese, dramatically increasing expectations for daughter's schooling but not affecting expectations for son's attainments.

Our results also showed that Chinese, who have historically the highest educational attainment of any Malaysian ethnic group, expect their children to complete considerably less schooling than Malays--over three years less. Indian women, who have very low average levels of education, expect their children to receive less schooling than Malays.

These findings suggest that Malaysian government policies to improve Malays' social and economic standing have raised expectations for their children's education relative to both Chinese and and Indian expectations.[1]

With respect to our initial hypothesis, we find that age at first birth does not contribute to mother's expectations for children's schooling net of other early life experiences. However, her education level and pre-marriage work experience do affect these expectations, with the magnitude and significance of these effects differing importantly among Malaysia's three ethnic groups.

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[1] We cannot tell from these results whether the change in relative socioeconomic status implied by these results and the goal of the Malaysian government policies will succeed in fact as well as in expectations. However, a parallel study on current school enrollment among Malaysian children (De Tray, forthcoming) finds that Malay children attend school more frequently and for more hours than do either Chinese or Indian children. In this instance expectations may accurately herald future social changes.

Appendix

Table A.1

REDUCED FORM EQUATIONS FOR TABLE 4: AGE AT FIRST BIRTH

Independent Variables(a)	Parameter Estimate	t-ratio
Excluded Exogenous Variables		
Age at menarche	.31	5.1
Fetal loss before first birth	1.04	2.4
Mother's residence at age 15(b)		
Kuala Lumpur	-.34	-0.5
Ipoh	1.21	3.0
Penang	.26	.6
Abroad	-.46	-1.0
Other urban area	.03	0.1
Grandfather's education (in years)	.14	3.0
Grandfather's occupation(c)		
Sales	1.11	2.9
Miscellaneous	.06	0.1
Production	.19	0.6
Fisherman	.38	0.8
Grandmother's education (in years)	.13	1.0
Grandmother's occupation(c)		
Housewife	.37	1.3
Production	.35	0.9
Miscellaneous	-.25	-0.6
Included Exogenous Variables		
Father's education	.12	3.9
Mother's age	.09	5.0
Ethnicity(d)		
Chinese	1.51	3.7
Indian	-.75	-1.3

Table A.1 (cont.)

Independent Variables(a)	Parameter Estimate	t-ratio
Distance to nearest school		
Primary	.17	1.1
Secondary	.02	0.3
Child's sex (boy=1)	-.25	-0.9
Child sex X Chinese	.45	1.1
Child sex X Indian	-.01	-0.0
Child's age (in years)	-.27	-3.8
Current residence(b)		
Kuala Lumpur	.27	0.4
Ipoh	-.56	-0.2
Penang	1.35	1.8
Other urban	.01	0.0
Chinese x Kuala Lumpur	1.86	2.0
Chinese x Ipoh	2.75	0.9
Chinese x Penang	-.15	-0.2
Chinese x other urban	.53	1.0
Indian x Kuala Lumpur	1.33	1.1
Indian x Ipoh	2.38	0.5
Indian x Penang	.25	0.2
Indian x other urban	-.55	-0.7
Household income in Malaysian $ (000)	.01	0.8
Business income in Malaysian $	-.11	-0.4
Farmland owned by household (in acres)	-.25	-0.9
Intercept	12.25	
N	1106	
R^2	.32	

(a) This equation includes variables for grandfather's, grandmother's and father's education missing, grandfather's and grandmother's occupation missing, and missing household and business income for which we do not not report coefficients.
(b) Rural omitted.
(c) Farm omitted.
(d) Malay omitted.

Table A.2

REDUCED FORM EQUATIONS FOR TABLE 4: ANYWORK

Independent Variables(a)	Parameter Estimate	t-ratio
Excluded Exogenous Variables		
Age at menarche	.02	2.2
Fetal loss before first birth	.17	2.7
Mother's residence at age 15(b)		
Kuala Lumpur	.13	1.4
Ipoh	.02	0.3
Penang	-.08	-1.2
Abroad	-.21	-3.2
Other urban area	.01	0.3
Grandfather's education (in years)	.02	2.4
Grandfather's occupation(c)		
Sales	.04	0.7
Miscellaneous	-.08	-1.4
Production	.01	0.2
Fisherman	-.06	-0.9
Grandmother's education (in years)	-.02	-1.2
Grandmother's occupation(c)		
Housewife	-.14	-3.4
Production	-.10	-1.8
Miscellaneous	-.15	-2.6
Included Exogenous Variables		
Father's education	-.01	-1.6
Mother's age (in years)	-.001	-0.5
Ethnicity(d)		
Chinese	.30	5.1
Indian	-.02	-0.2

Table A.2 (cont.)

Independent Variables(a)	Parameter Estimate	t-ratio
Distance to nearest school		
Primary	-.01	-0.4
Secondary	.01	1.1
Child's sex (boy=1)	.03	0.8
Chinese	-.03	-0.5
Indian	.13	1.4
Child's age (in years)	-.02	-1.8
Current residence(b)		
Kuala Lumpur	-.02	-0.1
Ipoh	-.25	-0.5
Penang	-.03	-0.3
Other urban	-.15	-2.5
Chinese x Kuala Lumpur	-.11	-0.8
Chinese x Ipoh	-.26	-0.6
Chinese x Penang	-.11	-0.8
Chinese x other urban	.20	2.5
Indian x Kuala Lumpur	-.20	-1.1
Indian x Ipoh	.14	0.2
Indian x Penang	-.34	-1.7
Indian x other urban	-.17	-1.6
Household income in Malaysian $ (000)	.002	1.6
Business income in Malaysian $	-.01	-0.3
Farmland owned by household (in acres)	-.02	-0.5
Intercept	.44	
N	1106	
R^2	.21	

(a) This equation includes variables for grandfather's, grandmother's and father's education missing, grandfather's and grandmother's occupation missing,, and missing household and business income for which we do not not report coefficients.

(b) Rural omitted.

(c) Farm omitted.

(d) Malay omitted.

Table A.3

REDUCED FORM EQUATIONS FOR TABLE 4: MODERNWORK

Independent Variables(a)	Parameter Estimate	t-ratio
Excluded Exogenous Variables		
Age at menarche	.001	0.2
Fetal loss before first birth	-.06	-1.2
Mother's residence at age 15(b)		
Kuala Lumpur	.01	0.2
Ipoh	.09	2.0
Penang	-.03	-0.6
Abroad	-.10	-1.9
Other urban area	-.001	-0.0
Grandfather's education (in years)	.01	2.5
Grandfather's occupation(c)		
Sales	.09	2.1
Miscellaneous	.06	1.4
Production	.08	2.2
Fisherman	.04	0.7
Grandmother's education (in years)	-.01	-0.6
Grandmother's occupation(c)		
Housewife	.06	1.7
Production	.17	3.6
Miscellaneous	.002	0.1
Included Exogenous Variables		
Father's education	.01	2.7
Mother's age (in years)	.002	1.2
Ethnicity(d)		
Chinese	.04	0.7
Indian	.11	1.6

Table A.3 (cont.)

Independent Variables(a)	Parameter Estimate	t-ratio
Distance to nearest school		
Primary	-.02	-1.2
Secondary	.001	0.2
Child's sex (boy=1)	-.03	-1.0
Chinese sex	.07	1.5
Indian sex	.10	1.4
Child's age (in years)	-.01	-1.5
Current residence(b)		
Kuala Lumpur	.01	0.1
Ipoh	-.23	-0.6
Penang	-.07	-0.8
Other urban	.07	1.4
Chinese x Kuala Lumpur	.07	0.7
Chinese x Ipoh	.40	1.1
Chinese x Penang	.25	2.2
Chinese x other urban	.05	0.8
Indian x Kuala Lumpur	-.22	-1.5
Indian x Ipoh	-.09	-0.2
Indian x Penang	-.14	-0.9
Indian x other urban	-.41	-4.5
Household income in Malaysian $ (000)	.001	1.2
Business income in Malaysian $	.02	0.8
Farmland owned by household (in acres)	-.06	-1.8
Intercept	-.02	
N	1106	
R^2	.21	

(a) This equation includes variables for grandfather's, grandmother's and father's education missing, grandfather's and grandmother's occupation, missing, and missing household and business income for which we do not not report coefficients.

(b) Rural omitted.

(c) Farm omitted.

(d) Malay omitted.

Table A.4

REDUCED FORM EQUATIONS FOR TABLE 4: EDUCATION

Independent Variables(a)	Parameter Estimate	t-ratio
Excluded Exogenous Variables		
Age at menarche	.01	0.2
Fetal loss before first birth	-.11	-0.3
Mother's residence at age 15(b)		
Kuala Lumpur	-.04	-0.1
Ipoh	-1.09	-3.8
Penang	-.27	-0.9
Abroad	.12	0.4
Other urban area	-.07	-0.4
Grandfather's education (in years)	.18	5.3
Grandfather's occupation(c)		
Sales	1.10	4.0
Miscellaneous	.79	2.8
Production	-.03	-0.1
Fisherman	-.32	-1.0
Grandmother's education (in years)	.20	2.1
Grandmother's occupation(c)		
Housewife	.60	2.9
Production	.67	2.4
Miscellaneous	-.32	-1.2
Included Exogenous Variables		
Father's education	.30	13.4
Mother's age (in years)	-.12	-1.0
Ethnicity(d)		
Chinese	-.27	-0.9
Indian	-.51	-1.2

Table A.4 (cont.)

Independent Variables(a)	Parameter Estimate	t-ratio
Distance to nearest school		
Primary	-.08	-0.7
Secondary	.02	0.5
Child's sex (boy=1)	.06	0.3
Chinese sex	-.06	-0.2
Indian sex	-.20	-0.4
Child's age (in years)	.004	0.1
Current residence(b)		
Kuala Lumpur	.87	1.7
Ipoh	4.35	1.9
Penang	1.93	3.6
Other urban	.21	0.7
Chinese x Kuala Lumpur	.88	1.3
Chinese x Ipoh	-2.93	-1.3
Chinese x Penang	-1.94	-2.8
Chinese x other urban	.60	1.5
Indian x Kuala Lumpur	.65	0.7
Indian x Ipoh	.16	0.1
Indian x Penang	-2.76	-2.8
Indian x other urban	.19	0.4
Household income in Malaysian $ (000)	.03	4.4
Business income in Malaysian $	-.54	-2.9
Farmland owned by household (in acres)	.12	0.6
Intercept	4.56	
N	1106	
R^2	.50	

(a) This equation includes variables for grandfather's, grandmother's and father's education missing, grandfather's and grandmother's occupation missing, and missing household and business income for which we do not not report coefficients.

(b) Rural omitted.

(c) Farm omitted.

(d) Malay omitted.

Table A.5

MEANS AND STANDARD DEVIATIONS OF VARIABLES

Variable	Mean	Standard Deviation
Expected schooling of child (in years)	10.93	3.23
Age at menarche	13.80	1.73
Fetal loss	.05	.23
Age at first birth	19.92	3.69
Anywork	.59	.49
Modernwork	.21	.40
Mother's residence at age 15		
Kuala Lumpur	.03	.18
Ipoh	.08	.28
Penang	.10	.30
Other	.24	.43
Grandfather's education	1.34	2.50
Grandfather's occupation		
Sales	.13	.34
Miscellaneous	.11	.31
Production	.20	.40
Fisherman	.07	.25
Grandmother's education	.48	1.64
Grandmother's occupation		
Housewife	.35	.48
Production	.09	.29
Miscellaneous	.10	.30
Mother's education	3.03	3.10
Mother's age	34.49	6.27

Table A.5 (cont'd)

Variable	Mean	Standard Deviation
Ethnicity		
Chinese	.43	.50
Indian	.13	.33
Distance to nearest school		
Primary	.62	.75
Secondary	2.48	2.69
Child's Sex	.54	.50
Child's Age	6.93	1.40
Current residence		
Kuala Lumpur	.06	.24
Ipoh	.05	.22
Penang	.06	.23
Other	.24	.43
Household income in Malaysian $ (000)	11.65	11.91
Business income (1 = yes)	.23	.42
Farmland owned by household (1 = yes)	.18	.38

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