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**Women's Education and Fertility in Latin America:
Exploring the Significance of Education
for Women's Lives**

Teresa Castro Martín*
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Introduction

Education has long been recognized as a crucial factor influencing women's childbearing patterns. An extensive demographic literature has been devoted to examining the role of female education in promoting sustained fertility decline (Cochrane, 1979; Jeejeeboy, 1992). The evidence accumulated provides a compelling rationale for advocating increased investment in education and the elimination of institutional and cultural barriers to women's access to schooling in the formulation of policies aimed at promoting development and reducing fertility (United Nations, 1987).

Although the association between education and fertility has been a constant theme in the literature, the availability of data for a large number of countries participating in the World Fertility Survey (WFS) considerably improved our understanding of the relationship. The documentation of empirical patterns for a wide variety of settings inspired increasingly complex views: the impact of education on fertility was no longer regarded as automatic but as conditioned by level of development, social organization, gender stratification and cultural milieu. The new awareness of the complexity of the relationship was accompanied by a shift in the focus of research: the earlier emphasis on statistical associations was replaced by an interest in exploring the processes underlying the impact of education on reproductive behavior. In the search for mediating mechanisms, most of the attention was directed to the proximate determinants of fertility, a legitimate focus given the obvious salience of biological factors in the reproductive process. However, this focus has somehow distorted the original goal of understanding the education-fertility relationship in all its complexity and richness. Ultimately, explanations for the impact of education on both fertility and its proximate determinants need to be searched for outside the biological realm.

Regardless of the approach followed, female education has become an essential component of fertility analysis. Information on schooling is routinely collected in all demographic surveys, and educational attainment is a standard criterion to examine fertility differentials. Because of our familiarity with education as an "independent variable," its significance is sometimes taken for granted. This study aims to provide some insight on what education means to a woman, in terms of cognitive, economic, and normative assets. We will explore how the early experience of schooling transforms a woman's adult world and link these changes to her reproductive behavior.

We will start by discussing three types of educational outcomes and hypothesizing their connection with women's fertility behavior. Next, we provide a brief review of recent trends in female educational attainment in Latin America and an updated description of fertility differentials by education, using recent data from the Demographic and Health Surveys. Once cross-sectional evidence for the education-fertility association is presented, we will examine how the cognitive, socioeconomic and normative world of women, as well as their family formation and work strategies, differ according to educational background. The paper does not intend to provide an exhaustive portrait of the life profiles of educated versus uneducated women, but an "impressionistic" picture (or rather, a collage) of the divergent contexts

in which they live. This exercise might provide some answers on why education has such a decisive impact on fertility.

The Multifaceted Nature of Education

Education has played a central role in all major explanations of fertility behavior. At the macrosocial level, education has been used as an indicator of socioeconomic development in structural explanations of the demographic transition. More recently, it has been recognized as a catalyst of "modernization" in innovation-diffusion theories (Cleland, 1985). At the microsocal level, educated women are usually portrayed as "forerunners" of the transition, i.e., pioneers of fertility change. Given the difficulty to collect information on income, occupation or prestige in demographic surveys, education is typically used as an index of socioeconomic status and as a surrogate for hard-to-measure concepts, such as opportunity costs. Moreover, education is frequently the only available indicator for the more comprehensive concept of women's status, which positions women vis-à-vis men in both the family and society (Mason, 1984, 1986). The wide range of concepts for which education is used as a proxy reflects the multifaceted nature of the educational experience.

The sociology of education literature has drawn attention to various relevant features of the schooling experience. Some perspectives have highlighted the role of the school in knowledge transmission and cognitive development. Human capital perspectives have emphasized education as a factor of production generative of wealth. Another focus has been the social organization of schooling and its socialization functions. Based on these broad approaches, we will examine three key dimensions of education and subsequently explore their potential implications for fertility behavior.

Education as "Source" of Knowledge

Knowledge transmission is probably the school's most explicit goal. Schooling imparts literacy skills, enables pupils to process a wide range of information, and stimulates cognitive changes that shape an individual's interaction with the surrounding world. Schooling not only provides a wider perspective on one's own culture, it also endows individuals with intellectual tools such as categorization, abstraction and logical reasoning.

Education as "Vehicle" of Socioeconomic Advancement

Education not only enhances cognitive abilities, it opens up economic opportunities and social mobility. In most societies, educational credentials are the primary criteria for entry into formal employment and for sorting individuals into the hierarchy of occupations. It is important to note, though, that the assumed correspondence between education and earnings does not always apply to women in societies where the labor market is sex-segmented. Several studies have documented that in Latin America, except for the highly educated strata, female work tends to be poverty-driven

and does not necessarily lead to greater control over resources (de Oliveira and García, 1990). Thus, although education has the potential to enhance women's economic and social position, these benefits are bounded by the structure of the labor market and the gender stratification system of the society.

Education as "Transformer" of Attitudes

Schools have long been recognized as agents of socialization and modernization (Inkeless, 1973). "The school does nearly as well in its subconscious, informal and implicit task of modernizing as it does in meeting its explicitly stated task of imparting certain kinds of knowledge" (Holsinger, 1973). Schooling's role in attitude formation and attitude change goes far beyond the enhancement of conceptual reasoning or other information-processing abilities. Women's exposure to new ideas and behavioral models, for example, may lead to crucial transformations in aspirations and, eventually, to questioning traditional beliefs and authority structures. These subtle changes are linked not only to the content of the school curriculum but also to the organization of instruction and the social process of learning. Participation in school, for example, may bolster a girl's self-esteem, feeling of effectiveness and sense of control over her destiny, despite a home environment and society that foster compliance with a subordinate role.

Potential Paths of Influence of Education on Women's Reproductive Desires and Behavior

The three types of educational outcomes presented above can be assumed to have crucial implications for women's reproductive desires and behavior. We will next discuss some of these potential implications.

Impact of Knowledge on Fertility

Schooling increases reliance on scientific explanations to make sense of the world, inspires wider perspectives, and provides greater awareness of alternative lifestyles. The secular, scientific knowledge acquired in the classroom is not only valuable as an intellectual asset, but is also instrumental in women's daily life. It is illusory, for instance, to think that women can gain control over their fertility without learning first about their bodies in relation to sex, reproduction and health. The knowledge schooling imparts in these areas, even if marginal in the formal curriculum, may be crucial to successful use of contraception. Correct self-administration of birth control pills, for example, as well as confidence in this method, requires an understanding of how the pill affects reproductive physiology. The school experience not only enhances women's informed fertility choices, but also provides them with greater competence to interact with various complex institutions, maximizing their ability to benefit from a range of services, including family planning.

Impact of Socioeconomic Status on Fertility

It can be legitimately argued that education is negatively associated with fertility partly because of its linkage to social status and economic success. In Latin America, as in many developing societies where the gap between affluent and deprived social sectors is wide, access to higher education is largely determined by social origin. The observed disparity in reproductive behavior among educational strata, thus, may be partly a reflection of this polarized social structure (Schoemaker, 1991; Bronfman et al., 1990). Education is linked to wealth and hence to the ability to "afford" more children but, more importantly, education is associated with higher perceived costs of children. Higher consumption goals and higher educational aspirations for children usually lead to the decision to have a small family, in order to allocate more resources to each child (Birdsall and Cochrane, 1982). Besides the implications of family wealth on the selection of reproductive strategies, education enhances women's opportunities to pursue wage-earning activities; this is likely to require some trade-offs concerning domestic and childrearing roles.

Impact of Attitudes on Fertility

Although the influence of maternal education on fertility can be partly attributed to the economic and social advantages it confers, there are abundant indications that there is more to the effect of education. Various studies have shown that the impact of female schooling on childbearing can not be simply reduced to socioeconomic aspects, e.g., family income, husband's education or husband's occupation (Rodríguez and Cleland, 1980; Cleland and Rodríguez, 1988; Rodríguez and Aravena, 1991). The recognition of reproductive behavior as normatively bounded and the increasing awareness of the role of ideational factors in fertility processes (Cleland and Wilson, 1987; Lesthaeghe and Surkyn, 1988) have led to a growing interest in examining education as a catalyst of normative change (Caldwell, 1980). In this context, education is regarded as a decisive stimulus to shift from a traditional value scheme, where major lifetime decisions, such as number of children, are routinely left to fate (or God), to a value system where the belief in a controllable destiny favors a predisposition to planning which applies also to the sphere of childbearing. Education also imparts a sense of trust in science and technology, which is indispensable for daily use of modern contraception. In addition, education induces crucial transformations in the locus of reproductive and contraceptive decisions, the family. Some studies have suggested (though there is need for further evidence, since many of these processes are culture-specific) that education plays an important role in the evolution towards a nuclear family, conjugally bonded and child-centered. Greater emotional intimacy and more egalitarian power relationships between partners may facilitate the use of contraception. Another aspect of family dynamics relevant to fertility decisions is the style of mother-child interaction. LeVine (1990) and LeVine et al. (1991) have shown that education changes the perceptions of mothers regarding the amount of personal attention required by young children. Thus, by redefining the maternal role as more time intensive, education can act as an important deterrent to high fertility.

In sum, the school as a social institution provides general and practical knowledge, credentials for employment, an expanded social network, and socialization in modern values. The outcomes of the schooling experience will differ according to duration of attendance and type of school as well as to quality and style of instruction, but they will retain their influence throughout the woman's lifetime. The cognitive, economic and attitudinal assets acquired during the "formative" period will shape women's reproductive decisions later in their lives. Some linkages are direct and explicit. Literacy, for example, conditions access to information and thus is clearly instrumental for informed fertility choices. Also, by enhancing the access to a satisfying and financially rewarding job, education raises the opportunity costs of children. The connection between attitudinal change and fertility is more subtle and requires a more psychosocial explanation; however, it is equally crucial. A shift away from "fatalistic" acceptance of reproductive outcomes is essential for creating a willingness to plan fertility, more pedagogical nurturing styles place a limit on the number of children that can be satisfactorily brought up, and a more balanced power distribution within the family provides women with true control over choices in reproduction. There are sound indications that all these processes are either induced or assisted by education (Kasarda et al., 1986; Eisemon, 1987; de Vries, 1992).

Data

The analysis is based on data from the first round of the Demographic and Health Surveys (DHS-I), which covered nine countries in Latin America. The basic survey characteristics, i.e., year of fieldwork and sample size, are presented in Table 1. All the surveys included all women of reproductive age, regardless of marital status. Table 1 also provides some economic, social and demographic indicators for the countries under consideration, in order to illustrate the variety of contexts coexisting within the region.

Education is measured, following the usual convention, by length of school attendance. Information on other aspects of the schooling experience, such as intensity, quality, content and style of instruction, which would be valuable for the purposes of this study, are not available. Completed years of schooling are grouped into five categories: 0, 1-3, 4-6, 7-9 and 10+. This five-fold classification is flexible enough to capture a variety of patterns, including nonlinear and non-monotonic relationships.

The Demographic and Health Surveys like the earlier World Fertility Survey, are standard demographic surveys, aimed primarily at collecting detailed data on reproductive histories and proximate determinants, such as contraceptive use. Hence, they provide only general information on socioeconomic context and just indirect hints on ideological and cultural factors. The data available, thus, impose major constraints on the kind of analysis possible.

Table 1. Survey Characteristics and Selected Economic and Demographic Indicators for Nine Latin American Countries

	DHS		GNP per Capita (US \$)	Rural Popu- lation (%)	Infant Mortality Rate (p/1000)	Family Planning Program Effort (% of maximum)
	Year of Fieldwork	Sample Size				
Bolivia	1989	7,923	620	49	102	23
Brazil	1986	5,892	2,540	25	60	32
Colombia	1986	5,329	1,200	30	39	62
Dominican Republic	1986	7,649	790	40	61	54
Ecuador	1987	4,713	1,020	44	60	58
El Salvador	1985	5,207	1,070	56	59	68
Guatemala	1987	5,160	910	61	54	53
Mexico	1987	9,310	2,010	27	40	77
Peru	1986	4,999	1,010	30	82	51

Sources: UNDP, 1992; Ross et al. (1992); DHS standard recode files.

Notes: Survey samples covered all women age 15–49 (15–44 in Brazil and Guatemala).

Indicators refer to the period 1986–1990.

Recent Educational Trends in Latin America

Within the developing world, Latin America ranks relatively high in educational achievement. The efforts aimed at eliminating illiteracy have been quite successful, and primary schooling, though not universal, is widespread. However, the region is far from homogeneous, and a country's location in the development spectrum continues to influence the availability of educational resources and women's access to them.

Table 2 presents several indicators of women's educational attainment in the nine Latin American countries under consideration. Guatemala, with forty-two per cent of the women interviewed lacking any formal schooling and only two thirds of the school-age girls actually enrolled in primary school, is at the lower end of the educational spectrum. There is also evidence of educational deprivation among a sizable sector of the female population in El Salvador and Bolivia, where approximately one-fifth of the women interviewed had never attended school. The rest of the countries display a more favorable educational composition: most women have attended school, although less than one-third have remained in the school system for ten or more years.

Table 2: Percent Distribution of Women According to Several Indicators of Educational Attainment

	Years of Schooling ^{\a}					Literacy ^{\a}		Gross Enrollment Ratios ^{\b}			
								Primary		Secondary	
	0	1-3	4-6	7-9	10+	Reads with Difficulty	Reads with Ease	Male	Female	Male	Female
Bolivia	17.4	21.6	19.9	15.4	25.7	20.5	56.9	97	85	40	35
Brazil	7.4	22.3	31.6	16.0	22.6	14.5	73.4	101	97	31	36
Colombia	6.9	23.9	31.3	21.0	16.8	13.7	79.7	112	115	55	56
Dominican Rep.	5.9	20.9	24.7	21.0	27.6	14.2	72.2	124	129	44	57
Ecuador	7.8	14.8	32.7	16.1	28.6	13.0	76.7	118	116	55	57
El Salvador	21.3	24.6	24.6	13.4	16.0	16.8	55.5	77	81	27	30
Guatemala	41.7	24.1	19.6	6.2	8.4	18.0	40.7	77	65	50	17
Mexico	11.6	16.6	31.4	26.4	14.0	...	87.3	119	116	54	53
Peru	10.9	17.8	24.3	17.0	29.9	14.3	69.6	125	120	68	61

Notes: Schooling and literacy refer to women interviewed in DHS, i.e., age 15-49 (15-44 in Brazil and Guatemala).

Sources: ^{\a} DHS standard recode files.

^{\b} UNESCO Statistical Yearbook 1989.

In most societies, males and females have unequal access to education. Institutional and normative constraints create both explicit and subtle barriers to women's educational advancement. In Latin America, however, the gender gap in educational attainment is considered, in a worldwide comparative perspective, to be fairly narrow. The data on enrollment ratios in Table 2 suggest that there is no obvious gender-based differential in access to educational resources. Female enrollment declines at higher levels of training, but the same can be observed for males. Women are substantially under-represented in secondary education only in Guatemala. This apparent gender balance should be interpreted prudently, since enrollment figures do not capture the entire reality of education. Drop-out rates, quality of instruction,¹ and orientation toward different fields of study may well differ for males and females.

In the last few decades, the educational attainment of Latin American women has been substantially upgraded. The successful reduction of illiteracy and the progress towards universal primary schooling have been remarkable achievements, especially given the unfavorable economic situation. Table 3 presents some indicators of recent trends in female educational attainment.

¹Five of the countries examined have enrollment ratios over 100 at the primary level, suggesting that some youngsters remain in the school system beyond the corresponding ages. Overage pupils reflect a pattern of late entry into school and/or a high rate of repetition, both signs of a deficient quality of education.

Table 3: Indicators of Trends in Female Educational Attainment

	Mean Years of Schooling		Mean Years of Schooling		Percent Literate	
	DHS	WFS	Age	Age	Age	Age
			20-24	40-44	15-19	40-44
Bolivia	5.9	...	7.2	4.3	93.2	45.3
Brazil	5.9	...	6.6	4.4	93.2	78.4
Colombia	5.8	4.4	7.0	3.7	96.3	80.6
Dominican Rep.	6.8	4.6	8.2	4.5	91.7	71.6
Ecuador	7.1	5.7	8.3	5.4	95.5	73.9
El Salvador	4.8	...	5.9	2.9	86.5	61.2
Guatemala	3.9	...	3.7	2.1	72.5	45.5
Mexico	6.2	4.0	7.5	4.1	94.1	69.5
Peru	5.4	3.7	7.6	4.1	93.7	63.1

Sources: WFS and DHS standard recode files.

A comparison of the WFS and DHS data, collected roughly one decade apart, reveals a significant enhancement of female education in the five countries for which both surveys are available: the mean duration of school attendance increased in the range of 1.4 to 2.2 years. National averages tend to underestimate the magnitude of actual change. A comparison of the educational attainment of older and younger cohorts provides a more meaningful indication of recent trends. Thus, the contrast between the average schooling of women age 40 to 44 and women age 20 to 24 suggests a larger improvement than previously noted: younger cohorts have gained around 3 years of schooling, except in Guatemala and Brazil, where generational gains have been on the order of 2 years. Similarly, by comparing the literacy status of women age 40 to 44 with that of women age 15 to 19, it becomes clear that, with the exception of Guatemala, where over one fourth of young women still lack literacy skills, the rest of the countries have been quite successful at eradicating illiteracy: over 90 percent of young women are literate and they attend school at least 6 years, the usual time to complete primary schooling.

Despite its favorable educational record, Latin America has entered the 1990s facing critical challenges. Most of the countries are coping with the crippling effects of foreign debt and bearing the social costs of remedial structural adjustment programs. During the 1980s, the region experienced economic stagnation, growing social inequality and gradual marginalization of larger sectors of the population (ECLAC, 1989), which placed women at a particularly vulnerable position (ECLAC, 1990). The reduction of expenditures in key social sectors such as health and education is likely to aggravate further the problem of inequity. Future progress in education is uncertain. On the one hand,

governments, international organizations and NGOs are once again looking at education as a pivotal developmental factor and as a priority investment for the region to recover from the "lost decade" (ECLAC, 1992a). On the other hand, pervasive cuts in educational expenditures may lead to a deterioration in the quality of education which will be difficult to restore (Morales-Gómez and Torres, 1992).²

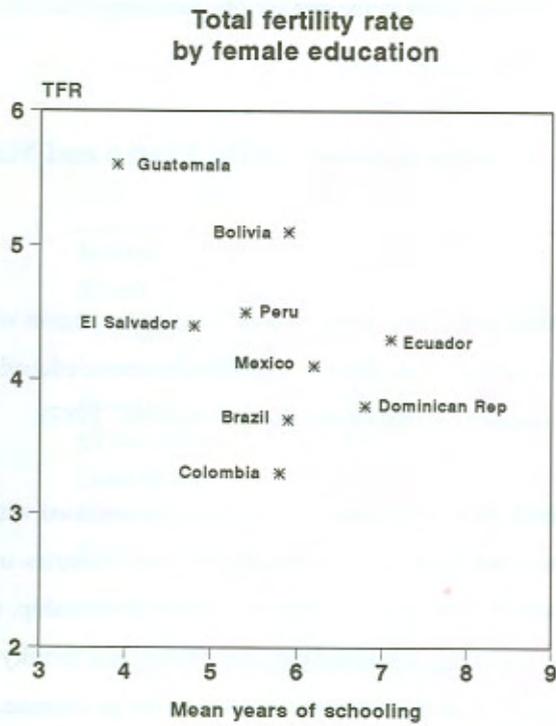
The Association between Education and Fertility: Current Evidence at the Macro and Micro Levels

According to earlier studies, from a worldwide comparative perspective, Latin America stands out as the region where the education-fertility relationship is strongest and most clearly negative. Wide fertility differentials among educational groups are usually found in societies positioned at "medium" stages of development (United Nations, 1987).

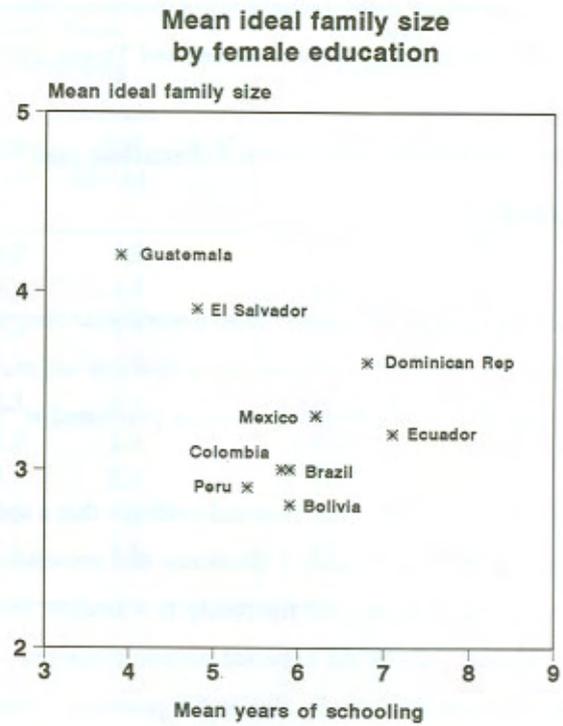
At the macro level, there is sound evidence that a society's overall level of education is negatively associated with its level of fertility. Figure 1 illustrates this association using national averages. Although the nine countries under consideration do not fall rigorously in a straight line, which would correspond to a perfect linear relationship, their positioning follows the expected pattern: mean years of female schooling is inversely related to the total fertility rate and to mean ideal family size and is positively related to median age at marriage and contraceptive prevalence.

²Latin America has repeater rates that are among the highest in the world (46 per cent in the first grade) (ECLAC, 1992b).

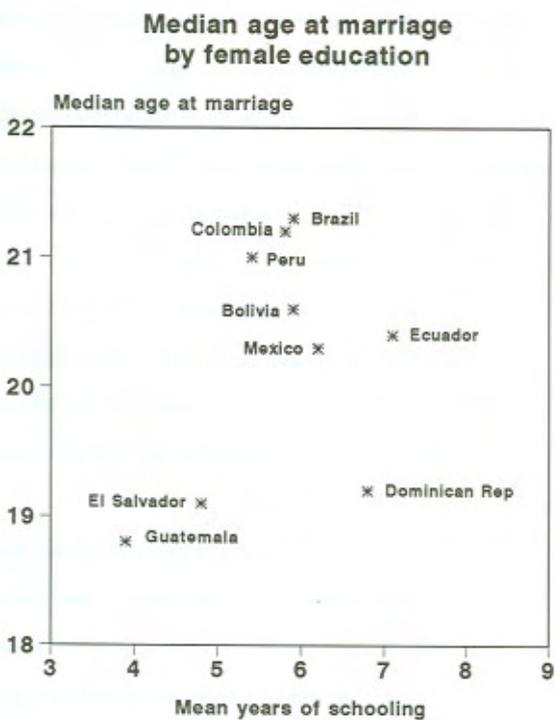
Figure 1: Selected Demographic Factors Related to Female Education at the Macro Level



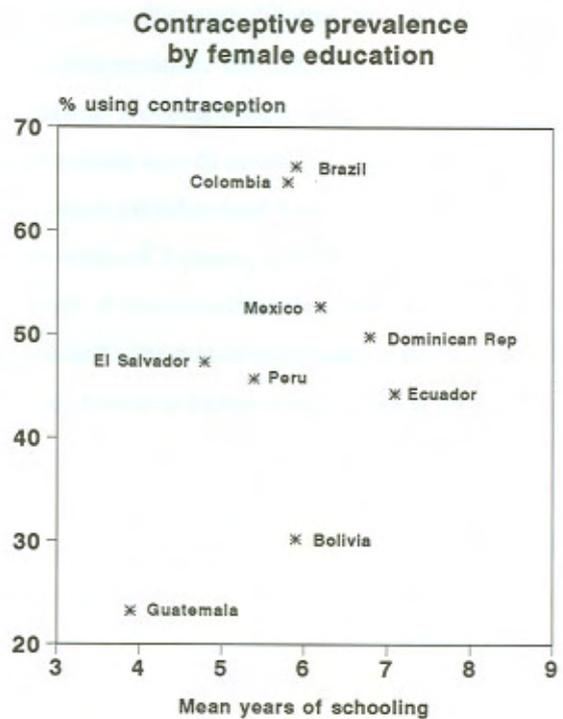
Note: TFR based on the 5-year period prior to the survey.



Note: Based on ever-married women who gave a numeric response.



Note: Life table estimates. Marriage includes any type of union.



Note: Based on currently married women. Includes both traditional and modern methods.

The association is more obvious, and also more meaningful, at the individual level. Table 4 presents fertility rates for contiguous educational subgroups. As expected, fertility drops with increasing educational attainment. In some countries, fertility decline is modest in the lower educational categories and steep in the upper educational strata. This pattern is congruent with the notion of a threshold level beyond which the impact of education becomes increasingly pronounced (Tienda, 1984; United Nations, 1987; Flórez, 1989). When women at the lower and upper end of the educational spectrum are contrasted, a large divergence in fertility behavior becomes evident: the gap ranges from 3.2 children in the Dominican Republic to 4.9 children in Peru. These large fertility differentials reveal a highly polarized society, in which socially distant groups follow totally different reproductive strategies (Juárez, 1993). In fact, the fertility levels of the lower and upper strata could be regarded as corresponding to two societies at different stages of the fertility transition. Poorly educated women have fertility levels typical of pretransitional societies, in the range of 6 to 7 children, while better-educated women have family sizes analogous to women in the developed world, in the range of 2 to 3 children.

To explore further the causes of observed fertility differentials, data on desired family size and contraceptive use, according to educational background are presented in Table 4. These data reveal that preferences regarding number of children do not differ much among uneducated and educated women, once age and parity are taken into account. Fertility norms are surprisingly homogeneous throughout the educational spectrum: variation in desired family size is around one child or less. Accordingly, observed fertility differentials cannot be attributed to divergent desires, but on how differently those desires are translated into behavior (Bongaarts and Lightbourne, 1990). Poorly educated women seem to share with educated women a small family norm, but they are less successful implementing it and, as a result, are much more likely to have an unplanned birth.

In contrast with the observed affinity in fertility preferences, contraceptive practices vary widely according to education (Castro Martín and Njogu, 1993). Table 4 shows that the gap in contraceptive prevalence between uneducated women and highly educated women ranges from approximately 20 percentage points in Colombia and the Dominican Republic to more than 40 percentage points in Bolivia, Ecuador, Guatemala, Mexico and Peru.³ In general, the lower the national level of contraceptive prevalence, the larger the gap in contraceptive behavior between poorly and better educated women.

In sum, observed fertility differentials by education do not seem to be caused by divergence in fertility goals, but by varying degree of success in the implementation of those goals. The next section contains a description of how women's life circumstances differ in relation to the three dimensions linked to education previously discussed: knowledge, socioeconomic status and attitudes. These dimensions may provide some insight into the large discrepancy between reproductive desires and practice among poorly educated women.

³ The magnitude of the gap is probably underestimated, since parity differentials among educational groups are not taken into account.

Table 4: Total Fertility Rates, Mean Desired Family Size and Contraceptive Prevalence According to Women's Years of Education

	TFR ^a						Mean Desired Family Size ^b						Contraceptive Prevalence ^c					
	Total	0	1-3	4-6	7-9	10+	Total	0	1-3	4-6	7-9	10+	Total	0	1-3	4-6	7-9	10+
Bolivia	5.1	6.2	6.4	5.3	4.2	2.8	2.8	2.6	2.6	2.9	2.8	3.0	30	12	23	31	43	53
Brazil	3.7	6.7	5.2	3.4	2.8	2.2	3.0	3.0	3.1	2.9	2.9	2.9	66	47	59	71	76	73
Colombia	3.3	5.6	4.5	3.6	2.5	1.8	3.0	3.2	3.1	3.0	2.9	2.9	65	53	61	65	73	73
Dominican Rep.	3.8	5.8	5.0	4.4	3.5	2.6	3.6	3.6	3.7	3.5	3.5	3.5	50	38	47	51	49	57
Ecuador	4.3	6.4	6.3	4.7	3.5	2.6	3.2	3.4	3.4	3.3	3.0	3.1	44	18	37	43	50	61
El Salvador	4.4	6.0	5.2	3.9	3.5	2.5	3.9	4.3	4.0	3.5	3.3	3.3	47	37	42	55	51	64
Guatemala	5.6	6.9	5.6	4.2	2.8	2.7	4.2	4.6	4.0	3.5	3.7	3.4	23	10	24	42	60	60
Mexico	4.1	6.4	6.3	4.0	2.7	2.4	3.3	4.0	3.4	3.2	3.0	2.9	53	25	44	58	70	69
Peru	4.5	7.4	6.1	4.6	3.7	2.5	2.9	3.0	3.1	2.8	2.8	2.8	46	19	33	46	60	67

Source: DHS standard recode files.

^a TFR is based on the 5-year period prior to the survey and refers to women age 15-49 (15-44 in Brazil and Guatemala).

^b Desired family size is adjusted by the woman's age and number of living children.

^c Based on currently married women.

Women's Life Circumstances Linked to Education Relevant to Reproductive Behavior

Once the inverse relationship between education and fertility is unequivocally established, the next logical step is to inquire about the channels through which this relationship operates. In previous studies, most of the attention has been directed to the impact of education on fertility through the proximate determinants, particularly marriage timing, breastfeeding duration and contraceptive use. More subtle mechanisms of operation, such as women's expectations from family life, spouse selection, patterns of conjugal interaction, power relationships or women's sense of control over their body and destiny, have often been overlooked. One of the main reasons is that standard demographic surveys do not provide in-depth information on these social and psychosocial processes, and qualitative data are scarce. However, the information available in DHS can provide indirect evidence of some of the changes that education triggers in women's lives. We have formerly grouped educational assets under three broad categories: cognitive, economic and attitudinal. The DHS data provide several indicators related to these concepts:

- *Knowledge*
 - exposure to mass media
 - awareness of source of modern contraception
 - correct understanding of the ovulatory cycle
- *Socioeconomic position*
 - husband's education
 - urban/rural residence
 - household appliances
- *Attitudes*
 - degree of "fatalism," measured by reluctance to use contraception when no additional birth is wanted
 - degree of "control" over reproductive process, measured by parity at first use of contraception.

The ways in which women differ in these cognitive, socioeconomic and attitudinal domains according to educational attainment are described in Table 5. Because the cross-tabulation of nine countries and multiple indicators would result in a cumbersome matrix, we have presented the results for only three countries, positioned at different stages of the fertility transition: Guatemala (TFR of 5.6), Ecuador (TFR of 4.3) and Colombia (TFR of 3.3).

As previously noted, knowledge is the most direct outcome of education. Schooling not only imparts knowledge as part of its curriculum, but stimulates the acquisition of additional information from other channels. The data on radio audience in Table 5, for instance, suggest that education increases women's exposure to mass media. Communication research further suggests that mass media can influence fertility attitudes and behavior by publicizing nontraditional life styles, including smaller families, and by creating a climate conducive to behavioral change.

Regarding the second indicator of knowledge, Table 5 shows that awareness of a source/provider of modern contraception increases significantly with women's education. Thus, the data suggest that knowledge of practical matters, such as access to means of fertility control, though not imparted as part of the school curriculum, increases with education. Only in societies at an advanced stage of the fertility transition, such as Colombia, is education not a decisive factor in this matter.

Another facet of knowledge closely connected to fertility is women's understanding of the basic facts of human reproduction. The data in Table 5 reveal that the proportion of women who have an adequate understanding of their reproductive physiology is remarkably low. Women's ignorance about their own body obviously hinders successful contraceptive use, though this impediment is rarely addressed by family planning services. Sexual and reproductive health education are also marginal to the school curriculum (except for some biology training); nonetheless, the data suggest that education considerably enhances women's knowledge about their bodies.

Table 5: Differentials in Women's Background and Life Experiences According to Education

	Guatemala					Ecuador					Colombia				
	0	1-3	4-6	7-9	10+	0	1-3	4-6	7-9	10+	0	1-3	4-6	7-9	10+
Knowledge															
% listens to radio daily	44	58	73	80	78	74	82	88	94	96	67	79	83	88	88
% knows source of modern contraception	45	75	93	97	100	60	79	90	95	99	96	99	99	100	100
% knows ovulatory cycle correctly	4	8	21	41	53	7	7	17	33	53	11	18	30	45	72
Economic status															
Husband's mean years of education	1.5	2.9	5.7	8.6	11.9	3.0	4.1	6.1	8.4	12.6	2.6	3.4	5.1	7.8	11.1
% lives in urban area	18	26	55	78	87	28	32	50	74	89	50	49	70	89	91
% has refrigerator	2	8	20	46	68	11	22	35	51	76	20	30	43	67	79
Attitudes															
% not using contraception when no additional birth wanted \a	75	54	37	10	17	71	52	42	37	19	36	25	22	12	13
Mean CEB at first contraceptive use \b	3.9	3.0	2.1	1.5	1.1	4.6	4.0	2.8	1.9	1.3	3.8	2.9	2.0	1.3	0.6
Family formation paths															
Mean age at first union	17.3	17.5	18.6	19.5	21.5	18.3	18.4	18.7	18.9	21.0	17.9	18.9	19.5	19.9	21.8
% in legal union	56	55	66	78	86	62	62	62	63	86	42	64	60	72	86
% had a premarital birth \c	7	9	9	6	5	24	15	12	10	5	21	15	15	11	5
% had first birth before age 18 \c	35	30	21	11	4	32	30	23	16	6	38	26	19	10	3
Working paths															
% worked before marriage	34	45	51	53	69	61	59	54	51	54	49	46	49	55	62
% kept wages \d	22	23	24	24	45	40	38	49	56	62	30	29	32	33	44
% worked after marriage	18	24	30	33	57	46	43	32	40	57	29	26	30	36	53

Source: DHS standard recode files.

Notes: Based on all currently married women, except noted otherwise.

\a Among non-pregnant women.

\b Among women who have ever used contraception. CEB refers to number of living children.

\c Among all women age 20-49.

\d Among those women who worked before marriage.

With regard to socioeconomic status, the data in Table 5 confirm the expected association between women's education and their position in the socioeconomic structure. Better-educated women have higher household incomes, as can be inferred from their husband's education, tend to reside in urban areas, and have a higher standard of living, as suggested by the data on refrigerator ownership. Although it is difficult to disentangle the various advantages conferred by education, it is reasonable to assume that part of the impact of education on fertility is connected to women's socioeconomic context.

The third outcome of education, normative change, is always difficult to conceptualize, and more so to measure. Table 5 presents indicators of two diametrically opposed attitudes in the sphere of reproduction: *fatalism* and *control*. According to these data, educated women have a less fatalistic approach to life and a higher command over their reproduction. It can be noted that, given a situation when no additional child is desired, educated women are more likely to find the means to prevent further pregnancies, and thus successfully implement their desires. The tendency to plan one's family not only applies to issues of size but also of timing, as suggested by the early stages of family formation at which educated women start to regulate their fertility.

In sum, the cognitive, economic and normative assets acquired through schooling could plausibly explain the decisive influence of education on fertility. Education induces critical changes in women's situation; their understanding of the world, their productive capacities, and their beliefs about society and self. These changes, in turn, will influence marriage age, contraceptive use, family size preferences and, ultimately, fertility.

The multiplicity of facets in women's lives touched by education encompasses both private and public domains. Table 5 presents a succinct description of women's family formation and work profiles along educational lines. The data show that women's schedules of family formation vary greatly according to education. Better-educated women have a later entry into a conjugal union, and this union is more likely to be legally formalized. They also are older when they initiate their childbearing and less likely to have a premarital birth. These early stages of family formation will impinge on their lifetime fertility.

Women also follow different work paths according to their educational attainment. We have previously mentioned that although formal education usually opens up economic opportunities, in many Latin American countries the labor market is highly sex-segregated and many women see themselves trapped in subsistence-level jobs, as part of a household strategy of income-pooling. Since the data available do not provide detail on type of work, e.g., formal/informal sector, we must be cautious not to equate economic activity with economic independence. However, it is reasonable to assume that women with better educational credentials find it easier to get a satisfying and financially rewarding job. The data in Table 5 show that education is positively associated with the rate of labor force participation before marriage (except in Ecuador), and even more strongly after marriage. The data also indicate that, among those who worked before marriage, better-educated women are more likely to keep their wages for themselves, which suggests that education enhances women's control over their own incomes.

Observed Effect of Education versus Net Effect of Education: Inferring the Mediating Influence of Schooling Outcomes

The previous section included a description of how several aspects of education shape the adult world of women, including their reproductive behavior. Although Table 6 is not intended to provide an accurate estimate of the *mediating* effect of these schooling outcomes, it does provide some insight into the magnitude of their intervening role: regression coefficients that measure the impact of education on cumulative marital fertility are compared before and after controls for cognitive, economic and normative factors, as well as early circumstances of family formation and working paths. OLS regression is not the most appropriate methodological tool for this type of analysis since the assumption of homoscedasticity, i.e., constant variance of the dependent variable, is obviously violated: the variance

of children ever born increases considerably with marital duration. However, we chose to use this simple and easy-to-interpret model for exploratory purposes.⁴

According to these estimates, most of the variables under consideration have a statistically significant effect on cumulative fertility, though the results vary from country to country.⁵ For instance, none of the indicators of knowledge have a relevant impact on fertility in Guatemala, but two of them are statistically significant in Ecuador. The effects of the various explanatory variables are in the direction expected, except for young age at marriage and work before marriage. The analysis confirms that wife's education influences fertility not only independently from husband's education, but also more strongly. Enhanced knowledge (though not in all countries), socioeconomic position and attitudes favorable to planning childbearing, as well as later onset of family formation and work activity after marriage are all key factors in reducing fertility.

It is important to note that the size of the education coefficients is considerably reduced after applying controls, suggesting that there is a relevant mediation effect of the cognitive, economic and attitudinal factors considered. However, except for Guatemala, the coefficients for education retain their statistical significance in the multivariate model. This can be due to the imperfect measurement of the constructs employed, but it could also imply that the effect of education goes beyond the pathways hypothesized, illustrating the difficulty of constructing a formal model that captures the reality in all its complexity.

⁴Marital duration is controlled and squared to allow for different effects at short and long durations.

⁵Since tests of statistical significance assume simple random sampling and DHS surveys are based on complex sample designs involving stratification and clustering, and since the assumption of homoscedasticity is violated, a stringent significance level, i.e., $p < .01$, is employed in this analysis.

Table 6: Effect of Women's Education on Number of Children Ever Born. Summary of OLS Regression Beta Coefficients. Bivariate and Multivariate Models.

	Guatemala	Ecuador	Colombia
Women's education			
(0)			
1-3	-0.27* -0.15	-0.15 -0.01	-0.66* -0.41*
4-6	-0.76* -0.33*	-0.83* -0.44*	-1.35* -0.77*
7-9	-1.06* -0.23	-1.30* -0.54*	-1.70* -0.63*
10+	-1.10* 0.03	-1.74* -0.50*	-1.99* -0.55*
Husband's education			
(0)			
1-3	-0.03	0.02	-0.24
4-6	-0.23*	-0.22	-0.53*
7-9	-0.32	-0.39*	-0.49*
10+	-0.21	-0.34	-0.62*
Knowledge			
Listens to radio daily	0	-	0
Knows source of modern contraception	0	-	0
Understands ovulatory cycle	0	0	-
Economic status			
Urban residence	-	-	-
Has refrigerator	-	-	-
Attitudes			
Contraception at parity 0 or 1	-	-	-
Family formation paths			
Age at first union < 16	-	-	0
Cohabiting	-	0	0
Had premarital birth	+	+	+
Had first birth < 18	+	+	+
Working paths			
Worked before marriage	+	0	0
Worked after marriage	-	-	-

Notes: * : $p < .01$; +/- : $p < .01$; 0 : $p > .01$

Based on currently married women. All models control for marital duration.

Summary and Discussion

This study has provided an overview of the association of female education and fertility using current data for nine Latin American countries. Although fertility differentials by education have narrowed with respect to a decade ago (Weinberger et al. 1989), childbearing patterns of different educational strata remain disparate, resulting in the coexistence of distinct fertility regimes within the same society. The analysis showed that reproductive preferences do not differ much among educational groups, whereas contraceptive behavior differs widely. All evidence points to education as the crucial factor behind the harmonization of desires and practice.

Among the questions raised were *why* the sequels of early school experience remain operant in the postschool years, e.g., influencing lifetime fertility, and *how* schooling, which rarely addresses issues directly relevant to sexual, reproductive and contraceptive behavior, influences women's childbearing patterns so decisively. We pointed out several aspects of the educational experience that have long-lasting implications for women's lives. Namely, we discussed (a) education as a source of knowledge and cognitive skills, (b) education as a resource that enhances economic opportunities and social mobility, and (c) education as a socialization process that shapes attitudes, values and aspirations.

The divergence in cognitive, economic and normative assets might explain why poorly-educated and better-educated women live such different lives. The analysis showed that education largely determines women's family formation strategies and work profiles. Our intention was not to offer an exhaustive inventory of all the vital changes that education activates, since the reality is infinitely more complex and richer than this brief synopsis can depict, but to illustrate how education shapes the whole spectrum of women's roles, i.e., as individuals, citizens, wives, mothers, and workers. If education has such a pervasive effect, reproductive behavior obviously cannot elude its influence.

Many questions remain unanswered. Among them, whether the ideological or the economic repercussions of schooling are more relevant for fertility behavior. The *modernizing* effect of education is difficult to disentangle from concomitant changes in labor force participation, income or urbanization, especially in societies where the higher levels of education are usually reachable only by the affluent strata. Nevertheless, increased recognition of the multifaceted nature of education undermines the rationale for treating economic and ideological perspectives as mutually exclusive and favors an integrative approach.

Another unsolved issue is *how much* education is needed to change women's orientation towards life, specifically, towards family life? Though a precise answer was not researched, we can presume that a few years of education can have only a superficial impact on knowledge and attitudes and are obviously insufficient as employment credentials. It takes at least 5 to 8 years to acquire the reading and mathematical skills essential for operational literacy and

numeracy. Thus, it is not unrealistic to assume that an education beyond the primary level is needed to promote intellectual curiosity, enhance social status, and inspire genuine changes in family dynamics.

Despite the centrality of education in demographic analysis, the significance of education for women's lives tends to be taken for granted and not explicitly examined. Also, too little attention has been paid to relevant debates within the sociology of education on the role of the school (Giroux, 1985; Burgess, 1986; Wexler, 1987). Demography could benefit greatly from the concepts and theories developed in this discipline, since the relationship between education and fertility can be easily encompassed within the more general theme of education and social change.

In traditional educational theories, schools were considered as mere instructional sites, and a tacit faith in a meritocratic society shaped their central theme: the value of education for social mobility. The new sociology of education emerged in the early 1970s as a critical response to a discourse that did not question the relationships among knowledge, power and social organization. Against the claim of political neutrality, the proponents of the new sociology of education were concerned by the complicity of the school system in perpetuating and legitimizing social inequality. *Correspondence* (Bowles and Gintis, 1976) and *reproduction* (Bourdieu and Passeron, 1977; Apple, 1982) became focal concepts, conveying a message of distrust on the socially reformative power of education. Against the assumption that schools transmit objective knowledge, critics argued that school knowledge was a particular representation of the dominant culture, constructed through a selective process of emphases and exclusions. Against the notion of schools as mere instructional sites, "cultural capital" theorists argued that teaching methods, evaluation criteria, and the way knowledge was organized as well as the social relations within classroom were as influential as the knowledge transmitted, and developed the concept of *hidden curriculum*. Although critical perspectives tend to emphasize the school's complicity in maintaining the existing social order, some theorists, such as Freire and Macedo (1987), have emphasized the role of education in the development of critical consciousness and emancipatory thinking, and thus imbedded with the potential for instigating profound social change.

Although the new sociology of education challenged many of the longstanding assumptions that concerned schooling two decades ago, this literature has had only marginal influence on the treatment of education in fertility studies. Many of the arguments mentioned merit incorporation into the demographic discourse. For instance, traditional educational theories that focus on education as an avenue for social mobility can provide some insights on the potential of schooling not only to break the continuity between family background and social placement in adult life, but also to break with traditional roles socially ascribed to women. By questioning the assumption of schools as class-neutral and gender-neutral institutions, the literature on education and social inequality creates awareness of an important issue: if access to education is not truly universal, the school may face the risk of merely legitimizing the existing social status quo instead of promoting individual advancement and societal change. The literature focusing on the content and social organization of schooling can also lead to channel more attention on the quality of education (Heyneman and White, 1986). Until now, few studies have focused on the quality and scope of school programs, even when the

reality is that in most developing countries educational goals are hampered by a lack of facilities, trained educators and teaching materials, and by an instruction style that emphasizes memorization and passive absorption of information.

In addition to these lines of thought, gender perspectives have addressed how the concept of femininity limits the educational aspirations of women, and how the gender stratification system not only bounds the access of women to education, but also shapes its quality and contents and determines whether women's educational assets can be fully translated into social and economic opportunities (Kelly and Elliot, 1982). This literature is relevant to all demographic studies concerned with sex differentials in educational attainment and socioeconomic outcomes of female education.

Hence, nondemographic disciplines can serve as a source of inspiration for explanations and new themes to expand the research agenda. The data and methods available, though, constitute a major constraint. Although large-scale surveys offer an incomparable source for examining the linkages between education and fertility in a cross-national context, more research is needed on the microprocesses (e.g., LeVine et al., 1991). Future research could benefit from the collection of data designed to encompass the qualitative dimensions of education and to operationalize the psychosocial impact of school in terms of cognitive development and value orientations.

In brief, this paper has been oriented around the question, "How does education influence women's lives in the multiplicity of roles they assume?" We have argued that the cognitive, productive and ideological assets acquired through schooling will shape the social conditions of women's adult world and the meaning women attach to their sexual and reproductive experiences. They will also shape their choices of lifestyle in the domains of family and work. Education will enable these choices to be less constrained by traditional social expectations and, in that sense, more free and in better accord with women's own needs and preferences. Without overlooking the pragmatic aspects of education in terms of jobs and national development, a more humanistic view of education as a source of personal development and quality of life might provide some clues on why its influence is so decisive on childbearing behavior.

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