

## EDUCATION AND FERTILITY IN THE PHILIPPINES

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*The relationship between education and fertility was examined in this study using data collected in the 1977 round of the Seven Provinces Survey for the provinces of Misamis Oriental and Southern Leyte in the Philippines. The analysis involved 2,207 currently married women aged 30 and over. The findings revealed a general inverse relationship between years of school completed and number of children ever born. Marked declines in fertility were found at the points of completing elementary, high school, and especially college education. Similar patterns were observed within each residential classification of urban and rural areas. Both education and urban residence were independently and positively associated with practice of family planning. Implications for investments in education are noted.*

### *Introduction*

Studies examining the relationship between education and fertility have in general found that increasing years of formal schooling is associated with declining fertility (Concepcion, 1964; del Fierro, 1974; Dinkel, 1965; Grabill, et al., 1958; Hawley, 1955). This finding has generated considerable interest particularly among demographers and government planners in developing countries engaged in programs of socio-economic development and population control. Encouraged by the experiences of western countries where fertility declines have been attributed, at least in part, to advances in education of the general population, government planners in developing countries advocate large investments in education as a means of checking growth in their populations (Stycos, 1967).

The Philippines is one government which has given special emphasis to the role of education in fertility reduction. Since 1972, the country's educational system has been receiving special inputs from both the national government and the United Nations Fund for Population Activities (UNFPA) on its Population Education Program (PEP). Designed to integrate topics on population and family planning into major courses at all

grade levels<sup>1</sup>, the program justifies its heavy outlays in teacher training, preparation of new textbooks and population related materials, and other operational expenditures partly on the basis of the presumed negative effect of education on fertility (Reyes, 1976).

While knowledge of whether or not education produces a decline in human fertility is important, it is more interesting to know to what extent education produces a change in fertility among various geographical areas and social categories of the population. In particular, government planners are interested to know whether the peso invested in rural primary schools will go as far as the peso invested in urban primary schools in terms of fertility reduction; or whether a secondary level of education for the general population is necessary; or whether only a primary education is all that is needed to effect a significant decline in fertility. Answers to these and similar questions are important in the formulation of guidelines to efficient allocation of scarce resources to education in relation to other governmental program activities.

The objective of the present study is fivefold: 1) to examine the influence of education on the fertility behavior of currently married women in Misamis Oriental and Southern Leyte provinces, 2) to

determine the magnitude of variations in fertility associated with given changes in educational attainment, 3) to investigate differences in fertility along educational classes between urban and rural areas, 4) to seek an explanation for any observed relation between education and fertility in terms of practice of contraception, and 5) to formulate a set of recommendations with policy implications based on the findings.

#### *Some Relevant Literature*

While studies dealing with the relationship between education and fertility are replete in the literature, very few have actually examined the subject in terms of the relative changes in fertility at given levels of education. One of the first few attempts to do an analysis of this kind occurs in the work of A. Jaffe with the 1955 sample data from the Puerto Rican Bureau of Labour Statistics. His findings indicated that "... at least six and possibly nine years of schooling for women is required before any significant decline in the birth rate occurs..." and that the joint influence of education and labor force participation of women is likely to have a more effective influence on fertility than either factor taken independently (Jaffe, 1959).

Jaffe's interesting hypothesis that at least six years of formal training were needed in order to have a significant decline in fertility was tested later by J. Mayone Stycos in the same Puerto Rican population utilizing data from the 1960 census. Employing a more refined measure of education (no education; primary 1-4, 5-6, and 6-8; secondary 1-4 and 4; and college 1 and above) than that used by Jaffe (zero to 4 years, 5 to 9, and 10 or more years of schooling), Stycos found an accelerating effect of education on fertility with marked differences appearing at the points of completing primary school and high school (Stycos, 1967). Thus, Stycos' findings generally support Jaffe's hypothesis. However, whether the same hypothesis holds true in a different geographical environment and under diverse social and cultural settings appears to

be a question worthy of investigation.

#### *Methodology*

##### *Source of Data*

The present investigation uses data collected in the 1977 round of the Seven Provinces Survey (SPS). The SPS was a joint undertaking among three research institutions – the Population Institute of the University of the Philippines (UPPI), the Office of Population Studies (OPS) of the University of San Carlos, and the Mindanao Center for Population Studies (MCPS) of the Research Institute for Mindanao Culture (RIMCU) of Xavier University – to carry out a study on the fertility trends and family planning behavior of women in the seven provinces of the Philippines which had received special inputs of development assistance from the national government and USAID under the Total Integrated Development Approach (TIDA) program of the Commission on Population.

The study was conducted in the following TIDA provinces:<sup>2</sup> Capiz, Laguna, Misamis Oriental, Negros Oriental, Nueva Ecija, Pangasinan and Southern Leyte.

The Pregnancy History Approach was employed to gather fertility information on the target population, defined as all women 15-54 years of age. Fertility rates were computed for the years 1971-1976 on the basis of the reported pregnancies of all women in the sample. For each pair of provinces in the Visayas-Mindanao area a sample of 4,000 households was selected and a sample of 6,000 households for the three Luzon provinces, or a total of 14,000 households for all seven provinces.

For Misamis Oriental and Southern Leyte provinces, the research sphere of the MCPS-RIMCU in the cooperative endeavor, and from which data of the present reanalysis were obtained, the actual sample consisted of

2,000 Misamis Oriental households and 1,300 Southern Leyte households.

A two-stage P.P.S. cluster probability design was employed to draw the sample using barangays as primary sampling units and households as elements of analysis.

Besides fertility and family planning, several other major variables were obtained during the survey, namely: rural-urban residence, age of women, occupation, education, socioeconomic status, and marriage duration. Fertility of women was measured in terms of crude birth rates, age-specific rates, and total fertility rates. Family planning involved such factors as knowledge, attitudes and practice of contraception. Rural-urban residence was defined as follows: urban-households living in the poblacions of chartered cities, semi-urban households living within the poblacions of municipalities, and rural households living in areas outside the poblacions of chartered cities and municipalities. Information on age was obtained by asking women their age at last birthday. Types of occupation were determined according to specific descriptions of husband's and wife's usual job, and of activities carried out in connection with it. Education was measured in terms of highest grade completed by the wife and her husband at time of interview. Marriage duration was determined through a question on age at marriage.

Finally, eight indicators were developed and weighted to measure socioeconomic status of respondents. These are: occupation of household head, highest grade completed by household head, total number of rooms in household segment of dwelling unit, type of toilet facilities, type of lighting used in household, appliances owned by household, predominant wall materials, and predominant floor materials. Cross-classification techniques and regression equations were employed in the analysis of data.

#### *Adjustments on the Data*

Although a duplicate set of IBM cards was available at the statistical room of RIMCU for use in the analysis, it was necessary to prepare a new set of cards from the original schedules because codes for the education variable were prepared in broad categories which would not allow for the kind of analysis envisioned in the study design.

In addition, while the original plan was to include only currently married women, ages 45 and over, in order to simplify the analysis, the 700 cases identified in this age group was not adequate for cross-tabulation purposes. Performed cross-classifications involving more than two variables had produced zero values in some cells. Thus, it was decided to increase the number of cases by including currently married women ages 30 and over in the sample. This procedure raised the total figure to 2,207 cases.

The inclusion of relatively older women rather than young women in the sample was considered appropriate here because education is one variable that exerts a sustained influence upon fertility over several years. This influence could be reflected more adequately in the educational experience of older women, since they would have representations at each level of the educational continuum. On the other hand, younger women would be expected to be fairly homogeneous in their educational experience which would restrict the anticipated analysis.

For the present study, the following major variables were utilized: fertility, education, rural-urban residence, and practice of family planning. Fertility was measured by the number of children a woman had borne, or cumulative fertility, expressed per thousand currently-married women. Education was operationalized in terms of highest grade completed and classified into: (a) no schooling (b) elementary 1 to 4 and 5 to 7,

(c) high school 1 to 2 and 3 to 4, and (d) college 1 to 2 and 3+. Classification of women by type of residence was based on whether the reported domicile was the poblacion or the central part of the city, in which case, the categorization was urban, and the rest was identified as rural. Finally, practice of family planning was classified in terms of whether or not the woman had ever used one or more methods of contraception.

A more refined measure of education was to classify it by single years of schooling. However, the data did not allow for this kind of measure as several categories of education had zero cases.

Also, while a three-category residential classification was used in the Seven Provinces Survey — urban, semi-urban, and rural — the same categorization was not adopted in the present study, since women living in semi-urban areas (i.e., in municipal poblacions) generally conform more to rural than urban ways of life. These women living in semi-urban places were grouped with rural

women, thereby producing a dichotomous residential classification of urban and rural.

Finally, Southern Leyte, until now, has no chartered cities, therefore, women from this province were all classified as rural.

### Results

Table 1 shows the effect of education on fertility. A pronounced and consistent inverse relationship between education and fertility exists in all categories of education but one. The exception occurs among women with no education, wherein their fertility exceeds those with one to four years of elementary education. However, as will be seen later (in Table 3), the "no education" category includes urban women with unusually low fertility. Though limited in numbers (only five urban women have had no schooling), their fertility is low enough to offset the typically high fertility of rural women and produce an overall fertility average for both urban and rural women with no education lower than that of their counterpart with one to four years of elementary education.

Table 1. *Number of Children Ever Born Per 1,000 Currently Married Women Aged 30 and Over, by Education, Southern Leyte and Misamis Oriental, Philippines, SPS Survey of 1977*

Years of school completed	Number of Women	Children ever born per 1000 women	Percentage change from preceding educational category	Absolute difference from preceding educational category
<i>No schooling</i>	94	7,351	—	—
<i>Elementary:</i>				
1 — 4	550	7,456	+1.4	+105
5 — 7	724	6,587	-11.7	-869
<i>High School:</i>				
1 — 2	241	6,353	-3.5	-234
3 — 4	244	5,488	-13.6	-865
<i>College:</i>				
1 — 2	81	4,963	-9.6	-525
3+	273	3,711	-25.2	-1,252
<b>Total</b>	<b>2,207</b>	<b>6,273</b>	<b>—</b>	<b>—</b>

Nevertheless, the fertility difference between the first two educational categories is noticeably small — .105 of a child per currently married woman.

Excepting the first educational category, the total range in fertility is great. Women with one to four years of education have had twice as many children as those with three or more years of college.

If the fertility difference between the two extreme categories of education (elementary, 1-4 years and college, 3 and over) were evenly distributed over the approximately 15 years of education, it would suggest that every additional year of formal schooling produced about 0.25 fewer number of children per currently married woman, or one child for every four years of education. However, as can be seen in column 5 of the same table, the relative changes in fertility between adjacent educational categories are not evenly distributed. Women who have achieved five to seven years of schooling have 11.7 percent fewer children ever born than those with only one to four years of education. Between the latter category and those with one to two years of secondary education there is only a 3.5 percent reduction in fertility. The same unevenness in relative fertility declines can be seen as one goes along the upper end of the educational continuum.

The effect of education on fertility is further revealed by examining the figures in column four. Substantial declines in fertility are evident at the points of completing elementary school, high school, and especially marked at the college level. For example, women with three or more years of college have borne 1,252 per thousand fewer births than those with only one to two years of college. Fertility reductions for women enrolled at the terminal years of any of the three school levels are comparatively greater than those enrolled in the initial years of these levels.

The inclusion of women who have not completed their childbearing years (30 to 44) could produce some bias in the fertility estimates. In order to control for the age effect, the children ever born rates shown in Table 1 were recomputed in terms of four age groups (30-34, 35-39, 40-44, and 45 and over) for each educational category. The age-specific rates were then standardized using the total population of the seven educational categories as standard population. The results of this operation, together with figures on percentage change and absolute difference, are shown in Table 2.

The relationship between education and fertility remains generally the same after standardization, indicating little effect of age. Except for the first, the rest of the educational categories exhibit a consistently declining fertility with increasing years of completed education. Although the values on absolute difference and percentage change between categories of education have all been affected in different degrees by standardization, their relative importance in terms of effecting a decline in fertility remains virtually the same. Thus, completion of elementary, high school, and particularly college education becomes increasingly important in terms of lowered fertility.

#### *Education, Fertility and Place of Residence*

One important variable to consider in examining the relationship between education and fertility is place of residence. Urban living has been associated with low fertility. This differential has been attributed to different value orientations between the two sub-cultures.<sup>3</sup> In addition, it is a commonplace observation that urban communities have greater proportions of members with higher levels of education than rural communities, thus the need to control for the residence variable.

In Table 3, a two-category residential classification — urban and rural areas — has

Table 2. *Age-Standardized Children Ever Born Per 1,000 Currently Married Women, by Education, Southern Leyte and Misamis Oriental, Philippines, SPS Survey of 1977*

Years of school completed	Age-standardized children ever born	Absolute Difference from preceding educational category	Percentage change from preceding educational category
<i>No schooling</i>	6,985	—	—
<i>Elementary:</i>			
1 - 4	7,292	+307	+4.4
5 - 7	6,710	-582	-8.0
<i>High School:</i>			
1 - 2	6,362	-348	-5.2
3 - 4	5,462	-900	-14.1
<i>College:</i>			
1 - 2	4,976	-486	-8.9
3+	3,930	-1,046	-21.0

been introduced. Measures of children ever born have been computed in unstandardized and age-standardized forms across the seven educational categories.

Fertility in rural areas is characteristically higher than in urban areas. For example, urban women aged 30 and over have borne an average of 908 per thousand fewer children than rural women. However, the positive relationship between urban living and low fertility is only true for women with high school education and below. At the college level, the fertility of rural women is about equal (specifically at the terminal years of college) or lower than their urban counterparts. These patterns are revealed in both unstandardized and age-standardized measures.

This finding seems to suggest that a college education is necessary for rural women to achieve before their fertility can approach or negatively surpass that of urban women. For rural women, any amount of schooling below the college level means maintenance of the

typically higher fertility associated with rural living.

Furthermore, the data indicate marked and virtually consistent declines in fertility with each increment of education within the rural residential area. Within the urban area, a similar inverse pattern is shown in four of the six educational comparisons. However, the inversion shown between the fertility rates of women with no schooling and those with one to four years of elementary education within the urban area can be discounted as only five women represented the "no-education" category.

Again, age does not seem to have a significant effect on the education-fertility relationship, as generally similar patterns of fertility difference exist in both unstandardized and age-standardized rates between educational categories within each area of residence.

As pointed out earlier, an important consideration in this investigation is the

Table 3. *Unstandardized and Age-Standardized Number of Children Ever Born Per 1,000 Currently Married Women, by Education and Residence, Misamis Oriental and Southern Leyte, Philippines, SPS Survey of 1977*

Years of School completed	Unstandardized Rates		Age-Standardized Rates <sup>b</sup>	
	Urban	Rural	Urban	Rural
<i>No schooling</i>	4,600 (5) <sup>a</sup>	7,506 (89) <sup>a</sup>	— — — <sup>c</sup>	7,144
<i>Elementary:</i>				
1 — 4	7,065 (46)	7,300 (503)	6,959	7,055
5 — 7	6,302 (106)	6,636 (618)	6,453	6,742
<i>High School:</i>				
1 — 2	6,158 (76)	6,442 (165)	6,283	6,392
3 — 4	5,026 (76)	5,696 (168)	4,995	5,440
<i>College:</i>				
1 — 2	5,400 (35)	4,630 (46)	5,747	4,802
3+	3,758 (92)	3,687 (182)	4,067	3,863
Mean for all educational categories	5,498	6,406	—	—

<sup>a</sup>Figures in parentheses refer to number of women.

<sup>b</sup>Currently married women in all education categories were used as standard population and age-standardized rates were computed in terms of four age groups: 30-34, 35-39, 40-44 and 45+.

<sup>c</sup>Too few cases to permit calculation of reliable rate.

determination of the effects on fertility of the timing and amounts of urban relative to rural investments in education.

First of all, data in Table 4 indicate the years of schooling at which declines in fertility are relatively substantial within each residential area. For both urban and rural areas, percentage declines in fertility are comparatively substantial during the terminal

years or upon completion of elementary, high school, and college education — the same pattern observed earlier for the total sample.

Secondly, the degree of change in fertility becomes increasingly larger with successive completion or near-completion of the three levels of education. Thus, for urban areas, the following percentage change figures based on

unstandardized rates are shown: elementary 1 to 4 and 5-7 years = -10.8 percent, high school 1 to 2 and 3-4 years = -18.4 percent, and college 1-2 and 3+ years = -30.4 percent. The corresponding figures for rural areas are -9.1

percent, -11.6 percent, and -20.4 percent. Virtually the same pattern of increasing fertility declines appears in the percentage change values based on age-standardized fertility measures.

Table 4. *Percentage Change in Unstandardized and Age-Standardized Number of Children Ever Born Per 1,000 Currently Married Women 30 Years Old and Over Between Successive Educational Categories, by Residence, Misamis Oriental and Southern Leyte, Philippines, SPS Survey of 1977.*

Between educational categories	Percentage change in unstandardized rates		Percentage change in age-standardized rates	
	Urban	Rural	Urban	Rural
0 and 1-4	-- a	-2.7	-- a	-1.2
1-4 and 5-7	-10.8	-9.1	-2.6	-4.4
5-7 and 1-2 high school	-2.3	-2.9	-2.6	-5.2
1-2 and 3-4 high school	-18.4	-11.6	-20.5	-14.9
3-4 high school and 1-2 college	+7.4	-18.7	+15.1	-11.7
1-2 and 3+ college	-30.4	-20.4	-29.2	-19.6

<sup>a</sup>Excluded from the computation in view of the limited number of women with no education (only 5 cases).

Finally, marked declines in fertility at the points of completing elementary, high school, and college levels are more characteristic of urban than rural areas. This is especially true at the college level where fertility of urban areas drop by as much as 10 percentage points greater than that of rural areas.

These findings apparently indicate that relatively large investments in education in both urban and rural areas are necessary before one can expect some noticeable drop in fertility. The fact that fertility differentials accelerate with education, with highest declines occurring only after college is achieved, suggests the long-term effect of education on fertility.

In addition, the data do not support the hypothesis that little or large investments in education have more impact on fertility in the

urban than in the rural areas. First of all, differentials (in terms of percentage declines in fertility) from no schooling up through the first two years of high school are about the same between urban and rural areas. From one to two years of high school and above, the differentials are not clear-cut to favor any particular area of residence. While larger declines in fertility appear in some educational categories in urban areas, the drop in fertility is not consistent, since high school three to four years and college one to two years show a positive rather than a negative change. On the other hand, the declines in rural fertility, while comparatively smaller in some categories, are consistent in pattern. The data seem to indicate then that the effect of urban and rural investments in education on fertility is about the same.

Incidentally, this finding is different from

what Stycos found for Puerto Rico in 1960. His findings showed that:

... modest inputs of education have a negligible impact in rural areas, but a more important effect in urban areas. To summarize, a little education goes a larger way in the urban areas, but a lot of education goes farthest in rural areas (Stycos, 1967).

*The Influence of Family Planning*

An important question to consider in the

analysis of fertility differentials relates to practice of family planning. If women with more years of schooling tend to have fewer number of children than those with lesser amounts of education, is this because that the former practice family planning more frequently than the latter? Also, does urban residence have a positive influence on practice of contraception as commonly found in different cultural settings (Stycos, 1961)?

Table 5 presents the distribution of women who have used one or more methods of contraception by education and residence.

Table 5. *Number and Percent Distribution of Currently Married Women Who Have Used One or More Methods of Contraception, by Education and Residence, Misamis Oriental and Southern Leyte, SPS Survey of 1977*

Educational Attainment	Urban		Rural	
	Number	Percent	Number	Percent
No schooling	1	20.0	20	22.5
<i>Elementary:</i>				
1 - 4	22	47.8	182	36.2
5 - 7	71	67.0	379	61.3
<i>High School:</i>				
1 - 2	59	77.6	150	90.9
3 - 4	73	96.1	132	78.6
<i>College:</i>				
1 - 2	31	88.6	46	100.0
3+	92	100.0	137	75.3
<b>Total ever users</b>	<b>349</b>	<b>80.0</b>	<b>1,046</b>	<b>59.1</b>

At least two specific kinds of information are obtainable from this table. First, regardless of education, family planning practice relates positively to urban residence. Proportionately more women living in urban areas (80 percent) have used one or more methods of contraception than those residing in rural areas (59 percent). However, the positive

relationship between practice of contraception and urban residence is not consistent in all educational categories. In three of the seven categories of education (no schooling, high school 1 to 2 years, and college 1 to 2 years) rural women have relatively higher incidence of contraceptive use than urban women. Apparently, these inversions might have been

produced by the rather massive family planning campaigns launched by the Commission on Population beginning 1972 up to the present particularly in the rural areas of the country. These campaigns could have differentially affected the family planning behavior of specific subgroups of the population.

Second, independent of residence, education is positively associated with practice of family planning. Within the urban areas, lowest levels of contraceptive use are found among women with least schooling, and highest levels of contraceptive use appear among women who have completed three or more years of college or higher education. This positive relationship exists in all educational categories but one.

Except for two inversions (high school 3 to 4 and college 3+), the same positive pattern is observed within the rural areas.

### *Conclusions and Implications*

While some people believe that education can be used as a substitute for family planning in reducing fertility, the findings of the present study seem to suggest otherwise. The

fact that highest declines in fertility occur only at the point of completing college indicates the long-term effect of education on fertility. Government planners adopting the "substitute" policy to reduce the birth rate may wait a long time before finding any positive results of their effort.

However, increased investments in education may be justified for other reasons. One is that education facilitates increased acceptance and practice of family planning in both urban and rural areas. Viewed as an antecedent variable to family planning, education can be a potent force in fertility reduction.

In terms of urban versus rural investments in education, the findings suggest no clear-cut pattern to favor specific areas. The evidence showing lower fertility for rural college women than for urban college women would seem to suggest relatively larger investments in rural areas, since the impact of education on fertility is greater here than in urban areas. In addition, 68 percent of the Philippine population live in rural areas. However, further examination of this point is required as other evidence in the analysis indicates otherwise.

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### *Notes*

<sup>1</sup>Population and family planning concepts are currently integrated into such major subjects as social studies, health, home economics, and mathematics in both primary and secondary levels, and courses in the arts and sciences and teacher training institutions in the college level.

<sup>2</sup>Since 1977, the Seven Provinces Survey has been superseded by the Area Fertility Studies (AFS) in evaluating fertility trends and family planning

prevalence in the country. AFS has regional rather than provincial coverage, and involves the Davao Research and Planning Foundation, Inc., in addition to the original three member institutes, in the research consortium.

<sup>3</sup>W.S. Thompson lists the following values which account for lower fertility in urban areas: negative economic value of children in the city, a desire for social and personal pleasure by the parents, and the relative ease of obtaining contraception and abortion.

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