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**Recent Empirical Findings on Fertility:
Korea, Nigeria,
Tunisia, Venezuela, Philippines**

Occasional Monograph Series
Number Seven



INTERDISCIPLINARY COMMUNICATIONS PROGRAM
Smithsonian Institution

INTERNATIONAL PROGRAM FOR POPULATION ANALYSIS

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ICP Work Agreement Reports

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Foreword

This volume, one of a series of ten occasional monographs, contains some of the results reported by investigators who have studied population-related topics during the past several years as participants in the International Program for Population Analysis (IPPA).

The principal objective of the IPPA has been to broaden the base of knowledge and understanding of population dynamics by generating a new capability in analysis and evaluation, primarily in less developed and developing countries, for use by governments who wish to develop adequate population policies. One of the approaches to this objective has been the offer of modest work agreements (subcontracts) to qualified individuals who wished to work in population dynamics, especially investigators new to the field who were without major professional or financial support from other sources, and who showed promise of emerging as leaders and innovators in the exploration of contemporary population concerns.

At the inception of the Program in 1972, it seemed reasonable to believe that a considerable reservoir of talent had been untapped, that many individual population scholars and other social scientists throughout the world were isolated from the mainstream of knowledge in the field by distance, geography, culture, and lack of established affiliations. It was surmised that these scholars held, or could acquire at modest cost, many of the pieces of the immense puzzle that must ultimately be assembled.

During the past four years, the IPPA has attempted to mobilize some of this dispersed and often neglected talent. Emphasis was placed on goal-directed work oriented toward applications to practical nation- or region-specific population problems. The initiative for individual projects came both from ICP staff suggestions and from investigators' unsolicited proposals.

Proposals from scholars already engaged in population research were given full consideration, but particular attention was paid to applications from

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investigators new to the field but with demonstrated relevant competence, innovative approaches, and promise as nuclei of new population dynamics groups in less-developed and developing countries.

Out of a total of 317 proposals from all over the world, 52 were selected for support by a careful and thorough process which included both internal Interdisciplinary Communications Program (ICP) evaluation and peer review. In each case, a judgment was made as to whether the results would be useful in the formulation of workable Third World population policies and translatable into national commitments to viable action programs. No project was funded for more than \$50,000 - the average was less than \$24,000. Most were for a period of one year or less.

The work agreements were tailored to individual situations, with the hope that a flexible approach would reduce the administrative burden at both ends and still maintain an essential degree of responsiveness. In addition, whenever an investigator undertook work in a country other than his own, it was required that a host country national be involved as a contact and professional collaborator. This requirement was intended to help ensure the relevance and suitability of the study to local conditions, correct interpretations of observations, and the practical application of results.

These investigators were not selected and then left to work in a vacuum. Other elements of the IPPA were designed specifically to maintain communications channels which, by making information from the Program available promptly and in usable form, linked these investigators to each other, to colleagues in related areas, and to the population community at large. These elements included continuous monitoring and assistance by the ICP professional staff and, when appropriate, participation in one or more of the sixteen IPPA workshop seminars, six of which were held in Third World countries. Work agreement investigators, together with others on the IPPA mailing list of more than 4500 names, received semi-annual annotated bibliographies on selected population topics and *Population Dynamics Quarterly (PDQ)*, the IPPA newsletter with worldwide circulation. A number of investigators were first made aware of the IPPA through *PDQ*, and articles by many of them have appeared in its pages.

Even now, as the Program is being concluded, it is difficult to assess accurately the effects of the IPPA experiment—and it was an experiment in the fullest sense of the word. During the past four years, it has been shown that a great deal of unrecognized talent exists, that it can be reached by well-designed techniques, and that it can be productive. New approaches and perceptions have evolved. For example, the increasingly popular concept of population impact analysis grew largely from IPPA's concern with developmental determinants of fertility in selected countries.

Foreword

In compiling this book and its companion volumes, no attempt has been made to reproduce the complete reports submitted by the investigators. To varying degrees, the reports have been edited, condensed, and sometimes rearranged in format. In some instances, highly specialized terminology has been changed to make the material more readable by a diverse and multidisciplinary audience. Hopefully, these editorial liberties--made necessary by constraints of space and money--have not obliterated the essential flavor of the reports or obscured their principal findings. ICP assumes full responsibility for any changes made in the original manuscripts, since stringent time limitations have made it impossible to return the modified versions to the authors for review. Readers who wish additional information on any of these reports are encouraged to contact the authors directly.

Four years is a short time in which to devise and implement an undertaking of this diversity, let alone evaluate its long-term contribution to the solution of a problem of such magnitude. We hope the contents of this volume and the others in this series will be interesting and informative to a wide variety of readers with eclectic viewpoints. More importantly, we hope these first efforts will serve as a pattern and a source of encouragement for future efforts, and that the network of interpersonal contacts which has been established will continue to flourish.

M. C. Shelesnyak

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Introduction

The relationship of various socioeconomic factors to fertility in selected areas of five nations on three continents is the dominant theme of this monograph. Information in all reports is taken from survey or census data. Among the independent variables considered by the investigators for their possible effect on fertility are the number of children; influence of husband; male and female employment; occupation; education; childcare arrangements; and economic conditions of the household. One study focuses on breastfeeding (generally accepted as a major fertility determinant) although the study does not contain an analysis of its interrelationship with fertility.

Aware that a large number of women entered the Korean labor force during the economic transition of the 1960s, Lee and Cho use 1970 Korean census data to determine if, on the one hand, fertility in Korea is restricted by female employment and, on the other hand, if female employment is limited by childbearing and childrearing. Like a number of other investigators in this monograph, they are also interested in ascertaining the impact of tradition on family size and jobs outside the home.

Arowolo, in turn, asks the question, At what point in modernization does a decrease in fertility occur? He speculates that modern methods of fertility regulation can be used, and used effectively, without bringing about a fertility decline—that is, contraception can serve to space the desired number of pregnancies rather than to cut down on family size. He undertakes a questionnaire survey of Yoruban households in rural and urban areas of southwestern Nigeria to determine the impact of socioeconomic and life history variables on the fertility of Yoruba women. The investigator's major concern is to provide a data base for estimating the future fertility of this high fertility region.

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Another survey—this one on women, employment, and contraceptive practice in four Caracas barrios—is based on the hypothesis that married women employed outside the home are more interested than other housewives in preventing pregnancy because they want to continue working. Bamberger, del Negro, and Gamble also hypothesize that these women are better able to continue working because they have better access to and information about contraception.

A 1975 re-interview of Lunisian working men and women provides Suzman, Miller, and Charad with information on whether job satisfaction causes men and women in the urban labor force to set aside the traditional cultural norm for having large families. The aim of the investigators is to find out whether (and when) the work role takes on greater importance than raising children if it offers such psychological returns to the adults as status, achievement, and social utility.

The economic rewards and costs of having children are the concern of Boulier who builds on much previous research in this area. Focusing on Laguna province in the Philippines, the investigator makes detailed estimates of the time and income contributions of family members for all survey households, including farm and nonfarm families, in an attempt to determine the economic effect of having children.

The determinants of breastfeeding, a traditional fertility variable, is analyzed by Popkin and de Jesus in terms of economic, demographic, and preference parameters. Of particular importance to this analysis of a survey also conducted in Laguna is an analysis of the compatibility of a mother's job with breastfeeding and the effect of milk company persuasions on such behavior.

Interesting to note is that most of these studies find unexpected relationships between fertility and other variables. As many of the authors point out, a complex set of factors, not just one individual factor, brings about fertility decline. Not only must a society have "technological" modernity (indeed, some studies show that the presence of modern technology has no effect), but a society must also be modern in its perceptions of family size to bring about a decline in natality. Such modernity is difficult to bring about, given the lag time that a society needs to adjust to new technologies. The analyses in this monograph should provide new insights into these complex problems.

Fertility and Women's Labor Force Participation in Korea

Lee Hyo-Chai
Cho Hyoung

Abstract

This study involved analysis of demographic characteristics of the Korean female population with special attention directed to measurement of interrelationships among their age, marital status, fertility, labor force participation, and educational and residential characteristics. Principal data were derived from a 1 percent sample of the 1970 Korean census provided by the Bureau of Statistics of the Korean Government. Investigators found an inverse relationship between women's educational attainment and fertility and observed that although female labor force participation rates are higher in Korea's rural areas, urban women demonstrated consistently lower fertility.

During the decade, 1960-1970, Korea underwent rapid economic growth and demographic change. Some characteristics of these changes are highlighted in this report with special reference to women's labor force participation and fertility behavior. The investigators examined to what extent women have differential fertility and identified the most important factors affecting their fertility behavior. One of the aims in this study was to identify socioeconomic factors associated with marital fertility of Korean women.

The study was not geared to measure the contribution of women to economic development through participation in the labor force and reduction of

Note: ICP social scientist Roy H. Haas helped prepare this report for publication. Correspondence to Professor Lee may be directed to Department of Sociology, Ehwa Womans University, Seoul, Korea.

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fertility. The primary interest was in the nature of the demographic transition and the decline of fertility, particularly in Korea.

A considerable decline in fertility occurred in Korea during the 1960s. Between the census years 1960 and 1970, there was a 34.5 percent decline in the TFR (total fertility rate) of all Korean women. The overall decline was greater in urban areas than in rural ones, 35.5 percent and 29.9 percent, respectively.

The decline of fertility in both urban and rural areas during the decade was largely due to the rapid change in fertility levels in the first half of the 1960s. Certainly, most of the fertility reduction among urban women is attributed to the decline in that period.

Between 1966-1970, the urban TFR did not change much. But the rural TFR dropped steadily, resulting in a narrowing of the gap between urban and rural fertility. Whereas in 1966 rural fertility was 69 percent higher than urban, it was only 37 percent higher in 1970. Nevertheless, this differential was still wider than in 1960 when it was only 26 percent greater in the rural areas.

The three major demographic changes to which a decline in the overall fertility rate can be attributed are: Change in age-sex structure of the population, change in women's marital status, and change in marital fertility. According to Lee-Jay Cho (1973), the age-sex structure of Korean population, 15 years old and over, remained relatively stable over the 1960s and contributed least—about 10 percent—to decline in the overall fertility level. About 30 percent of the decline is attributed to changes in the proportion of married women in reproductive ages, and about 60 percent to the actual reduction in fertility among married women, especially those 35 and older.

All these demographic changes which effected the overall fertility decline were accompanied by various socioeconomic changes accelerating since the early 1960s. Rapid economic growth, urbanization, a national family planning program, and increased female participation in the labor force are changes suspected of exerting impact on women's age at marriage and marital fertility.

Women's labor participation is related to fertility behavior. From a policy point of view, the active participation of women in the economic sector is believed to assist national family planning programs in recruiting acceptors. It has been argued that fertility and women's labor force participation are negatively related: As the economy develops, women's nonfamilial roles increase, tending to reduce fertility (Gendell 1967, Kasarda 1971). On the other hand, fertility itself limits the participation of women in the labor force.

A dramatic change in the size of the labor force in Korea occurred in the 1960s. The economically active population increased from 7.5 million in 1960

Fertility and Women's Labor Force Participation in Korea

to over 10 million in 1970, a growth of 37.6 percent in 10 years. Women accounted for a considerable part of this gain. The 1.6 million increase in the women's labor force made up 51.8 percent of the total labor force increase (Table 1).

The growing economically active population meant an increase in the economic activity rate.* In 1960, the economic activity rate was 49.0 per-

Table 1
Economically Active Population and Economic Activity Rates 1960-1970

Year	Economically Active Population			Economic Activity Rates (%)		
	Both Sexes	Male	Female	Both Sexes	Male	Female
<i>All Korea</i>						
1960 ^a	7,543,060	5,386,910	2,156,150	49.0	74.4	26.8
1966 ^b	8,654,350	5,974,730	2,679,620	53.7	78.6	31.5
1970 ^b	10,377,512	6,752,595 ^c	3,624,717	54.8	72.5 ^c	37.6
<i>Urban</i>						
1960 ^a	1,842,940	1,390,125	452,815	41.6	66.0	19.4
1966 ^b	2,833,460	2,087,560	745,900	49.5	77.6	24.6
1970 ^b	3,922,927	2,821,594 ^c	1,101,333	47.0	68.1 ^c	26.0
<i>Rural</i>						
1960 ^a	5,700,120	3,996,785	1,703,335	52.1	76.5	29.8
1966 ^b	5,820,890	3,887,170	1,933,720	56.1	79.1	35.4
1970 ^b	6,454,586	3,931,001 ^c	2,523,585	69.4	75.5 ^c	46.8

^aThe economically active population in the 1960 census are the population of ages 13 and over, as counted in the traditional way, who were in the labor force.

^bThe lowest age limit of the economically active age in the 1966 and 1970 censuses was 14, the complete years of age.

^cIn the 1970 census the economic status of over 600,000 men mostly in the early 20's are categorized as "unknown." They are presumably in military service. If we count them in the labor force, the economic activity rates are raised to 79.0 percent in all Korea, 74.8 percent in urban areas, and 81.8 percent in rural areas.

Source: Economic Planning Board, Bureau of Statistics, *1960 Population and Housing Census of Korea*, Vol. 1, *1966 Population Census Report of Korea*, 12-1, *1970, Population and Housing Census Report*, Vol. 1 and Vol. 2.

*(Expressed as the proportion of the population in the labor force to the total population in the economically active ages, for example, 14 and over).

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cent; it rose to 54.8 percent in 1970. The economic activity rate for women was lower than that for men in 1970, 37.6 and 72.5 percent, respectively. In 1970, 35.2 percent of the entire economically active population was female.

The increase in employment of both men and women was more prominent in urban areas. However, women's employment also increased considerably in rural areas, and in 1970 the female activity rate in urban areas was still lower than in rural areas, 26.0 percent and 46.8 percent, respectively.

The higher activity rate in rural areas implies that the labor-intensive agricultural sector is still economically dominant in Korea, although the proportion of the labor force in agriculture has been declining over the past few decades. In 1970, 50.7 percent of the total employed were in the primary industrial sector, with the majority in agriculture, 21.7 percent were in production, and other types of work in the secondary sector, and about 28 percent scattered among other jobs. Of the total women in the labor force, 59.7 percent were employed in the primary sector, 14.7 percent in the secondary, and about 25 percent in the tertiary sector (Table 2).

Korean census data available for the years 1960, 1966, and 1970 show a negative relationship between fertility levels and degrees of women's labor

*"Employed" refers to persons among the economically active population who worked during the week previous to the census date.

Table 2
The Proportional Distribution and the Percentage Female
of the Employed Population by Sex and by Occupation, 1970

Occupation	Total	Male	Female	Percent Female
Professional	3.2	3.8	2.1	22.8
Managerial	0.9	1.4	0.1	3.5
Clerical	5.9	7.5	2.8	17.0
Sales	10.1	10.4	9.6	33.4
Service	6.7	4.5	10.8	56.8
Agriculture, Fishery, and Forestry	50.7	45.8	59.7	41.5
Production	21.7	25.4	14.7	24.0
Not classifiable	0.8	1.1	0.2	6.8
Unknown	0.1	0.1	0.1	20.5
Total	100.1	100.0	100.1	35.2

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force participation. However, this apparent relationship between the overall rates does not explain the nature of causal sequence, if any, of the relationship. Nor does it take into account other socioeconomic factors affecting the relationship of fertility and women's labor force participation.

METHODOLOGY

This report is a result of an in-depth analysis of the 1970 Census outputs. Special tabulations were prepared from the data of a 1 percent sample household survey.

There are three types of questions from which a woman's fertility experience can be inferred: The number of children ever born to a woman 15 years old or over, the number of living children, and a listing of all household members identified by their relationship to the household head (from this, the number of young children living with mother—own children—is identifiable).

Two measures of fertility are directly computable from the census outputs. One is the average number of children ever born per ever-married woman 15 and over; the other is the average number of own children under 5 per ever-married woman in reproductive ages, 15-49.

The first measure computed for each age group reflects the actual cumulative fertility rate of the age cohort, which, for women 50 and over, is assumed to be completed family size. Usually, cumulative fertility up to age 50 or so is expected to increase with age. However, accurate fertility reporting is questionable, especially among older women who bore children long ago. Therefore, completed fertility is measured for women who recently passed the childbearing period, 50-54. Since the fertility of women who died or emigrated before the census date is not included, the measure is biased to the extent that it does not account for the difference between their fertility and other women.

The second measure, the average number of own children under 5 per married woman 15-49, can serve as a proxy for current fertility since it counts surviving children living with mothers. Since the mortality of young children and women is already known through vital events registration, the measure reflects effective-fertility over the past five years. Although children who do not live with mother are excluded, this factor is of little significance compared to the mortality effect because only 0.7 percent of children under 5 are separated from their mothers.

Despite the weaknesses in the two measures, they were considered sufficient for examining the overall fertility trends among Korean women and for comparing differential fertilities among ever-married women in various circumstances.

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The demographic and socioeconomic characteristics considered in this analysis of fertility behavior are: Age, place of residence, level of educational attainment, status of labor force participation, and, if employed, type of economic activity. The possible effects of these characteristics upon fertility are measured by comparing fertility differentials among different categories of women.

FACTORS ASSOCIATED WITH FERTILITY

In this section, we examine the pattern of marital fertility in relation to age, urbanization, and education—the most frequently identified causes of differential fertility. A study of marital fertility differentials according to age shows the effect of women's age on their current and past fertility behavior.

Age

A woman has a limited period of reproduction during her lifetime, and her childbearing does not occur uniformly over this reproductive period. Age-to-age variations occur in the fertility behavior.

Table 3 presents the cumulative fertility rates and the current effective

Table 3
Number of Children for Korean Women by Age, 1970

Ages	Average Number of Children Ever Born			Number of Own Children Under Age 5 to Women 15-49		
	All Korea	Urban	Rural	All Korea	Urban	Rural
15-19	0.51	0.46	0.53	0.41	0.35	0.44
20-24	1.03	0.92	1.13	0.87	0.78	0.95
25-29	2.15	1.85	2.44	1.38	1.25	1.50
30-34	3.54	3.08	3.91	1.20	1.05	1.32
35-39	4.55	3.95	4.98	0.73	0.51	0.88
40-44	5.29	4.63	5.71	0.39	0.21	0.50
45-49	5.63	5.02	5.98	0.12	0.06	0.15
50-54	5.65	5.18	5.89	—	—	—
55-59	5.42	5.06	5.59	—	—	—
60 and over	5.02	4.75	5.14	—	—	—
Total	4.15	3.52	4.57	0.839	0.737	0.917
Total Standardized for Age		3.72	4.44		0.697	0.949

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fertility levels for Korea in 1970. For the entire country, the average completed family size is 5.65, compared to the TFR which is only 3.94. Thus, the completed fertility of a *real* cohort, ages 50-54, outnumbered the TFR by 1.71.

Table 3 also shows that the average number of children ever born (cumulative fertility) per woman increases with age, although older women perhaps forget children born long ago and this contributes to their completed family size diminishing.

The second column in Table 3 shows that married women of reproductive age have, on the average, 0.84 children under 5 years of age at home. This is the average effective fertility level of ever-married women, ages 15-49, during the five years, 1965-1970. The number of own children is largest for women in the 25-29 age group (1.38), followed by those in the 30-34 age group (1.20).

Place of Residence

In most developing countries, a fertility differential exists between urban and rural areas, with urban areas exhibiting lower fertility. Modern facilities and urban ways of life are closely related to family income, time allocated to various activities, and the educational levels of family members. All these factors tend to affect decisions on family size.*

In this respect, cumulative fertility, which reflects past fertility experiences, may not be an adequate measure of fertility differential. Current fertility is a more accurate reflection of the fertility differential between different types of residential areas. However, we will start with a comparison of cumulative and completed fertility of women residing in urban and rural areas and then move to an examination of current fertility.

Table 3 indicates that the average number of children ever born to women 15 and over is 3.52 for urban women and 4.57 for rural women—a 1.05 difference. Thus, ever-married women in urban areas have borne, on the average, about one child less than their rural counterparts. This difference is partly the effect of the different age structures of ever-married women in urban and rural areas. However, there still remain urban-rural differences in fertility after controlling for the effect of age structure. Indeed, when fertility among urban and rural women is standardized on the age structure of total ever-married women, the figures become 3.72 and 4.44, respectively, a difference of 0.72.

*In comparing fertility behavior of urban and rural women, the place where the women were raised, or spent most of their lives, may be of more relevance than present residences. However, since existing data on the fertility of urban and rural women ignore past migration experience, such a comparison is not possible.

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A fertility differential between urban and rural areas also shows up in completed family size: Rural women ages 50-54 have a completed fertility rate of 5.89, while urban women in the same age cohort have borne 5.18 children. Furthermore, urban residents show lower cumulative fertility rates at all ages than do rural women, although the difference varies. The urban-rural gap is slight for the very young, widens until ages 40-44, and then diminishes again. The generally lower completed fertility level of women over 50, which reduces the gap, can be attributed to two factors: One is reporting error—the questionable accuracy of fertility experience reported by older women. Such distortion is probably more prevalent in rural than in urban areas. Second, if we assume that urban and rural women have the same degree of reporting error, the narrowing gap between urban and rural cumulative fertility for older women may be because urban women continue their childbearing longer than most rural women. Perhaps, too, a significant number of urban older women completed their families in a rural milieu, thus confounding the rural-urban differential.

It has been mentioned that the number of children under 5 per ever-married woman 15-49 is a more appropriate measure than average number of children ever-born for understanding the fertility behavior of urban and rural residents. Table 3 shows that this current effective fertility rate is 0.74 for urban women and 0.92 for rural women. These figures become 0.70 and 0.95, respectively, when the effect of age structure is removed, leaving a difference of 0.25. Again, current fertility is lower for urban women.

Both urban and rural residents show similarity in the age pattern of fertility behavior, although rural women at all ages have higher fertility rates than urban women. Both urban and rural women, 25-34, have more young children than those in any other age groups. This implies that actual fertility is highest in the 20s and early 30s.

In short, we have noted fertility differentials between urban and rural areas. Since fertility experience was related to the present place of residence, the effect of migration upon fertility was not included. However, the overall pattern shows that rural women have higher current fertility than urban women at all ages. This is also shown in their past experience, for example, in the cumulative fertility rates of all five-year age cohorts and the completed family size of older cohorts. The remaining difference can be attributed to other social, economic, and cultural factors.

Education

Literacy is relatively high among Korean women. About 32 percent of the women have had no formal education, but most of those who cannot read (less than 20 percent) are concentrated in the older age groups. Younger

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women tend to have more education. Since 1945, elementary education has been compulsory and 43.1 percent of all women have had a primary education. While there is little difference between rural and urban areas in the percentage of women with primary education, the difference widens above the elementary education level. In urban areas there are more opportunities for women to attain higher education and more women who can afford to do so.

Table 4 indicates fertility differentials by level of educational attainment, standardized on the age structure of the total ever-married women in Korea. Age standardization is particularly important here. Since education and age are closely associated, the median age of women with different educational levels varies, as does their average level of current and cumulative fertility. For example, the median age of the ever-married women with no formal education is 52.5. This means that over half of these women have already completed their childbearing years. The median age is 34.0 for women with some primary education, 31.2 for those with some secondary education, and 30.7 for those with some college and/or higher education.

Table 4 shows an inverse relationship between level of educational attainment and fertility after standardizing for age. As educational level rises, the average cumulative fertility rate diminishes in both urban and rural areas. Again, when educational level is controlled, urban women show a lower level of fertility than rural women. The urban-rural difference in fertility at all educational levels indicates that the effects of urbanization, other than age structure and education, intervene to affect women's fertility behavior. The relative difference in the fertility rates of two contiguous educa-

Table 4
Fertility for Ever-Married Women by the Level of Educational Attainment
(Standardized by Age)

Level of Education	Average Number of Children Ever Born			Completed Family Size Women 50-54		
	All Korea	Urban	Rural	All Korea	Urban	Rural
None	4.43	4.00	4.70	5.89	5.25	6.26
Elementary	4.08	3.82	4.35	5.43	5.16	5.82
Secondary	3.50	3.48	3.75	4.79	4.99	5.12
College or More	2.93	2.43	3.17	4.46	4.35	5.41
Total	4.15	3.72	4.44	5.65	5.18	5.98

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tional levels increases for higher educational levels. The fertility rates are lowered by 7.9 per cent, 14.2 percent, and 16.3 percent by an increase of one educational level. On the whole, the influence of secondary education upon women's fertility behavior is almost two times larger than the effect of elementary education. College education is also a strong factor in reducing women's fertility behavior: The average cumulative fertility of women with college education is 16.2 percent lower than for women with secondary education, and 33.9 percent lower than for women with no formal education.

The urban and rural fertility differential reveals a somewhat different view of the effect of educational levels. College education seems to have a greater impact on reducing fertility in urban areas. Elementary and secondary education are more effective in rural areas than in urban ones. However, the average cumulative fertility level of urban women with no formal education is lower than that of rural women with elementary and secondary education.

Completed family size of women with varying degrees of educational attainment also reflects the effect of education. In all age groups, women with less education show a larger completed family size. The highest fertility rates reported by older women ages 50-54 varies from 4.46 to 5.89 according to the educational level after standardized for age (Table 4). Urban women have borne less children than rural women when the level of education is fixed. In addition, the average completed family size of urban residents with no formal education is smaller than rural residents with no, or only primary, education.

The relative difference in the completed fertility rate of women increases at each successive level of education. This pattern is maintained except for the difference between rural women with secondary education and those with college education: The latter have a higher completed fertility rate than the former. Whether this is an actual deviation from the general pattern or due to statistical error should be ascertained.

Current fertility shows a similar pattern in respect to the effect of education. The current effective fertility is, in general, inversely related to the level of women's educational attainment. However, while there seems to be a remarkable difference in current fertility between women with primary education and those with secondary education, there exists little difference between women with secondary education and those with college education, after controlling for age. The powerful impact of secondary education upon women's fertility behavior is almost comparable to the effect of college education. This is in part a result of differing patterns in rural and urban areas: Contrary to the findings, in rural areas current fertility is lower for college educated women than for women with secondary education. The reverse is true in urban areas.

The apparent contradictions can be attributed to differing fertility behav-

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ior of women currently in reproductive ages and those who have passed childbearing. The fertility behavior of older women as reflected in the completed fertility rate reveals that a college education was more important than a secondary education in reducing urban family size. Among rural women, however, college education had no more impact upon fertility than did secondary education. The fertility behavior of women currently in reproductive ages shows that college educated women in urban areas tend to postpone their childbearing, but, by the end of their reproductive period, have as many children as do women with secondary educations. In rural areas, however, college education tends to further reduce the fertility level of women with secondary education.

So far we have examined the relationship between women's educational level and fertility by comparing differential rates of cumulative, completed, and current effective fertility. On the whole, they are negatively related, suggesting that women's education is a reductive factor on fertility. However, it has not been determined which aspects of the educational experience or which intervening variables—employment, marriage pattern, mortality rates—contribute to the negative correlation.

Some secondary schooling seems to make significant differences in fertility levels. However, above this educational level, there appears to be a mixed pattern of influence depending upon the place of residence. This may be partly due to the difference in the ages of women with some college education from those with less schooling, factors affected by other aspects of urban and rural ways of life.

It was also noted that the fertility of urban women is consistently lower than that of their rural counterparts when the levels of education were controlled. This may prove that the effects of women's education upon fertility have more impact when combined with other aspects of urbanization.

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Koreans believe that a woman's place is at home with her family. Many women do not engage in any economic activity outside the home, while others give up their outside work to become full-time wives. Still others must reconcile demands of work with those of housework and childcare.

Since the demands of being a wife, mother, and worker are contradictory in many ways, they are believed to be negatively related. However, this hypothetical negative relationship between a woman's economic participation and fertility does not always hold true. There are varying opinions concerning the existence and nature of this relationship. It has been recognized that in developed countries a negative relationship exists between fertility and female labor force participation, although the direction of the

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causal relationship has not been established (UN 1973).

Some authors suggest that a certain level of economic development creates a relationship between fertility and female labor force participation (Gendell 1967). However, data on developing societies reveal inconsistencies that make any generalizations about this interrelationship difficult. For example, in a study concerning this relationship in Thailand, Goldstein (1972) concludes that "it may not be labor force participation per se, but a series of other variables associated with labor force participation" that affect women's fertility. Concerning the effect of fertility upon women's labor force participation in the non-agricultural sector of developing countries, Youssef (1974) concludes that the supply of women available to the labor market is not merely a function of family characteristics including fertility rates. Instead she claims that it is the interaction of such variables with the social organization that determines the contribution of women for non-agricultural economic activity. These authors suggest that it is difficult to generalize about the relationship between fertility and women's labor force participation for developing societies because it largely depends on intervening social and cultural variables.

Finding no differences in fertility by labor force status among Turkish women, Stycos and Weller (1967) developed the concept of role compatibility and designed a hypothetical matrix defining the relationship of fertility to female employment under varying societal conditions. They chose compatibility of mother-worker roles and availability of contraceptive devices as two controlling factors which determine the existence and direction of a relationship between fertility and women's labor force participation.

The notion of role compatibility seems useful for considering the relationship. According to the hypothesis in which the roles of mother, wife and worker are compatible, there should be little relation between labor force participation and fertility. Compatibility emerges from the nature of work and the social organization around childcare. On the other hand, when the roles of mother and worker are relatively incompatible, a relationship emerges. The direction of the relationship will depend on the availability of contraceptive technology: Where birth control is available, employment tends to reduce fertility; where it is not, fertility tends to limit employment (Stycos and Weller 1967).

Of course, this is not to claim that their model is complete. Availability of birth control devices cannot be the only other factor interacting with role compatibility to affect the relationship between fertility and labor force participation. For example, the tensions between employment and fertility may be relatively eased when extended family or domestic service are available for childcare and housework. However, role compatibility has been proven a very useful concept in many Latin American and South Asian countries

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because it suggests that the type of work, rather than women's labor force participation per se, is related to fertility.

It is our purpose to explore the data to find whether there is a relationship between fertility and women's labor force participation in Korea, and, if there is, in what direction and to what extent such a relationship holds. We will first review the structural characteristics of the female labor force and identify the types of work they do. In the following sections we will examine the relationship of fertility with women's participation in economic activities of various types.

Structure of the Female Labor Force

As indicated, economic transition in the 1960s induced a large number of women to enter the labor market. It was pointed out that women accounted for 51.8 percent of the increase in the total labor force during the decade. The female share also increased from 28.6 percent in 1960 to 34.9 percent in 1970, while the female economic activity rate rose from 26.8 percent to 37.6 percent. This means that in 1970 more than 37 women out of 100 women ages 14 and over were in the labor force.

Between urban and rural areas there appears to be a remarkable difference in the level of women's labor force participation. In rural areas women's participation is much higher than in urban areas: The female labor force participation rates in 1970 were 46.7 percent and 25.0 percent, respectively. The high rate of participation in rural areas is largely due to increasing opportunities in agricultural work for women. Although the agricultural sector is still dominated by male workers, female workers have begun replacing them.

During the 1960s over 730,000 women entered agricultural occupations. The proportion of females among agricultural workers was 30.3 percent in 1960, but increased to 41.5 percent in 1970. The increase in the female share of the agricultural labor force can be attributed to two factors. One is that rural women take over agricultural labor when men leave for urban areas or other non-agricultural jobs. The exodus of rural men and the entrance of more rural women into the labor force have been trends in Korean rural economy since the 1930s (Kwon et al 1975). The second reason may be that in farming areas anyone willing to work can find some type of job, although it may be non-paying. As indicated in Table 5, 52.1 percent of the female labor force are unpaid family workers.

Besides the agricultural occupations filled by women during the past decade, more than 380,000 women entered the modern and traditional manufacturing industries, mostly as production workers needing little or no skills. Sales and service related occupations also added about 330,000 women workers.

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The occupational structure of the female labor force, as categorized by occupational status in Table 5A, 5B, implies that the numerical increase in working women during the 1960s did not produce any significant improvement in their working status. Most of the women in the labor force entered and remained at the lowest rung of the occupational hierarchy, working in agricultural, production, sales or service jobs requiring few high level skills. Over half of the total female labor force are working as unpaid family workers, mostly in agricultural jobs. Among self-employed workers, one-half work in agriculture, substituting for men in the family production units. Whether they are self-employed or family workers, "the position of women in agriculture has been, and is still, that of subordination" in Korea (Kwon et al 1975).

Table 5A & B
The Proportional Distribution of the Female Labor Force
by Occupation and Employment Status, 1970

Occupation	Employment Status			Employed	Total
	Self-Employed	Employer	Family Workers		
Total Female Labor Force (A)					
Professional	0.2	—	—	1.8	2.0
Managerial	0.1	—	—	0.0	0.1
Clerical	0.0	—	—	2.7	2.7
Sales	4.8	0.1	3.2	0.2	8.3
Service	1.6	0.4	0.8	8.2	11.0
Agriculture	8.6	0.1	45.9	5.0	59.6
Production	1.4	0.4	2.0	10.9	14.7
Other	—	—	0.2	1.4	1.6
Total	16.7	1.0	52.1	30.2	100.0
Ever-Married Women Workers (B)					
Professional	0.2	—	0.1	1.0	1.3
Managerial	0.1	—	—	—	0.1
Clerical	—	—	—	0.5	0.5
Sales	6.6	0.1	4.2	1.2	12.1
Service	2.2	0.4	0.9	2.5	6.0
Agriculture	11.9	0.1	54.7	6.1	72.8
Production	1.6	0.2	2.0	3.4	7.2
Total	22.5	0.8	62.0	14.7	100.0

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In terms of role compatibility, most of the self-employed and family workers are engaged in types of work where the pressures are not as acute as in non-agricultural sector jobs.

It is worthwhile to examine the occupational status of ever-married women workers to view the types of work in which they are engaged (Table 5B). Comparing the occupational characteristics of all female workers, the proportion of agricultural family workers and self-employed workers is, in general, greater among ever-married workers than among workers employed by others. This suggests that family workers and self-employed women in agricultural or sales jobs (which require no specific skills and are relatively accessible to rural and less educated people) find this work less incompatible than other types of employment.

This brief examination of the occupational structure of the female labor force suggests that women are heavily concentrated in those types of jobs compatible with their family role. This is especially true of ever-married female workers. Therefore, female employment may not affect fertility. Since this discussion does not preclude such a relationship, and since female workers are also found in other types of work, the question of whether there is a relationship between fertility and female labor force participation in different types of work with regard to role compatibility remains to be interpreted.

Women's Labor Force Participation as a Factor Affecting Fertility

We will now consider to what extent fertility varies according to work status of women. We will compare fertility differential between working and non-working women and among ever-married women in various types of work.

It may be more appropriate to relate work status of women with their current fertility in order to examine influence of employment upon fertility level. The current effective fertility of women in reproductive ages is lower among those who are working than those who are not. On the national level, a woman in the labor force has on the average 0.81 children under 5, while a housewife has 0.96 children. However, this apparently lower fertility among working women is mainly due to the age structure which has a lowering effect upon the average fertility. The specific fertility levels are higher for working women at all ages than for housewives. Thus, when the age effect is controlled, it turns out that a working woman would have more children under 5 than a non-working woman, 0.89 and 0.81, respectively.

This lack of relationship between women's employment and fertility largely reflects the pattern in rural areas. In urban areas, on the contrary,

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women in the labor force show lower current fertility at all ages than non-working women. In other words, engagement in work in urban areas seems to reduce the fertility level, while in rural areas, women's work seems to encourage fertility.

The influence of women's employment upon fertility is more apparent in fertility differential among women in different types of occupations. As indicated in Table 6, women in all occupations except agricultural have a smaller number of children under 5 than the national average of 0.84, while women workers in agricultural jobs show a higher-than-average fertility level. This is true in both urban and rural areas.

Among non-agricultural occupations, employment in service and clerical work tends to have the most effect upon lowering fertility levels in both urban and rural areas. Professional and managerial jobs also tend to have similar effects upon fertility, although to a lesser degree. Sales workers show a higher fertility than other non-agricultural workers. Production workers have differential fertility behavior depending on the place of work, for example, urban or rural areas. Those working in rural areas have a much higher level of fertility than those in urban areas.

The fertility differential among women in different occupations suggests that those jobs which are more modern and urban, requiring relatively high levels of education and technical skills, tend to have a stronger limiting influence upon fertility. This is also supported by fertility differentials among women in varying employment status.

Table 6
Number of Children per Ever-Married Women by Occupation
(Standardized by Age)

Occupation	Average Number of Children Ever Born			Number of Own Children Under Age 5		
	All Korea	Urban	Rural	All Korea	Urban	Rural
Professional	3.21	2.87	3.73	0.63	0.61	0.67
Managerial	2.31	1.59	2.55	0.55	0.50	0.79
Clerical	2.30	2.24	2.67	0.45	0.43	0.51
Sales	3.80	3.63	4.07	0.71	0.65	0.81
Service	3.10	3.00	3.41	0.37	0.31	0.53
Agricultural	4.61	4.20	4.63	1.00	0.86	1.01
Production	3.90	3.32	4.37	0.69	0.48	0.87

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Unpaid family workers have the highest fertility rate in both urban and rural areas. Although somewhat lower, self-employed workers also show a high level of fertility. As was seen in Table 5B, more than one-half of all self-employed ever-married females and almost 90 percent of family workers are in agriculture. On the other hand, the fertility levels of women employers and employed workers are rather low. The urban employed workers, especially in service, sales, and production jobs, show the lowest fertility levels.

The examination of the effect of women's labor force participation upon fertility level has shown that a negative correlation exists between them only in some non-agricultural occupations. However, there still remain a few questions to be considered. First, women's employment in relatively incompatible types of work is closely related to educational requirements and job opportunities which are concentrated in urban areas. The educational and employment factors are difficult to separate in such cases. Moreover, the proportion of women whose fertility behavior may be affected by employment is small. There are not many married women workers who, because they are working, feel pressed to reduce fertility. A much larger proportion of working women are in the other types of work.

If we accept these findings on the relationship of women's labor force participation to fertility as indications of the effect of work on fertility, we have to explain the higher rate of fertility among agricultural workers. Would agricultural employment have encouraged higher fertility? A sense of labor shortage may have encouraged agricultural workers to have many children. However, evidence shows that rural fertility rates have been declining over the past decade and that this is due to the reduction of fertility among the farming population. Thus, the question should be seen from the other side. In this case, it seems more viable that higher fertility may have pressed women to seek economic activity.

Fertility as Determinant of Women's Labor Force Participation

Our primary concern here is to examine the possible effects of fertility upon mother's employment. In previous sections, it was suggested that fertility seemed related to women's employment in some types of work, but that women's labor participation might be more often determined by fertility rather than be an influence on it. We will also consider other demographic and social factors to compare the effect of fertility with that of other variables.

Women's labor force participation is related to a complex set of social and economic factors either inducing women into the labor force or limiting their propensity to work outside the home. Different groups of women face dif-

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ferent sets of needs, opportunities, qualifications, and personal familial conditions, so that their labor force participation varies accordingly.

Women's labor force participation rate varies according to age. The age-specific rates vary from 31.41 percent (25-29) to 48.45 percent (45-49), among the age groups under 60.

Age-to-age variation in women's labor force participation rates is frequently translated into a pattern of women's work life-cycle,* the well-known "two-phase" work life-cycle, or the "M" curve (Ostry 1968, OECD 1975). Thus, the participation rate in the early ages is relatively high, rising until the mid-20s, and then dropping in the late 20s and early 30s when most women marry and have children. The rate begins to rise again, forming another peak in the late 40s or early 50s. The degree of the age-to-age variation varies from country to country, but the graphs of age-specific participation rates more or less produce an "M" curve.

In Korea the variation in the age-specific participation rates follows a different pattern among urban and rural women. Although rural women 25-29 show a slight decline in the participation rate, their employment soon rises and constantly increases until they reach 50. The urban pattern is different: The participation rates of women at 25-34 drop sharply until reemployment begins to appear in the late 30s shaping a second peak in the late 40s to form an "M" curve. However, the second peak does not reach the level of the first peak of the early 20s.

When labor force participation is divided into agricultural and non-agricultural sectors, the urban and rural non-agricultural participation patterns generally follow the urban pattern described above. The agricultural pattern follows the rural one.

The overall pattern of women's labor force participation in urban and rural non-agricultural sectors is similar to that of the urban participation pattern in all industrial sectors. The rate of participation increases and reaches a peak in ages 20-24; then it drops in ages 25-34 and begins to rise again in the late 30s to reach a second peak in the 40s before declining toward the retirement. It is evident that, whether in urban or in rural areas, non-agricultural occupational opportunities are more available to younger women than to older ones.

It should be pointed out that there are differences between the urban and the rural women's participation in non-agricultural sectors: First, in general, rural women have less opportunities than urban women; and, second, the degree of age-to-age variation of the rates is slight among rural women while

*There is a risk of disregarding the differences due to the age factor when we convert the age-differentials into a life-cycle pattern. There may be a large difference in the work life-cycles of young women and older men. Thus it may be inadequate to believe age differentials at one point of time as a sign of longitudinal trend, it should be more so in a rapidly changing society.

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sharp among urban women.

Women's participation in the agricultural sector reveals a completely different picture from that in the non-agricultural sector. First, the sector is dominated by rural women. Second, the participation rate rises consistently until the early 50s without any sign of decline in either urban or rural areas. Agricultural work seems to be available to women of any age or marital status.

The age-to-age variation in the women's labor force participation rates cannot be viewed as a result of age difference only. Women's age difference is closely related to changes in marital status and the number and ages of children, both important factors in influencing women's labor force participation.

Most Korean women automatically accept the marital responsibilities of caring for husband, children, relatives and household tasks. Marriage is almost universal in Korea and less than 0.5 percent of women remain unmarried in the 35-39 age bracket (Table 7). Furthermore, the traditional concepts of family perpetuation and old-age security are still widely valued so that every married woman is expected to give birth to at least one or two sons among her children. Married women who end up childless are very few (only 2.1 percent of ever-married women in the 45-49 age group were childless). Therefore, the age differentials in women's labor force participation have to be considered along with their marital and fertility status.

As indicated in Table 8, women's labor force participation varies according to marital status. The level of participation in non-agricultural sectors is

Table 7
The Proportional Distribution of Women
by Age and Marital Status, 1970

Age		Single	Married	Widowed	Divorced
15-19	100.0	97.1	2.8	—	—
20-24	100.0	57.2	42.3	0.2	0.3
25-29	100.0	9.7	88.4	0.9	1.1
30-34	100.0	1.4	94.6	2.4	1.6
35-39	100.0	0.5	92.0	5.9	1.8
40-44	100.0	0.2	84.8	13.4	1.7
45-49	100.0	0.2	76.9	21.8	1.2
50 and Over	100.0	0.1	45.2	54.2	0.5
Total	100.0	24.9	59.1	15.2	0.9

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Table 8
Women's Labor Force Participation Rates
by Marital Status, 1970

Sectors	Ever-Married				
	Single	Total	Married	Widowed	Divorced
All Industrial Sectors					
All Korea	44.8	35.7	35.9	32.8	63.5
Urban	43.9	16.8	14.2	23.7	61.1
Rural	46.0	45.0	50.7	37.9	64.6
Non-Agricultural Sectors					
All Korea	32.0	9.6	8.6	11.2	50.0
Urban	43.0	14.1	11.5	20.6	58.9
Rural	18.0	6.7	6.6	5.9	28.9
Agricultural Sectors					
All Korea	12.7	26.0	27.3	21.5	13.7
Urban	0.9	2.8	2.7	3.1	2.2
Rural	28.0	38.4	44.2	32.0	35.7

lower among ever-married women than among single women. Of the ever-married women, the employment patterns vary among three different groups: The married with husband present, the widows, and the divorced. Although the married women respond poorly to reentering or remaining in non-agricultural jobs, their contribution in rural agricultural sectors is considerable. This factor plays a major role in shaping the second peak of the "M" curve.

The other two groups show distinctive patterns in the level of labor force participation. Divorced women are more active than women of any other marital status and their participation rates, in both agricultural sectors, surpass those of single women. Divorced women may be forced to work to support themselves or their economic capability may have influenced their divorce. Whatever the reason, it is evident that there is a strong interrelationship between being divorced and participating in economic activity, particularly in non-agricultural sectors.

While widows are expected to face economic needs similar to divorcees, the difference in their level of labor force participation is considerable. Widows are, in general, the least active group and the reason for this may be found in the old family system in which widows rarely remarry but remain to be supported in the husband's house. Most contemporary widows still seem to follow this custom.

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Effect of fertility upon mother's employability is often divided into two types: The effect of the number of children, and the effect of small children who need adult care.

Table 9 shows the differential rates of labor force participation among ever-married women according to the number of children ever-born. Women's participation in all industrial sectors tends to increase, although not sharply, as the number of children ever born increases, suggesting a positive relation with fertility. Furthermore, there is little variation in the relationship of overall participation rate to fertility between urban and rural areas: In rural areas, the rate increases constantly as the number of children increases. In urban areas there is a mixed pattern among mothers with less than four children, although the rate increases for mothers with four or more

Table 9
Labor Force Participation Rates of Ever-Married Women
by the Number of Children Ever-Born, 1970

Number of Children	All Korea	Urban	Rural
All Industrial Sectors			
None	28.3	19.6	40.0
1	28.1	18.7	41.5
2	30.4	19.4	45.2
3	30.9	18.8	44.9
4	35.2	20.4	47.6
5	39.4	20.7	50.6
6 or more	43.1	23.4	51.9
Non-Agricultural Sectors			
None	13.3	16.9	9.1
1	12.0	14.8	8.9
2	10.9	13.5	7.3
3	10.0	13.3	7.1
4	9.7	14.3	6.7
5	9.2	14.6	6.3
6 or more	7.9	14.3	5.5
Agricultural Sectors			
None	15.3	2.7	30.9
1	16.1	3.9	32.6
2	19.5	5.9	37.9
3	20.9	5.5	37.8
4	25.5	6.1	40.9
5	30.2	6.1	44.3
6 or more	35.2	9.1	46.4

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children. The apparent positive relationship between women's employment and the number of children may be attributed to 1) the pressure upon parents of a large family to work to meet family needs, and 2) the automatic provision of childcare service by siblings.

However, an adverse effect of children upon mother's employability emerges in non-agricultural labor force participation. The participation rates decline as the number of children increases. This implies a negative effect of children upon mother's employment in somewhat incompatible types of work. The presence of one or more children limits the few employment opportunities for married women in professional, clerical, service, and production-related jobs.

Before we review the effect of child's age on mother's employment, let us briefly compare the degree of importance of marriage and children in limiting women's employment. Considering only non-agricultural labor participation, the rate drops more significantly when marital status changes from single to married with no child (32.0 percent to 13.3 percent) than when the fertility status changes from no child to one (from 13.3 percent to 12.0 percent) (Tables 8 and 9).

Mothers with preschool age children are less likely to be engaged in economic activity than mothers whose youngest child is in the 6-11 age group. This tendency is more obvious in urban areas than in rural ones and more prevalent in the non-agricultural sector than in the agricultural one. This may prove that the presence of children under 6 reduces mother's employability, particularly in the urban, non-agricultural sector.

However, the pattern reverses when we move to the next age group of the youngest child, 12-17. Their mothers are less active than women with younger children. This may be explained by the age of the mother, who may be too old for the labor force by the time her youngest child is 12. However, this does not apply to rural situations where many older women are working.

To summarize, a relationship between fertility and women's labor force participation appears only in the non-agricultural sector, where less than 10 percent of all ever-married women are working. If we exclude the relatively compatible sales work, the proportion becomes a little over 5 percent. Thus it appears that a mother's employment declines if the number of children increases or if there are very young children present at home. In sum, it has been found that the presence of children, especially very young ones, tends to limit mother's employability in some non-agricultural jobs, especially in urban areas.

On the other hand, fertility appears to have little influence on mother's employment in the agricultural sector. Indeed, mothers with many children are more likely to be in the agricultural labor force. Although children under 6 seem to influence mother's employability, more than 40 percent of the

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mothers with young children are in the agricultural labor force. The rate is even higher than the total average female labor force participation rate of 37.1 percent or the average 38.0 percent rate of rural women's participation in the agricultural sector.

Moreover, as a factor limiting women's employment in the non-agricultural sector, fertility does not seem to be as strongly correlated with employment as marriage is. It was noted that the participation rate in the non-agricultural sector dropped sharply when marital status changed from single to married with no child, but that there was only a slight decline in the rate as the number of children increased.

CONCLUDING REMARKS

In this brief report, the nature of interrelationships among various demographic characteristics of the Korean female population has been presented. Our major objective was to identify and interpret the relationship between fertility and women's labor force participation. The general trends of fertility and women's labor force participation during the 1960s suggested a negative correlation, so we assumed that there must be some direct connectedness between fertility behavior and an individual woman's employment. We also examined the effects of other demographic and social characteristics—age, place of residence, education, and marital status—upon fertility behavior and labor force participation.

Major findings concerning the relationship of fertility with women's employment and other variables can be summarized as follows:

1) After controlling for the effect of age, there appears an inverse relationship between the levels of women's educational attainment and fertility. Some secondary schooling seems to be particularly important.

2) Women in urban areas show lower fertility levels under all circumstances than do rural women. This reveals the strong influence of urbanization and urban ways of life upon fertility levels.

3) Contrary to what was expected, there appeared a slight, but positive, relationship between fertility and women's labor force participation. Working mothers tend to have a higher fertility than non-working housewives; and, mothers with large numbers of children are more likely to be in the labor force than women with fewer children.

4) However, this pattern is largely determined by the fact that the female labor force, especially the ever-married portion, is predominantly rural and employed in the agricultural sector. Among employed women in the urban, non-agricultural sector, a negative relation between fertility and labor force participation is found. The women employed in service, clerical, or production work in urban areas show lower fertility levels than housewives and

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working women in other fields. Women with many children have only a slight chance of being engaged in such types of work. Both employment and fertility are closely related to other factors such as education, family system, degree of urbanization, and so on, but it is difficult to separate the influences of these factors.

It should be remembered, however, that the negative correlation between fertility and employment is applied only to a small segment of women. At most, less than 10 percent of ever-married women belong to categories where the incompatibility of worker and mother roles could be felt strongly enough to reduce fertility.

For the majority of women, for example, non-participants and participants in agricultural or other relatively traditional sectors, fertility behavior is not affected by employment, nor is work participation affected by the level of fertility. It was also noted that a large proportion of single female workers leave their jobs upon marriage even before childbirth. These facts indicate that for most Korean women, economic activity is of secondary importance compared to the traditional role of housewife and mother. For them, having children, especially males, is crucial to secure mother's status in the family and parents' livelihood in old age. The concept of family perpetuation through a male heir is still a major reason for married women placing primary importance upon childbirth and childrearing.

The evidence of a positive relationship between fertility and employment among the larger segment of workers suggests that, if a high fertility has impact upon women's labor force participation, it is an encouraging one. Mothers are more likely to enter the labor force when they have many children to support. Women seek the kinds of jobs most compatible with their family roles.

It may be misleading, therefore, to believe that fertility is a restraint upon mothers' employability or that women's employment in any type of work reduces fertility. There appear to be signs of changing values as to women's role in the family and society. It was found that women workers in more modern sectors showed lower fertility than others. To them employment may signify the rights and opportunities for self-fulfillment as well as economic and social rewards. However, it is doubtful that such modern views are held by many women, even the highly educated. It is hard to believe that many women, especially those in rural areas, would limit their family size for the sake of employment.

Before we witness any significant effects of women's employment upon fertility, more fundamental changes in the family system and the cultural definition of women's role and position must occur. The quality of women's education must improve and their active participation in modern economic activities increase.

Fertility and Women's Labor Force Participation in Korea

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Determinants of Fertility Among Yorubas of Nigeria

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Abstract

A survey of 654 Yoruba households in rural and urban areas of southwestern Nigeria was undertaken to determine the impact of socioeconomic and life history variables on the fertility experience of Yoruba women. Among all variables considered, only education appeared to be of any significance. Consequently, the study is mainly descriptive rather than analytic.

The survey that is the basis of this report was designed to elicit information on patterns and determinants of fertility, and on the incidence of child mortality, among married Yoruba women in the West and Kwara States of Nigeria.

In a country without a vital registration system or a history of thorough censuses, another survey on fertility is not superfluous. Moreover, our survey differs from many fertility surveys reported in the demographic literature, because unusual questions were asked and some standard questions were omitted.

Rather than probe respondents' attitudes toward, knowledge of, and practice of modern methods of fertility regulation, the research was designed to identify the preconditions for widespread and effective use of such methods. The crucial question for our study was: Under what conditions will wide-

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spread adoption of modern methods of family planning take place in a society? To answer this question, information was needed about the circumstances predisposing people to use family planning services, with less than the usual emphasis on the kind of services they would need.

Widespread and effective use of family planning can succeed in helping mothers or couples achieve the desired number and spacing of births without necessarily effecting an overall reduction in the level of fertility in the society; that is, fertility regulation can take place without a concomitant fertility transition. Our speculations on the future of fertility in the region of Nigeria under study do not derive from the popular premise that mere adoption of modern methods of fertility planning will generate a downward trend in fertility. A preponderantly illiterate population, made up largely of farmers, will, in the process of modernization, tend to respond more positively to mortality-reducing practices than to attempts to reduce their fertility. Indeed, because such accompaniments of modernization as education, pure water, and hospital and other medical services contribute to reduction of pregnancy wastage caused by involuntary abortion, and maternal and infant mortality, modernization may be associated with an increase in fertility. Changes in cultural values, including those related to family formation, lag behind these health improvements and are associated with higher degrees of modernization. At what point in the modernization process such changes in cultural values occur is difficult to analyze.

Three categories of respondents were distinguished in the questionnaire design: Head of household, household members, and eligible women (ever-married women ages 15-49). The original research design called for interviewing 1,500 ever-married women ages 15-49 years in selected localities. As the field work progressed, it became obvious that an investigation of the circumstances that lead a woman to achieve or anticipate a particular family size must take account of her position within the household. Also—in a society where tradition is still strong, agriculture and petty trading remain the major occupations, and extended family ties are unbroken—to interview only women on the question of family formation is unrealistic. For example, the woman's occupation does not reveal all the pertinent facts; it is also important to determine her husband's occupation. The thesis is that in a patrilineal society where, even among the educated, tradition concerning value of children remains essentially unchanged, the woman's attitudes about family formation will be largely determined by her husband's preferences regarding children and by the conditions within the household. The husband's general orientation in terms of occupation, education, religion, and other matters, may provide a more meaningful explanation of the woman's fertility behavior than her employment status. Again, if religion is relevant to development of preferences, the husband's religion and the general

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household belief system, rather than the woman's religion, are paramount influences on her childbearing aspirations.

In a traditional society, if the man desires a certain family size, there is little the woman can do to prevent having that number of children. Should she fail to produce children of a particular sex, or be unable to achieve the desired family size due to fecundity impairment, infant mortality, or both, the man can and does take another woman. Therefore, an attempt was made to assess current fertility and mortality patterns by interviewing heads of households and other family members as well as ever-married women.

The head of household was asked to supply the following background information about his family:

- Size of household, including wife or wives, children, and other relatives ordinarily residing in his house and depending on him for support.
- Structure of authority—who decides matters relating to marriage, education, and extended family obligations.
- Economic conditions—sources of family income; dependency burden; who is responsible for paying for schooling, food, clothing, and health care.
- Position of women within the household; why a woman should work; what type of work is appropriate.
- Perceived changes in the society; indicators of such change (age at marriage, type of marriage, role of children); implications of such changes for family size, family cohesion, and extended family responsibilities.
- Family welfare—how comfortable are members of the household, in terms of space and amenities? Is the household environment livable.

The second category of respondents consisted of currently resident household members. Questions asked of them concerned their relationship to the household head, their sex, age, marital status, type of marriage, occupation, and literacy level. The aim was to relate background characteristics to the sociodemographic structure of households, as a basis for understanding the predisposition of women in matters relating to childbearing.

Despite the importance of the family's influence, it is not true that, in the traditional situation, the housewife has no way of expressing herself or implementing her own decisions. Social change in this setting implies, in part, an increasing awareness of the need for children to receive formal education, and women are seen as responsible parties in carrying out this

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parental obligation. In some cases, women bear a greater child support burden than men, especially among urban families where the women are successful traders. Such a woman may not only take care of her own children's education, but also maintain members of her husband's extended family in school.

Thus, not all women in Yoruba society are subordinates who only implement their husbands' wishes, and it was necessary to interview women as well as men. In addition, there is no adequate substitute for the woman respondent's own statements on the issue of family formation. A conventional female fertility questionnaire schedule was accordingly administered to ever-married women ages 15-49. The major questions concerned:

- Birthplace, place of usual residence, length of stay at the place of interview, age, religion.
- Marital history of respondent, current marital status, and, where appropriate, position in polygamous marriage.
- Educational attainment of respondent and her husband.
- Economic situation of respondent and her husband—employment status, type of work done, income from all sources, actual and expected income, and implications of anticipated income for family formation.
- Fertility and child mortality history, expected family size, sex preference, childcare practices, and role of housemaids, relatives, et cetera, in child care.
- Respondent's childhood situation, number of children borne by her mother, number of those surviving.
- Use of family planning methods, duration of use, sources of information.

RESEARCH DESIGN

This section provides the statistical basis for generalizations about the population. Procedures for selection of the sample are outlined, and composition of the final sample is discussed.

The population to be studied was defined to include ever-married women ages 15-49 and—to provide needed background information—other members of the women's households. A household was defined as a man, his wife or wives, all resident children of the union(s), and all persons related to the head of household (directly, or indirectly through his wife or wives) who were dependent on him for livelihood and/or support. Couples without chil-

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dren or dependents were considered households, but unmarried persons living alone or maintaining dependents other than their children were not defined as households. A dwelling unit might contain more than one household or none at all, especially in places where dwelling units are inhabited by young unmarried tenants.

Since female sample size was predetermined, it was necessary to calculate how many dwelling units would generate a number of households that would yield a sample size of 1,500 eligible females. Not all households were eligible because of the additional condition of ethnic (Yoruba) homogeneity that had to be satisfied to control for cultural influences on fertility behavior. The eligible woman had to be a Yoruba, married to a Yoruba man, and resident in a Yoruba household.

Scope

Geographically, the inquiry covered the Yoruba population in the southwestern quarter of Nigeria, incorporating four (Oyo, Lagos, Ogun, and Ondo) of the country's present 19 states, plus part of Kwara State. A list of localities was compiled from census records and survey maps. Four categories of localities were identified, on the basis of the 1963 census returns, and one locality was selected at random in each size category as follows:

<u>Category</u>	<u>Selected Locality and 1963 Population*</u>
100,000 or more inhabitants	Ibadan (627,379)
10,000 - 99,000 inhabitants	Share-Yoruba (16,702)
1,000 - 9,999 inhabitants	Ora-Ekiti (2,163)
Less than 1,000 inhabitants	Aiyeye (290)

Sample

On the basis of the 1963 census figures, it was estimated that Ora-Ekiti would generate 300 women for the sample, and Aiyeye 150, or 450 out of the total 1500. The remaining 1,050 eligible women were to be divided between Ibadan and Share-Yoruba in the ratio 2:1—Ibadan 700, Share-Yoruba 350.

The selection procedure on Ora-Ekiti and Aiyeye was quite simple. Interviewers were to visit every dwelling unit and interview all eligible women. In each case, the fertility interview was preceded by a household survey during which household heads were interviewed and the household record form

*Given the unpredictability of migration and total lack of data on vital rates, no attempt was made to project the 1963 figures to the present.

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was completed. In all, 125 housing units (excluding institutions and unoccupied houses) were identified in Ora-Ekiti, but only 96 heads of household agreed to be interviewed. Information was obtained from 620 people residing with these 96 household heads; however, only 162 questionnaire schedules on eligible women (rather than the targeted 300) were judged valid. The respondents were generally cooperative, but in some cases no information was obtained from eligible women because the confidence of the head of the household had not been won. Where heads of household could not be located after three recalls, it was impossible to interview eligible women. In some houses, no member of the household was available for questioning, not because the houses were unoccupied, but because every member of the household was traveling.

In Aiyeye, the experience was the same except that people seemed generally more cooperative. This may be due, in part, to the greater exposure to outsiders in Aiyeye, a local periodic market center where, on a typical market day, the population may more than double. Listing of housing units and identification of household heads were done on the nonmarket days, and care was taken not to interview people on market days. The complete survey of all dwelling units resulted in identification of 667 household members residing with 106 household heads, and valid questionnaire schedules were returned for 110 eligible women.

Share-Yoruba, in Kwara State, differs somewhat from the other localities studied, since it is one of the northernmost Yoruba settlements and the influence of the northern savanna environment is easily perceived. As is true of Kwara State, the town is not ethnically homogeneous; Share is made up of two separate but contiguous neighborhoods occupied by the Yoruba and the Bororo (Tapa) peoples. In Share-Yoruba, 176 heads of household were identified and 212 eligible women were interviewed from a list of 1,111 household members.

Selection of the sample in Ibadan, a city of over one million people that exhibits features both of a modern urban environment and a traditional, countryside setting, followed a more complex procedure. Any social sample survey of Ibadan must recognize the old and the new segments of the population, as well as the transitional migrant element with its varying degrees of exposure to the urban environment.

A multistage sampling procedure was accordingly adopted. Twelve inhabited clusters were identified, using random selection from survey maps. Initially, each cluster was assigned an equal sample of 60 elements, to yield a total sample size of 720. After several recalls, 601 valid interviews of eligible women were returned from 276 households, and data on social, demographic, and economic characteristics were collected from 1,865 household members.

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Summing up, 1,739 people were successfully interviewed in the four localities, including 1,085 eligible females and 654 heads of household, to elicit information relevant to the "prospects for fertility transition or regulation" among the Yoruba population of Nigeria. In addition, census-type data were collected from 4,263 other household members in the four localities.

FERTILITY PATTERNS

In this section, patterns of fertility among different social, economic, and demographic categories of women interviewed in selected localities are analyzed. Fertility is measured in terms of 1) average number of children ever born, and 2) reported number of children born per woman of a specified age group within the 12-month period preceding the survey. The former measure is generally referred to as retrospective fertility; the latter is conceived as an indicator of current fertility. Both indicators are used here as complementary measures of fertility.

The major concern here is to provide a data base for speculation on the future of fertility in this region. What are the prospects for a transition from the current high fertility levels to low levels? Modernization variables are expected to generate a downward trend in fertility and, initially, in mortality, as society develops socially and economically. To arrive at meaningful, testable hypotheses about this process, we began with an analytical profile of the population of women studied.

Characteristics of Respondents

Socioeconomic factors. Certain questions were designed to elicit information about the social, economic, and demographic conditions of interviewed women, so that a sound basis could be provided for examining patterns among women in different environmental conditions with varying degrees of exposure to modernization.

Social factors studied included education and religion. Of the two smaller settlements, Aiyeye is predominantly Moslem, whereas a large majority of respondents in Ora-Ekiti are Protestant. Ibadan and Share-Yoruba have almost the same Moslem-Protestant ratios, but when all Christians are grouped together, the Moslem population is in the minority in the two towns.

As for education, with the partial exception of Ibadan, this survey amounts to an investigation of fertility behavior among a predominantly illiterate population. Even in Ibadan, about 43 percent of the interviewed women were considered illiterate. The category with education beyond the primary level accounted for only 23 percent of the 600 women identified in Ibadan, and elsewhere the literacy situation was worse; in general, over 80

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percent of the women interviewed were illiterate. Of the 11 percent in Aiyeye who were literate, none had more than primary education, and in Share and Ora-Ekiti, only about 3 percent of the interviewed women had more than primary education. Thus, even if education is a significant factor in fertility, its impact is limited in Share, Ora-Ekiti, and Aiyeye where the level of literacy is uniformly low among women of childbearing age.

Several questions were asked about the economic situation of interviewed women, their husbands, and their parents. To derive an adequate indicator of labor force participation, women were questioned concerning employment status and type of work done. In general, occupational questions were answered satisfactorily.

The degree of occupational specialization was limited in the smaller localities. Except in Ibadan, trade and farming together accounted for more than 70 percent of all surveyed women. (The occupations of Ibadan women were more diversified and significantly different from those of women in the other, smaller settlements. Less than 1 percent of the 600 women interviewed in Ibadan claimed to do agricultural work, compared with about 39 percent in Share and 43 percent in Ora-Ekiti.) About 73.5 percent of interviewed women in Ora-Ekiti were in trade or agriculture; in Aiyeye the proportion was 83.7 percent, and in Share-Yoruba, 81.5 percent. In all the localities, trade was the dominant occupation, engaging some 48 percent of interviewed women in Ibadan, 42.9 percent in Share-Yoruba, 67 percent in Aiyeye, and 30.3 percent in Ora-Ekiti. The preponderance of traders among working women in Aiyeye is related to the function of the locality as a periodic market center for neighboring settlements.

Most women claiming to be traders were involved in the sale of agricultural products and, to some extent, manufactured products that may or may not involve any substantial capital investment. The distinction between women traders and farmers in the smaller settlements is probably nonexistent. Whether on the farm collecting products to be sold in the market, or in the market displaying farm products for sale, the work roles of women in the rural setting are essentially the same. For this analysis, the type of work done is, therefore, not a relevant factor in fertility behavior, especially among women who live in farming families and whose orientation is essentially rural and agricultural.

Demographic factors. Age, mortality (especially infant mortality), and nuptiality are pertinent factors in explaining fertility differences. In Ibadan and Share, about 50 percent of the women interviewed were ages 15-29, while in Aiyeye and Ora-Ekiti less than 30 percent fell into this age category. The rural population was thus made up largely of older women while the larger settlements had a greater proportion of women in the younger, more fertile age groups. Moreover, because of selective outmigration of males, it

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is likely that the low proportion of rural females ages 15-29 is still higher than the proportion of males in this category.

Analysis of household data suggests that marriage is nearly universal among adult females. Traditionally, among the Yoruba, it is expected that as soon as a girl has matured in biosocial terms, as defined by age or physiological maturity, she should marry. In the traditional setting, marriage is a family affair. If the girl is unable to attract a suitor, it is the responsibility of her parents to provide one.

Polygamy is still widespread, especially in the smaller localities. In Aiyeye, for instance, 64 percent of the women interviewed were in polygamous unions; in Share the proportion was 53 percent, and in Ora-Ekiti, 44 percent. Even in metropolitan Ibadan, about 38 percent of the women interviewed were in polygamous unions. However, in all four localities, the proportions of respondents born into polygamous families is considerably higher than the proportions who were themselves in polygamous marriages. In Ora-Ekiti, about 92 percent of the women came from polygamous homes, as did about 90 percent of interviewed women in Aiyeye, 63 percent in Share, and 62 percent in Ibadan. The current generation of women in the reproductive age groups thus tends to be less polygamously involved than their parents, and the declining trend in polygamy may have implications for fertility. Although it is not clear from the literature whether polygamously married couples are more fertile than couples in monogamous unions, the association of polygamy with illiteracy and traditionalism suggests that women in polygamous unions are likely to exhibit higher fertility than those monogamously married.

Use of contraception. The conventional questions on family planning were deliberately limited in number since the pilot study indicated that in three of the four localities (Share, Aiyeye, and Ora-Ekiti) it would be useless to ask women about their degree of exposure to modern methods of family planning, owing to general ignorance of such matters. The final survey data show that not one woman interviewed in Ora-Ekiti reported having used any method of fertility regulation. In Share, less than 5 percent of the 210 women interviewed indicated having used any family planning method, and in Aiyeye, less than 2 percent. Even in Ibadan, where 57 percent of the 601 women interviewed had at least primary education, only 18 percent had ever used any method of regulating fertility. It is, therefore, not useful to relate contraceptive use to fertility levels among women in Share, Aiyeye, and Ora-Ekiti. Given the limited extent of family planning practice among the interviewed women in Ibadan, it was hypothesized that differential fertility there would not be related to the practice of family planning but to other modernizing influences that are major elements in social differentiation.

Household composition. It is suspected that differences in household

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structure may influence family size. In particular, the presence of grandmothers and/or housemaids within the household may be conducive to perpetuation of the high-fertility culture, since in such a household, childrearing is a shared responsibility. Whether or not the grandmother is resident, it is the responsibility of her children to support her when she becomes too old to work, so that her presence within the household is not an additional cost to the child with whom she resides. Indeed, the resident grandmother performs useful functions, especially in urban settings where both the husband and wife are wage earners and the grandmother serves as a babysitter at no cost. Where no grandmother is resident, modern couples place great reliance upon the services of housemaids for much domestic work—cooking, washing, cleaning, and more important, taking care of the children. In Ibadan, about 23 percent of the interviewed women reported employing housemaids, and about 40 percent said that they were housing relatives, most of whom were directly involved in various aspects of domestic work, including child care. In Share, Aiyeye, and Ora-Ekiti, more than 20 percent of the interviewed women reported that relatives resided with them. The extended family structure is found among both rural and urban Yoruba, whereas employment of housemaids for childrearing and other domestic duties is essentially urban. Less than 4 percent of interviewed women in Share and less than 2 percent of women in Aiyeye and Ora-Ekiti have ever used housemaids.

Fertility levels. Tables 1 and 2 contain data on average number of children ever born per woman and age-specific fertility rates of women ages 15-49, by 5-year age group.

There is no obvious association between size of locality and fertility. Average family size in Ibadan (3.9 children) is marginally higher than that reported for Aiyeye women. Ibadan women are more fertile than women in Share, where average number of children ever born is 3.4, but they are less fertile than women in the rural community of Ora-Ekiti, who reported the highest overall average, 4.8 children.

In general, significant additions to family size are not experienced among women ages 39 and over. If women ages 40-44 are regarded as having ended childbearing, then completed fertility is 5.4 in Ibadan and Share, and 5.9 in Ora-Ekiti. The lowest completed fertility (4.4) is recorded among Aiyeye women, largely petty traders in the market settlement and, for the most part (84 percent) born outside Aiyeye. An urban-rural fertility differential is not discernible; however, Ibadan women are more fertile at younger ages (15-24 years) than are their counterparts in the smaller localities, so that if younger women in the city of Ibadan pursue their reproductive activities as vigorously as up to now, they are likely to report higher completed fertility than women in the smaller settlements. The evidence presented in Table 2 indi-

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Table 1
Average Number of Children Ever Born per Woman
By Age Group of Mother, 1975

Age Group of Mother	Locality							
	Ibadan		Share		Aiyepo		Ora-Ekiti	
	Mothers (Number)	\bar{X}	Mothers (Number)	\bar{X}	Mothers (Number)	\bar{X}	Mothers (Number)	\bar{X}
15 - 19	18	1.4	14	0.8	8	-	10	0.7
20 - 24	92	2.3	57	2.2	8	0.6	12	1.9
25 - 29	181	3.3	37	2.9	9	2.6	23	4.0
30 - 34	108	4.2	50	4.3	15	3.9	23	5.3
35 - 39	62	5.1	23	4.4	25	4.5	20	5.8
40 - 44	43	5.4	16	5.4	16	4.4	30	5.9
45 and Over	65	5.8	8	5.0	26	5.2	37	5.9
All Ages	569 ^(a)	3.9	205 ^(a)	3.4	107 ^(b)	3.8	155	4.8

^(a) Excluding 4 missing observations

^(b) Excluding 3 missing observations

^(c) Excluding 31 unknown cases

\bar{X} = Average number of children per mother

Table 2
Age Specific Fertility Rates (ASFR) of Women
In Ibadan, Share, Aiyepe, and Ora-Ekiti, 1975

Age Group of Women	Locality							
	Ibadan		Share		Aiyepe		Ora-Ekiti	
	Number	ASFR	Number	ASFR	Number	ASFR	Number	ASFR
15 - 19	17	294	14	71	9	-	10	200
20 - 24	92	380	57	175	8	333	12	417
25 - 29	181	320	38	132	9	222	23	522
30 - 34	108	287	50	160	16	125	23	304
35 - 39	62	65	23	44	25	200	20	200
40 - 44	43	47	16	-	17	176	30	67
45 and Over	66	15	8	-	26	77	37	54
Total	569*	239	206**	121	110	155	155	219

* Excluding 31 missing observations

** Excluding 4 missing observations

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cates a higher level of fertility among Ibadan women than among women in the other localities, except Ora-Ekiti.

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Infant and child mortality. Information on child mortality among the studied population was derived from experience reported by mothers. These data indicate that Ibadan women with completed fertility (ages 40-44) have lost 9.1 percent of their total live births, compared with 25.4 percent for Ora-Ekiti, 20.5 for Aiyeye, and 13 percent for Share women. Replacement motivation is obviously least in Ibadan and greatest in the villages, especially in Ora-Ekiti, where one-quarter of all children born alive are not expected to survive to adulthood.

In the short run, women experiencing lower infant/child mortality exhibit reproductive behavior similar to that of those experiencing high mortality. Women with completed fertility in Ibadan and Share are equally fertile, even though their mortality experiences are different. Ibadan women ages 40-44 reported 5.4 live births with 9.1 percent mortality. Share women had 5.4 live births and child mortality of 15 percent. Child mortality is still higher among women of completed fertility in Aiyeye and Ora-Ekiti, but completed fertility is lower in Aiyeye than in Ibadan. Average child mortality in Ibadan is only 39 percent of the Ora-Ekiti average, but Ora-Ekiti women with completed fertility are only 9.3 percent more fertile than Ibadan women. Thus, lowered mortality does not bear any evident relationship to reduced fertility.

Educational factors. Education influences fertility directly by affecting preferences for children versus preferences for other needs, and by weighting preferences in the direction of a certain quality and number of children. Indirectly, other things being equal, education tends to reduce the duration of exposure to the risk of pregnancy by delaying age at marriage. Education is also related to other factors that have a bearing on fertility, such as occupation, income, et cetera.

The four localities studied can be divided into two distinct groups, according to degree of exposure to formal education among the interviewed women as well as the actual availability of educational facilities. With some 45 post-primary schools and teacher training colleges, a polytechnical institute, and a university, Ibadan is a leading educational center in Nigeria, and if the degree of concentration of educational facilities is an index of modernization, Ibadan is easily among the most modern localities in the country. On the other hand, Share, Aiyeye, and Ora-Ekiti are essentially rural in character. In all three centers, the only type of educational institution is the primary school: Share has four primary schools, Ora-Ekiti two, and Aiyeye only one. The degree of concentration of educational facilities is directly

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reflected in literacy among women. Only 40 percent of the interviewed women in Ibadan were classified as illiterate (unable to read or write, and not having completed primary education), compared with 81 percent in Share, 84 percent in Aiyeye and 88 percent in Ora-Ekiti. The number of women classified as educated (primary education and beyond) in Share, Ora-Ekiti, and Aiyeye is so small that a comparative analysis of fertility according to educational level would be absurd. Only among Ibadan women are reasonably large samples of educated women found in the different educational categories, and analysis of the influence of post-primary educational level on fertility is therefore limited to Ibadan women.

Tables 3 and 4 show the reported average number of children ever born to Ibadan women, by educational level, and to illiterate women in all four localities. Illiterate Yoruba women, whether urban or rural, do not seem to differ in their reproductive performance; Table 4 shows illiterate women in the metropolis of Ibadan are at least as fertile as women in the smaller rural settlements. Illiterate women ages 40-44 in Ibadan have a higher average number of live births than illiterate women in the rural community of Aiyeye, but slightly lower than the averages for those in Share and Ora-Ekiti. Illiterate Ibadan women ages 45 and over are distinctly more fertile, with an average 6.3 live births, than their counterparts in rural locations. Even younger illiterate women, ages 15-24, appear to be more prolific in urban than in rural areas. This phenomenon may be related to the better

Table 3
Average Number of Children Ever Born by Age
Of Mother and Level of Education, Ibadan, 1975

Age Group of Mother	Level of Education							
	Illiterate		Primary Schl.		High School		University	
	Mothers Number	\bar{X}	Mothers Number	\bar{X}	Mothers Number	\bar{X}	Mothers Number	\bar{X}
15 - 19	11	1.5	5	1.2	1	0.0	-	-
20 - 24	41	2.5	25	2.2	12	1.9	2	2.0
25 - 29	56	3.5	62	3.2	22	2.9	11	2.5
30 - 34	48	4.6	25	4.0	13	4.2	3	3.0
35 - 39	31	4.8	11	4.5	8	5.1	1	5.0
40 - 44	15	4.9	14	6.0	5	6.0	2	5.5
45 and Over	37	6.3	7	6.6	4	4.5	7	3.5
All Ages	239	4.1	149	3.7	65	3.5	26	3.1

\bar{X} = Average Number of Children

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Table 4
Average Number of Children Ever Born To Illiterate Mothers
By Age: Ibadan, Share, Aiyeye, and Ora-Ekiti, 1975

Age Group of Mother	Locality							
	Ibadan		Share		Aiyeye		Ora-Ekiti	
	Mothers Number	\bar{X}	Mothers Number	\bar{X}	Mothers Number	\bar{X}	Mothers Number	\bar{X}
15 - 19	11	1.5	11	0.8	5	-	4	1.0
20 - 24	41	2.5	44	2.4	5	0.6	7	2.6
25 - 29	56	3.5	29	2.9	5	2.0	17	4.4
30 - 34	48	4.6	39	4.2	13	4.0	19	5.5
35 - 39	31	4.8	19	4.5	25	4.5	20	5.8
40 - 44	15	4.9	15	5.5	16	4.4	28	6.0
45 and over	37	6.3	6	5.7	26	5.2	37	5.8
All Ages	239	4.1	163	3.4	95	4.0	132	5.3

\bar{X} = Average Number of Children

health and environmental conditions to which urban women are exposed, regardless of their educational levels, as compared to residents in the studied rural localities, who do not enjoy the benefits of modern hospitals and clinics, pure water, electricity, and modern sanitation.

Average family size among illiterate women in Ibadan is higher than that reported by women who only completed primary education; women with high school education appear to be slightly less fertile than primary-school educated women; and university-trained women report a lower level of reproductive performance than high school graduates. Among women ages 35-39 and ages 40-44, the pattern of declining fertility with increasing level of education is not upheld, but the limited numbers of women in these age categories who are high school and university graduates make comparisons difficult. Thus, education appears to exert a depressing influence on fertility, but it is unlikely that introduction of universal primary education will reduce fertility performance significantly. In fact, as explained below, higher levels of literacy may enhance reproductive performance.

Occupation and fertility. Illiterates and less educated people are generally found in farming, mining, lumbering, and other forms of manual work, as well as in trade, whereas highly educated men and women tend to be concentrated in white collar, professional occupations. Occupational specialization among interviewed women in predominantly illiterate communities (Share, Aiyeye, and Ora-Ekiti) was limited. Virtually every working woman

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in these localities (except for about 13 teachers and 27 tailors, out of a total of 484 women interviewed) was involved in some aspect of agriculture—planting, harvesting, and selling farm products. The very small numbers involved in nonagricultural, nontrading pursuits make it difficult to analyze fertility patterns by occupation.

Children of farming mothers and traders assist in domestic work, in the fields, and in the local market. In the rural areas, there is no real conflict between trading or farming activities and motherhood responsibilities. In Share, no significant difference in fertility was found between women traders and farmers. Farming mothers of all ages reported an average of 3.7 live births per woman; the average for traders was 3.4. Among Ibadan women, however, there are subtle differences in the fertility of women in different occupational categories. Unemployed women had the highest average number of live births (4.2), almost the same as the average of 4.1 reported by traders and nurses. Only clerical workers (and to some extent female teachers) had a significantly lower level of reproductive performance than the reported averages for other professions and for women in the unpaid family worker category. Women in the clerical category were relatively young, compared with the unemployed and trading women and by implication had more years of exposure to the risk of pregnancy before them than the comparatively older women in those categories. Women in tailoring and professional occupations had an average of 3 live births, comparable to the average of 3.1 reported for clerical workers; however, the small number of women in the former category makes it difficult to control for age.

Religious factors. In Ora-Ekiti, about 94 percent of the interviewed women were Protestants, the remainder of the sample was split among four different religious groups. In Aiyeye, where about 65 percent of the interviewed women were Moslems, the remaining 39 percent, divided almost equally among the Protestant, Christian-Aladura and No Response categories, comprised too small a sample to permit an age-specific fertility analysis. Only in Share and Ibadan was the sample of interviewed women sufficiently diversified to permit analysis of fertility differentials by religion. In Share, the average number of children ever born ranged from 3 among Moslem women to 3.8 among Catholics, with the other Christian groups (Aladura and Protestant) occupying an intermediate position. With a difference of only 0.8 live births between the most fertile and the least fertile religious groups, it appears that religion does not greatly differentiate fertility levels among the interviewed women in Share. In Ibadan the range of fertility between the most and least fertile religious groups was even smaller than in Share. Both Catholics and Protestants reported averages of 4 live births, followed by the Moslems with 3.8. The least fertile was the Aladura group, with an average 3.7 live births.

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In both Ibadan and Share, Catholics exhibited the highest fertility levels. Moslem women approached Catholic performance most closely in Ibadan, but Moslems in Share appear to be the least fertile religious group in that locality. Urban Aladuras appear to be more fertile than their counterparts in Share, a smaller town, and the same is true of Protestants, who reported an average of 4 live births in Ibadan, but 3.2 in Share.

If women ages 35-39 are regarded as having almost completed their fertility, Catholics in Ibadan and Share exhibit the highest level of fertility, with an average 6.2 live births in Ibadan and 5.1 live births in Share. However, the number of respondents in this category is very small—five in Ibadan, nine in Share.

Summary. The variables that differentiate fertility performance among the Yoruba are educational level and, to a limited extent, occupation. The existence of fertility differentials between the small group of modernized urban dwellers and the larger group of emerging urban residents has been partially demonstrated. Less socially exposed urban residents exhibit a level of fertility performance that is high and comparable to rural rates.

Fertility differentials between urban and rural areas and between categories of persons may not appear where social and economic differentiation is not yet far advanced. Clear-cut fertility differentials between Ibadan metropolis and the smaller rural communities are lacking because, as yet, only a small proportion of urban dwellers can be said to be distinctly more advanced than the rural dwellers. A significant proportion of urban women, despite their lack of education, has translated accessibility to better health and nutrition conditions into higher fertility levels. In the absence of notable changes in attitudes toward family size, these less modernized urban residents will continue to experience levels of fertility performance comparable to rural rates.

CONCLUSIONS

The above analysis confirms that fertility among rural and urban Yoruba people of southwestern Nigeria is high. What is not altogether clear is the extent to which social and economic progress, especially in the urban environment, has influenced the fertility of Yoruba women, and whether the Yoruba of Nigeria will necessarily experience a transition from high to low levels of fertility in the manner seen in the Western demographic experience. Only limited differentiation in fertility by social and economic variables is visible, and there is no sign of a decline in fertility in the immediate future. Not only is actual fertility high, but the number of children considered ideal by surveyed women is equally large. Although the Yoruba region of Nigeria is the most highly urbanized section of the country, tradition in family size

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matters has remained virtually unchanged in the face of developments that are transforming the economy and society.

Nigeria's population growth rate is already rapid. It is possible that fertility levels among the Yoruba, and in Nigeria as a whole, will rise further following introduction of the proposed Universal Primary Education scheme. Primary education, by exposing the younger generation to rudimentary rules of hygiene and better dietary habits, may generate higher fecundity without influencing traditional family formation habits, and improved living conditions are also expected to reduce general mortality, particularly among infants. Under such conditions, family planning services are needed to prevent already high fertility levels from rising. However, expansion of family planning services is not necessarily a step toward reduction of overall fertility levels. The motivation for initial use of these services would be the desire to prevent actual fertility from exceeding anticipated or ideal family size—which, the study shows, is high.

To ensure maximum results, family planning, in its initial stage, should be directed to urban, educated, well-motivated couples. To expand family planning programs aimed at the rural population in the hope that availability of services will generate demand for them, or that couples can be motivated through massive propaganda, may be wasteful of resources and objectionable on social and moral grounds. That is, it is objectionable to make a family planning clinic the only modern facility available to a rural population. One solution may be to provide family planning services as part of a general program of medical care in both rural and urban areas.

Turning to research priorities, Nigeria needs an established machinery for continuous recording and periodic analyses of vital events, as a storehouse of information for studies on fertility and mortality. A national demographic sample survey is needed to provide data for future evaluation of vital rates derived from the proposed national registration system. Such a survey would also compensate temporarily for the deficiencies in censuses held to date.

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Determinants of Breastfeeding Behavior in Rural Filipino Households

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Abstract

This is a report of a continuing study of the socioeconomic, health, and psychological determinants of rural Filipino women's breastfeeding behavior. The investigators found that a positive attitude toward breastfeeding was a more important breastfeeding determinant among the poor, while changing wage rates and other economic relationships were more important among the rich. The rich have a lower probability of breastfeeding than the poor, and when the rich women breastfeed, they do so for fewer months than do the poor.

Editor's Note: Although this study is not an examination of interrelations of breastfeeding and fertility, as might be expected for a report in this monograph, it is one of the few analyses made of the socioeconomic correlates of breastfeeding—a major fertility determinant. The investigators examine breastfeeding behavior in the rural context, which is still mankind's primary setting for decisionmaking regarding family growth.

The duration and frequency of breastfeeding are important factors in determining both the fecundity of the mother and the nutritional status of the child (Rosa 1975, Osteria 1973, Buchanan 1975). This is especially true in areas where per capita income is low and substitute foodstuffs are not easily accessible or available. In these areas, the infant depends on human milk for

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survival and normal growth during the first part of its life. While there have been numerous studies on the consequences of breastfeeding behavior, minimal work has been done on the determinants of key measures of breastfeeding behavior. In this study, breastfeeding participation, the time per day spent breastfeeding, and the duration of breastfeeding are examined in a multivariate framework.

Key determinants analyzed in this study are the socioeconomic status of the mother, the nature of her job, her nutritional status, the role of belief patterns, and the effect of the household age and sex composition in providing a surrogate mother. The role of the mother is examined in depth. A theoretical infant nutrition model was used to derive this breastfeeding model.

SPECIFIC DETERMINANTS OF BREASTFEEDING BEHAVIOR

These determinants are derived from the model outlined in Appendix A. Essentially, breastfeeding is related to the shadow prices of both infant nutrition and the alternate household attributes desired. We use the term shadow price because households do not pay a direct price for all aspects of infant nutrition, yet a time or money price can be attributed to each component. In infant nutrition, for example, bottle milk, and especially breastmilk, may require time and purchases of certain market goods. The cost of each input should be reflected in the total hypothetical or shadow price of these components of infant nutrition. We do not directly estimate the prices of these items and then analyze the effects of the price changes on breastfeeding behavior. Rather, we use the factors affecting these prices, such as the value of the mother's time, to determine the crucial variables for our breastfeeding determinants function. The factors that affect these shadow prices include the nature of the mother's time allocation and the value of her time, the value of the time and availability of mother surrogates, the price of substitute and complementary foods, certain psychological and physiological factors which affect the mother's ability to breastfeed, and variables which shift the mother's preference away from or towards breastfeeding.

Dependent Variables

There are four possible dependent variables—total sucking time per day, a yes-no breastfeeding variable, the duration in months of breastfeeding, and the frequency per day. The first, total sucking time, might be thought at first to be the most appropriate variable inasmuch as sucking time is thought to be related to the fecundity effect. But breastfeeding may be used to pacify the infant. For this and other reasons, it is not clear if sucking time has the

*A discussion of this model is presented in Appendix A.

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same effect on infant nutrition that it has on maternal fecundity. We use the time per day, duration, and yes-no (participation) variable.

Time per day is felt by some to be a critical factor in explaining the amount of prolactin secreted (Jelliffe, personal communication), and this, in turn, is suggested as being responsible for the lactation-postpartum-amenorrhea relationship. Similarly, a positive relationship between duration and postpartum amenorrhea has been shown (Osteria 1973, Crisol and Phillips 1974).

It should be noted, however, that time per day is a controversial variable; it may be that the complete emptying of the mother's breast is more important. Very little research has been done on the relationship of participation to prolactin stimulation, and to child development as well, but on the basis of our experience we feel justified in examining this parameter. The duration parameter measures the months the infant is breastfed. And, finally, the participation variable is for mothers having children ages 0-3 years during the first month of the infant's life.

Independent Variables

Value of the mother's time (Wm). Mothers spend a great deal of time breastfeeding their infants. Lactating mothers who were observed for two days spent about 34 minutes per day breastfeeding while bottle feeding mothers only spent 17 minutes per day. The major cost of breastfeeding a child is the time input of the mother. This is because there are less possibilities for substituting other persons for the mother's time. We expect that as the economic value of the mother in market occupations increases, she will be less likely to breastfeed her infant.

There is no single accepted way to value the mother's market or nonmarket time. First, it is clear that there is some value to her breastfeeding time at home because there are market alternatives, (for example, maids, canned milk). Second, the time inputs the mothers give to breastfeeding will lead to 1) the loss of a job or inability to work because certain time rigidities do not allow part-time or intermittent work, 2) the loss of income from part-time work, or 3) the loss of time which could be spent in other household work or in leisure activities. For these reasons we give the mother's breastfeeding time a positive value. Essentially, the exact value depends on the supply and demand for time of the mother and we should put a value on the marginal productivity of the mother's time in market and home production.

Factors affecting the estimation of this value (mainly the demand aspect) include the value of the father and other household members' time and household productive assets, the age and education of the mother, some key preference factors, and labor market and commodity price conditions facing her. We estimate a market wage for each mother based on the hourly wage rate of working mothers. There are numerous ambiguities in the estimation

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of this market wage rate for working women. Another issue relates to the fact that the market wage rate is likely to be higher than the market women's value of time.* Numerous aggregation and measurement problems made it impossible to estimate an exact market value of time.**

We assume breastfeeding participation will decline as the woman's value of time increases. This may not be true in all cases. When an increase in the value of time occurs, the value of time at work increases relative to that in home and leisure activities. Offsetting this is the assumed positive relationship between increased total income and an increased desire for leisure and other preferred home activities. This hypothetical value-of-time effect may be stronger on breastfeeding time and duration than on participation for two reasons. First, preferences may play a key role in explaining breastfeeding participation. Second, there is a usual one- to three-month period after conception during which most women do not work. During this period, the value-of-time effect may be more limited.

Household size and composition. There are several key age composition effects. First, the mother's marginal productivity at home relative to market production will increase as additional young children are present. Thus we would expect the presence of other preschool children to increase her breastfeeding behavior.

Second, children can act as mother substitutes. In another, more in-depth analysis of childcare patterns among rich and poor Laguna households, it was found that both boys and girls ages 7-12 and girls ages 13-15 acted as important substitutes for the childcare time of the mother (Popkin 1976). Similar substitution can be made for the mother's time in childcare. The impact of additional children in any age group is highly dependent on the total number of children in the household (Lindert 1974). In the analysis of duration and time of breastfeeding, these size/composition effects for the age 7-12 group are analyzed together.

There is a third demographic relationship. There are usually important cultural norms governing childcare. They may prescribe that older children can take care of certain age groups but not others. Or they may require the mother or grandmother to perform certain roles. It appears that older children seldom take care of infants less than a year old, but often care for

*The ideal measure, the marginal wage rate, is difficult to determine since rigidities in time schedules prevent women from working extra hours. For those who do have second jobs, the secondary wage rates are usually lower. Also, the ratio of costs to income from secondary jobs is usually higher as tax rates and fixed travel costs represent a larger fraction of income.

**The key measurement problem was the inability of these rural households to estimate a task replacement cost on a time basis. The aggregation issue deals with a wide variety of occupations. Moreover, within each occupation there is wide mix in the type of capital inputs and capital labor ratios. Appendix B contains an estimation of this parameter.

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preschool children ages 1-6 (Popkin 1976). These norms may not be rigid and economic necessity or other factors may cause them to be broken. Our demographic effects should capture these relationships.

Value of time of father and children. The time price of infant nutrition is high relative to the time price of other consumable items. Thus we might expect that increases in the value of time of the father and other children will lead to a substitution of market work for home-production child nutrition time and of market-purchased goods for more time-intensive goods. There is a separate effect which may offset this substitution of market time and goods for home time and goods. Increased income which results from enhanced work may increase breastfeeding behavior if it is a normal good. Increased income also has a third effect-- a social pressure or "relative income effect." If richer persons are felt to look down at breastfeeding, or if, for any other reason, breastfeeding is viewed as being inferior to bottle or other types of infant feeding, then breastfeeding will decline as the value of time increases.

These effects of changes in the value of the father's and children's time or their total income are expected to lead to a reduction in breastfeeding behavior among the rich. For the poor, however, we feel the income effect requires that a subsistence income be met. Therefore, additional income would go for basic foodstuffs, and breastfeeding would be viewed as a necessity. For this poor group, income or price increases will have a much smaller impact because of these offsetting income and substitution effects.

Wealth represents a type of return to nonlabor income. It will capture pure income effects. If breastfeeding is the preferred form of infant feeding, then the effects of wealth will be positive on breastfeeding behavior. (The present value of all household wealth is used for our wealth parameter.) The effects of nonproductive assets are included so this parameter does not represent a pure income effect. The actual value for the father's and children's wages are used as one price variable and the combined income of household members, excluding the mother, as a second one. We had no basis for estimating the value of nonworking children's time, but the demographic parameters will capture the productivity effects of children of different ages and sexes.

Compatibility of the mother's job with child care. One of the most interesting differences between industrialized and less industrialized areas is the greater prevalence of jobs in the latter areas which allow the mother to be more responsive to childrearing needs in the lower income groups. Hours may be less rigid, the job may be located in the house, or there will be greater possibilities that the child can accompany the mother to the work site. It may be that the mother selects market-related jobs which are compatible with child care (for example, Brown 1970). Other anthropologists feel childrearing practices are adapted to the requirements of market labor (Nerlove 1974). The effect of the location of the job in relation to the house,

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travel time, or other job compatibility measures, such as the possibility of allowing the child to accompany the mother to her work site, will be included as exogenous parameters.² Compatible jobs allow the mother to supervise her older children or others who are engaging in childcare. For this reason we do not necessarily expect that compatible jobs will increase breastfeeding behavior. For working women, it may have the opposite effect of allowing them to allocate the time of others more efficiently.

This study does not allow us to examine the urban-rural differential effects of work on child welfare. Studies done on the relationship between labor force participation of women and fertility patterns indicate the female labor force effect on fertility is much greater in urban areas. We would expect that much of this urban effect relates to the greater incompatibility of urban jobs with childcare. Similarly, we would expect the effect of female labor force participation on urban children's welfare would be more significant.

Preference for breast- or bottlefeeding (belief patterns) Preference patterns can play a key role in breastfeeding behavior, especially for lower income households where economic necessity requires that the infant be breastfed. For higher income households, breastfeeding is not as necessary; moreover, many feel there is a higher status attributed to bottlefeeding in high income households. This may not be true and we may find a belief pattern effect very different from that found in lower income households. In general, we expect households in which breastfeeding is preferred to respond in a rational manner to changes in the value of time and unearned income; it would be possible, if the sample size were larger, to test this issue.

In this study, we test the concept that the preference for breastfeeding will be significant and will play a greater role in explaining the breastfeeding patterns of lower income households. The impact of preference on duration may be based on different beliefs. One interviewer reported that some Laguna mothers felt prolonged breastfeeding was not advisable. They felt the deteriorating taste of the mother's milk could result in a stunted personality. Another important effect would be the age at which solid foods are introduced to the child. There is clearly a positive relationship to breastfeeding time and duration in the sense that an early age of introduction shortens these parameters. The sample size for which weaning preferences are known was inadequate for a meaningful analysis.

²Compatibility of job was based mainly on a questionnaire given to each member of the field staff to determine the general compatibility of certain occupations with childcare. Some empirical testing was used to validate those groupings. For example, women who washed clothes or engaged in weaving were listed as working in jobs compatible with childcare. School teachers and itinerant saleswomen were placed in the incompatible category. It should be noted that several other indicators of job compatibility were tested. These include the location of the work in relation to the home, the time to travel to work, and the cost of traveling to work.

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The mother's education may play a big role in the age at which solid foods are introduced. We assume the introduction of solid foods is positively related to education. Consequently we hypothesize that there will be an inverse relationship between the education of the mother and her breastfeeding time and duration. Education can have other effects. For example, better-educated mothers have been shown to more efficiently use the childcare time of older children.

The idea that pregnant women should not breastfeed is a common belief pattern. Earlier studies have found that it was an important reason given by women for not breastfeeding. To analyze this pregnancy effect in a behavioral analysis, it is necessary to have a prospective study which follows the mother's behavior from month to month. The pregnancy effect should be studied by infant age groups similar to life-table studies on lactation behavior (for example, Osteria 1973) or in a lagged variable framework. It is not studied here.

Health status of the mother. Continued breastfeeding is a severe drain on the body of a woman. She loses weight, her nipples become cracked, she becomes anemic. Other health effects come from breast abscesses and maternal illnesses such as tuberculosis. Greater problems with health are to be expected in low income women. We hypothesize that less healthy women will be physically unable to continue breastfeeding as long as the healthier ones. (This health relationship may be hidden by a second, more psychologically related, let-down reflex factor mentioned later.) Since this health factor could not be studied properly without a detailed clinical examination, the income variable may capture part of it. The expected positive relationship between the health status of the mother and household income may reduce the size of a hypothesized inverse income effect since healthier women would be expected to breastfeed more. An anemia and a weight-for-height variable will be analyzed for their effects on maternal health status.

Some scholars have felt that maternal diet is an additional factor (Butz and De Vanzo 1973). We disagree; maternal malnutrition (not diet) affects the quality and quantity of the breastmilk and may also directly lead to the cessation of breastfeeding (for example, because of tuberculosis).

The health or nutritional status of the mother has an additional effect. Healthier women are likely to be more productive both in the marketplace and in the home. In a separate study it was found that the improved nutritional status of mothers (as measured by the percentage of their weight-for-height compared with the 90th percentile of the Telford standard) was associated in many cases with increased childcare time and household nutrient consumption (Popkin 1976). This productivity effect is not straightforward, however, as enhanced maternal nutritional status may be associated with greater productivity increases in market production relative to nonmarket

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production which would include childcare time. In such cases, the price of breastfeeding may increase relative to less time-intensive infant nutrition.

The parameters used are a zero-one dummy variable, where zero signifies the presence of, and one the absence of anemia, based on the WHO (World Health Organization) criteria for nonpregnant nonlactating mothers. These hemoglobin data were gathered with the use of a Sahlis hemoglobinometer by a Department of Health team at their central laboratory in Manila. Data were obtained for a subsample. An ordinary scale was used to collect the weight data. These data also exist for a subsample. Since use of all these data limits the sample size too much, we excluded the less meaningful weight-to-height parameter for some of the analysis.

Bottlemilk/milk industry effect. The following are often labeled as reasons for the decline in breastfeeding: The promotion of baby formulas and milk in hospitals, clinics, and doctors' offices; the manipulation of government and private medical personnel with gifts and samples of baby formulas; the use of paid wet nurses to pressure mothers to bottlefeed; the prejudices of medical personnel who believe bottlefeeding is best or who are paid to act as if this were the case; the status symbol of the movie star with firm breasts (breastfeeding is associated by many with sagging breasts); the distribution of free milk powder by international agencies to infants, which encourages a decline in breastfeeding; and the milk advertisements which promote bottlefeeding over breastfeeding (Greiner 1975, Jelliffe and Jelliffe 1975, Dwyer 1975).

Each of these factors occurs to some extent in the Philippines. It is unclear how important they are in affecting breastfeeding practice in the rural areas where usage of medical facilities and accessibility to advertising is less common. In part we are concerned with the price of milk—a price often affected by the actions of multinational corporations. In part, it is a change in preference (demand) fostered or forced upon society by the milk industry, medical professions, and many others. The effect would be expected to be strongest in urban and monetized areas with large private baby food or milk industries. In a special subsample, we found that 9 percent of 140 mothers with infants had been visited by milk company representatives. A 0-1 dummy variable is used to examine this effect in our subsample.

Let-down reflex or "milk ejection reflex". As described by Jelliffe and Jelliffe (1974), this is mainly a psychosomatic reflex. Anxiety, emotional tension, and stress and strain can inhibit this reflex, making the breast dry up. Although the woman is physically able to breastfeed, she is unable to eject milk. Mead (1964) has described situations in which the anxiety level of

*This variable and the ones following have not been used in our analysis. They are mentioned for discussion purposes only.

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the mother has been linked to this failure. In many societies a doula or female assistant—be she a mother, traditional midwife, friend, or helper—provides psychological support for the lactating woman (Jelliffe and Jelliffe 1974). In modern societies and in urban areas, such support is often not available. This may be one reason for the unexplained difference in breastfeeding behavior between urban and rural women in the Philippines found by Popkin and Solon (in press). It may also explain why urban mothers in previous Filipino breastfeeding studies gave no breastmilk as a prominent cause for the discontinuance of lactation (Del Mundo 1959).

No anxiety or psychological data are available and adequate proxy variables are not known. It would appear, however, that absence of the extended family support and urban residence are two factors that would be associated with a poorer let-down reflex. Thus the estimation of family size and urban effects may be biased by this effect.

Urbanization. Residence in urban areas has been a key factor used to explain the decline in breastfeeding. In urban areas, many women work at higher-paying jobs which do not allow breastfeeding, the home production value of time may be lower, the greater presence of milk industry advertising may discourage the continuance of breastfeeding (as noted earlier), the psychological stress and strain on the urban women is greater (see "Let-down reflex" effect above), and psychological support may be less available. It is unclear whether there is a pure urban effect. Most likely, urbanization is positively correlated with each of these adverse effects on breastfeeding. Thus, the use of an urbanization parameter without the inclusion of each of the other factors would give a more pronounced impact to the urban parameter. If so, the policies should be directed at women with these characteristics rather than at urban women in general. There is one possible and important urban effect. It may be that more goods which can substitute for breastmilk are available in urban areas; nevertheless, each of our rural barrios had at least one store which sold canned milk.

Multivariate analysis would allow the job and other socioeconomic and demographic factors to be analyzed separately from the urban effect; the let-down reflex and milk industry effects, however, cannot be adequately studied. Lack of adequate controls for these effects would bias an upwards urban effect. In the present study, urbanization is not studied but will be included in later work.

Contraceptive effect. It is often argued that any birth control pill with an estrogen component will interfere with or suppress lactation in women. Research on this issue shows that this effect occurs mainly among women who do not want to breastfeed. That is, "the results of these studies imply that expectation of suppressed lactation and refusal to let the child suckle may be at least as important in suppressing lactation as the estrogen compo-

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ment of combined pills" (Buchanan 1975, p. 59). For these reasons, we do not include an estrogen contraceptive effect in our analysis.*

Price of market-purchased goods. The ratio of the price of infant nutrition relative to other items purchased, and the ratio of the market goods component of breastmilk relative to other forms of infant nutrition, could be important parameters. Among our key group, ages 0-3 months, commercially purchased weaning foods or other solid foods appear to be unimportant. Also, it was not possible to develop a meaningful price index for each household or each barrio, so we could not compare the price of the market-purchased component of infant nutrition with the price of other types of infant food. We developed a milk price parameter for each barrio but there were large measurement problems which made this an unreliable measure and we found little use for it.

An alternate parameter is the proximity to a store which sells canned and powdered milk if this were a nonmarket subsistence region with few available stores. In Laguna, as in much of the Philippines, small sari-sari stores sell milk. There are about 280,000 of them in the country, and each of our sample barrios has several, so we did not use such a parameter. Shaefer reported that in Alaska a large difference in village fertility levels resulting from a lowered breastfeeding rate was directly related to the proximity of the nearest trading post which provided canned milk (Buchanan 1975).

The following multivariate analysis looks at the effects of the first seven of the listed independent parameters on the three dependent variables. The dependent variables, again, are 1) whether or not the mother breastfeeds the infant, 2) the minutes per day the child is breastfed during the age 0-3 month period, and 3) the number of months the child is breastfed.

*This estrogen-lactation issue is not settled. There has been a great deal of earlier evidence that high doses of estrogen administered shortly after delivery interfered with lactation. The greatest estrogen effect is felt to be on a diminished breast milk supply (for example, Chopra 1972). Another factor felt by some persons to be an important cause of cessation of breastfeeding is the pregnancy of the mother. This factor was examined but found to play an insignificant role in the Laguna sample population. In earlier studies of Philippine mothers, the pregnancy relationship given as a reason in recall analysis may not have been the basic cause. Pregnancy data were collected for the same period during which the mother ceased to breastfeed and no relationship was found. Such prospective data were available for a small sample only. We found pregnancy even increased the time of breastfeeding—most likely because pregnant mothers had more time. It is possible that a larger prospective study may clarify this relationship and show a stronger pregnancy effect.

**The causal linkage between breastfeeding behavior and the location of trading posts appears to be weak. Many other factors that could reduce lactation, such as income changes, might also be important in inducing a trading post to be located closer to a given village.

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NATURE OF THE DATA

Background

A survey of 576 households in 34 rural barrios in the province of Laguna was conducted during the period May-July 1975. Detailed cross-sectional information was collected on economic, demographic, and nutritional factors during five visits to each house. Data were collected (for other studies as well as this one) on breastfeeding, the nature and extent of female labor-force participation, and other household factors. The 34 barrios were selected to be representative of the major rural economic groupings of Laguna: Fishing, lowland and upland farming, and semi-urban industrialized. Household listings for all the barrios were made and random number tables were used to select households from each one.

Breastfeeding and bottlefeeding data for each child under the age of 3 were collected at the time of the survey. Additional data have been collected by revisiting 99 households in three separate visits. These revisits occurred about 4, 6, and 8 months after the completion of the original survey of the 576 households. During these three visits, actual breastfeeding behavior was observed for 2 days on the first visit and 1 day on the following two visits. An additional survey of over 250 sample households was made 7 months after the original data were collected. All of these sets of data were compiled to give us breastfeeding data on 314 infants. Since most of the demographic, socioeconomic, and other data were obtained in each revisit, it was possible to develop a larger file in which key independent parameters are in the same time frame as the appropriate dependent parameters.

The analysis on the 314 households was conducted for the participation and duration studies. The analysis of the time data was done on a smaller sample because some respondents could not answer this question properly. Since hemoglobin data are available for a more limited population, separate regressions were run to analyze the effect of this parameter. Similarly, the milk company visit data were available for a subsample and had to be explained in a separate regression.

Specific Forms

The specific forms of each variable examined in the following analysis are:

- Value of mother's time (Estimation from Appendix B, pesos per hour).
- Age/sex composition for all living children
 - Ages 1-6: The total number of other family children in this age group
 - Ages 7-12: 1) The total number of children; or 2) Small family—the number of children ages 7-12 in families with 1-3 children; medium family—the number of children ages 7-12 in families with 4-6 children;

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and large family—the number of children ages 7-12 in families with 7 or more children.

—Ages 13-15: 1) The number of girls in this age group, and 2) the number of boys in this age group.

—Others: The number of grandparents, other relatives, unrelated residents and servants living in this household.

- Value of time for others
 - Weekly wage of the father based on a weighted average of all his jobs and the annual total income of all children divided by their annual hours worked.
 - Net household income minus the income of the mother (which represents the total income of all others in the household) divided by the persons living one or more months during the last year in this household.
- Job compatibility (analyzed only for working mothers). The compatibility of the job with childcare requirements assigns a value of one to mothers with occupations which normally allow the child to accompany the mother during her work, and zero otherwise.
- Preferences—A question was asked about whether breastmilk or bottlemilk was felt by the mother to be better. A value of one was assigned when the mother felt breastmilk is better and zero when bottlemilk was felt to be better. Five percent of the mothers did not answer this question or their answers were ambiguous and had to be dropped from all analyses which includes this parameter.
- Health/nutritional status—The hemoglobin count of the mother was estimated by using a Sahlis hemoglobinometer. The WHO standard for maternal anemia (H_b below 12 mg/100 ml if not pregnant and 11 if pregnant) was used. The FAO/WHO standards for the ratio of weight to height were used (Jelliffe 1966). The percentage of the mother's weight-to-height ratio of the one hundredth percentile was used.
- Milk company pressure—Households visited by a milk company representative were given the value of one. All others were given a zero.

ANALYSIS

The mean and standard deviation for each of these parameters are presented in Table 1.

It is highly likely that upper and lower income persons react very differently to changes in factors endogenous to the household, such as income, education, beliefs, and age composition. Economic insecurity may force the

*Food and Agriculture Organization.

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Table 1
Key Parameters: Mean and Standard Deviation

Variation	Mean	Standard Deviation
Participation (0-3 months)	.93	0.26
Duration (months)	11.4	7.3
Time breastfeeding (0-3 months) (minutes)	80.6	72.9
Mothers value of time (estimated weekly)	₱ 21.13	25.5
Beliefs breastfeeding (percent positive)	.95	.20
Income, other, per capita (annual)	₱624	1523
Father's wage (weekly)	₱ 59.65	103.28
Children's total wage (hourly)	₱ 0.22	1.36
Wealth (total)	₱6178	15225
Children 1-6 total	1.94	0.98
7-12 total	1.17	1.21
7-12 small family	0.03	.21
7-12 medium family	0.68	1.03
7-12 large family	0.46	0.99
13-15 female	0.15	0.44
13-15 male	0.27	0.51
Anemia-none (0-1)	0.07	.26
Percent weight/height mother	90.7	12.8
Visit, milk company (0-1)	0.09	0.28

poor household to follow a different expenditure and time allocation pattern. Below the threshold income, the family may work to maximize income. This may mean there is a greater necessity to breastfeed for the group.

Wealth is used to divide the sample. Wealth relates not only to the flow of income from land, water buffalo, tools, and other productive assets but also represents the closest approximation to class stratification possible with a highly heterogeneous sample. The sample is split into the lower 70 percent and the upper 30 percent according to this wealth parameter. For convenience, all households with wealth of less than ₱5000 are termed poor and the others, rich. Elsewhere, the time-allocation and food-consumption patterns, and the factors responsible for these patterns, were found to be very dif-

*Philippine peso: ₱ 7.03 = US \$1.

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ferent for a rich and poor group. We expect these differences to allow us to clarify many effects in breastfeeding behavior associated with changes in the economic, belief, and other independent variables. Given the small sample size, we were unable to stratify for all of the analysis. Only a set of participation and duration regressions on the stratified sample could be presented.

Who Breastfeeds

Better educated and lower income persons were more likely to breastfeed their children. Among the 314 sample children, 33 percent were breastfed. In the age group 4-6 months, 88 percent were still being breastfed; by the age of 12 months, 77 percent continued to be breastfed. When the sample was split into those mothers who did and did not breastfeed their children, the income and educational differences between the two groups were found to be significant. Total household income, for example, was twice as high in the "did not breastfeed" group, while education of the mother was 3.2 years for this group, versus 2.6 years for the other.

The key relationships between the socioeconomic preference and demographic parameters and breastfeeding participation were examined in a multivariate framework. In the overall samples, the preference, demographic, and income/value of time effects were all significant, but these effects were seen to operate very differently for rich and poor households. For the poor, the belief and demographic effects are primarily responsible for participation variations while the economic value of time and demographic relationships are more central for the rich. First, the mother's parameters are examined.

Mother's parameters. In the total population, positive breastfeeding preferences are associated with a 20 percent greater probability of breastfeeding. This effect is much stronger for the poor. This is indicative of the necessity of breastfeeding among this group and the greater likelihood that breastfeeding will and must occur if the mother feels it is best for her child. An inverse significant relationship between positive beliefs and breastfeeding among the rich is difficult to explain. This may relate to a second-order correlation between the preference pattern, education, and value of time relationships: Rich women with a positive preference pattern may have a higher market value of time and may work more; or this may be associated with the problem of having a small sample size which precludes an analysis of meaningful variances in the breastfeeding behavior of the rich.

The preference pattern of the mother is not correlated with her education level; in fact, the Pearson correlation coefficient between these parameters is .014. Though the education levels of the mothers are significantly correlated with their breastfeeding participation ($r = .05$), the relationship is not linear; the percentage of breastfeeding rises from 82 percent for the first group (no education or primary undergraduate) to 96 percent for the next

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two groups (intermediate undergraduate and graduate), and then drops to 92 percent for those with secondary and higher education. The significant increase in participation between those mothers with no education and the other educational levels is most noteworthy.

Increases in the estimated market wage of the mother are associated with reduced breastfeeding participation in the total sample. This effect is most significant for rich mothers. For the poor, an insignificant relationship occurs. This follows the threshold wealth hypothesis laid out above (Encarnacion 1974): that is, the poor must breastfeed because all additional income must go to meet their subsistence needs. Thus, a lower wage rate must lead to increased work and less home time, and the opposite, an increased wage rate, would allow them to work less. On the other hand, rich women are more likely to work as the market value of their time increases and time spent in childcare becomes more costly.

The compatibility of a job with childcare can be associated with either an increase or decrease in breastfeeding behavior. In the total sample, there is an insignificant positive relationship. The strength of the relationship is not as strong as was found in earlier research on this relationship in Cebu (Popkin and Solon, unpublished). In this study, 100 percent of women with compatible jobs breastfed as opposed to 96 percent of those with incompatible jobs; the relationship is inversely related to the proximity of the job to the house—in home or nearby, 100 percent; same barrio, 97 percent; elsewhere, 93 percent. Regressions were run on this for poor working mothers to attempt to separate the many relationships between the compatibility parameter, the other variables, and breastfeeding participation.

The results for the working poor are presented in Table 2. They indicate that a good job which is compatible with childcare is associated with reduced breastfeeding. This relates to the supervision effect of a compatible job. Compatible jobs of poor working mothers are associated with a significant increase in the childcare time contributed by older children (Popkin 1976). Moreover, it is highly likely that girls ages 13-15 are the ones supervised by these mothers. A similar regression could not be run for rich working women because the variance-covariance matrix could not be inverted.

We find that healthier mothers breastfeed more often. The relationship is not significant, however. The sample size is too small to examine these health relationships in more detail for the nonlactating mothers. Of those mothers who did not breastfeed, 78 percent said the reason was related either to health factors or their inability to produce breast milk. Six percent said they were advised by medical personnel not to breastfeed, and 16 percent said the baby did not want to breastfeed. We find these answers different from the behavioral relationships uncovered when the role of the mother's parameters is evaluated with the other household parameters. This

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Table 2
 Regression: Factors Associated
 With Breastfeeding Participation for Working Poor Mother
 Dependent Variable: Breastfeeding Participation at Age 1 Month (0-1)*

	Working Poor
Constant	₱ 1.00
Preferences for breastfeeding	-0.05 (-.40)
Children aged 1-6	.006 (.25)
Children aged 7-12	.01 (.65)
Girls aged 13-15	-.21** (-4.55)
Boys aged 13-15	-0.04 (-.52)
Others	.48 (1.13)
Wealth (₱1000 units)	.018 (.97)
Incomes of others per capita (₱100 units)	-0.003 (-.98)
Predicted wage of mother (₱)	.006 (.19)
Good job (1=good job, 0=otherwise)	-.07 (1.34)††
R ²	.24
F-test	2.87
Number of cases	103

(T-test in parentheses; significance: ** = 1%, † = 5%; †† = 10%.)

*When a 0-1 dependent variable is used, certain statistical problems can occur. First, the coefficients of the independent parameters can lead to interpretations outside the 0-1 range of the participation dependent variable. Also the residual may exhibit heteroskedasticity and the standard T-ratio may be incorrect (Theil 1971). Studies have shown that ordinary least squares regressions can be used without these effects occurring (Gunderson 1972). Since our results in regressions 1-4 appear well-behaved, we do not use alternate and more cumbersome estimation procedures here. An alternate probit model is expensive to run and cumbersome to interpret. In a few instances the predicted value for regressions 7 and 8 will fall outside the 0-1 probability range, but this was found to occur in very few cases, so probit was not utilized.

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may indicate that studies which concentrate on asking why, rather than analyzing the relationship, may be incorrect.

Other economic and demographic parameters. The income of other household members is inversely related to breastfeeding practices, but the stratification of the sample into rich and poor produces insignificant relationships. Similarly, increases in the wage of the father and children are negatively related with breastfeeding participation. The effects for the rich and poor subsample are insignificant. A larger sample should clear up these relationships.

The demographic relationships are clearer. The presence of additional preschool children increases the need for, and productivity of, the mother in childcare. Thus, it is not surprising that increases in breastfeeding are significantly associated with additional preschool children in the total and rich and poor samples. The effect is larger in the rich subsample, which may mean that they are more aware of these joint relationships or even space their children to allow childcare of several children at once. This fits the threshold idea that breastfeeding behavior among the rich relates more to their relative productivity in market and nonmarket activities.

The presence of girls ages 13-15 has an important effect on the childcare time of mothers. For the poor, they act as mother substitutes, while for the rich their presence is associated with increased childcare time by the mother and reduced total childcare time by older children.

The addition of other household members has no effect on the total sample, but disaggregation shows that the addition of others significantly increases the breastfeeding practice of poor mothers. In the study of childcare practices, we found that the addition of other household members had a negative though insignificant effect on childcare time by the poor nonworking mothers and a positive insignificant effect on the childcare time of poor working mothers. It follows that the presence of others could allow the poor working mothers to reallocate their time toward childcare (including breastfeeding) and allow the nonworking mothers more time for preferred interests such as breastfeeding. It is possible that the others provide other, more direct influences on breastfeeding. They may promote traditional child-rearing practices or provide comfort so that the mother is more confident about her ability to breastfeed (doula effect).

The final relationship is the impact of visits of milk company representatives on breastfeeding practices. Over 9 percent of the sample were visited by these company representatives; their impact on the small sample for which these data were available was insignificant. Moreover, instead of the hypothesized negative effect, we find a positive one, which may be because this analysis controls for many of the preference, economic, and demographic parameters that cloud this relationship in most other studies. Or the

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impact of milk companies in rural areas might be different because they do not produce the multitude of inhibitions and other problems noted in other studies (for example, Dwyer 1975, Greiner 1975).

Duration of Breastfeeding

The mean length of breastfeeding is 11.4 months, with a standard deviation of 7.3 months. The factors affecting duration are similar to those associated with the participation parameter except that children ages 7-12 and other household members play a more major role. The income relationships were expected though they are less significant. This type of analysis can be more readily interpreted when the behavior of only breastfeeding mothers is analyzed.

Mother's parameters. Increases in the mother's wage are related to decreases in duration of breastfeeding for the total sample, but the effects are insignificant in the stratified groups. The belief (preference) parameter has an impact similar to that found in the participation analysis. The positive association for the poor was large and highly significant. The mother's education, on the other hand, had a different effect: Women with at least a secondary education breastfeed for significantly fewer months (9.5) than the others in the sample: No education or primary undergraduate, 11.4; intermediate undergraduate, 11.5; intermediate graduate, 11.2. This may relate to more understanding of the needs of older infants for solid foods and the resultant decline in breastfeeding behavior. The other key personal characteristic is the mother's nutritional status. A large positive though insignificant effect of not having anemia is found.

It might be expected that a compatible job might have a positive impact on duration because the mother could easily continue to breastfeed if her job allows her to come home. For the total sample, we find an insignificant relationship between tabular analysis of this relationship and our duration parameter. In Table 3 we present regression results which indicate that the compatible job effect of poor working mothers has the same unexpected relationship to duration as was found in the participation analysis. The reasons for this are the same. A compatible job allows the poor working mother to supervise her older daughters who, in turn, take care of the young child.

Other economic and demographic parameters. For the total sample in Table 3, the income per capita of "others" is significantly and inversely related to the duration of breastfeeding, but the parameter is insignificant in the stratified sample. Increases in the father's wage are significantly related to reduced duration in the rich households. The wealth parameter has a

*T-test at .09 level.

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Table 3
Regression: Factors Associated with Duration of Breastfeeding for the Working Poor

Dependent Variable: Months Breastfeed

Independent Parameters	
Constant	5.76
Beliefs (0-1)	4.48 (1.22)
Children 1-6	0.58 (.84)
Children 7-12	5.32
Small family	(1.67)**
Children 7-12	0.15
Medium family	(0.04)
Children 7-12	0.71
Large family	(.84)
Females 13-15	-2.76 (2.15)**
Males 13-15	3.43 (1.54)***
Others	-.20 (.21)
Wealth (₱1000)	0.49 (.93)
Predicted wage of mother (₱)	-1.30 (.21)
Income of others (₱100)	-.01 (.21)
Compatible job	-2.43 (1.60)***
R ²	.21
F	1.94
Number of cases	103

(T-test in parentheses; significance: * = 1%, ** = 5%, *** = 10%.)

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meaningful effect of the rich households, which may indicate that the households perceive breastfeeding as a normal good.

The demographic relationships are interesting in that the presence of children ages 7-12 has a significant positive impact on the breastfeeding duration of poor mothers. The presence of children ages 1-6 and 13-15 had the same impact on duration as they had on participation. For the total sample, only children ages 1-6 and 7-12 exhibit a significant uncontrolled effect. In the multivariate analysis, however, we find the effect of the presence of children ages 7-12 is significant only for the poor. This can be linked with the childcare time analysis which showed that presence of children ages 7-12 in poor households was significantly associated with reduced per capita childcare time of the poor nonworking mother and increased childcare time for the working mothers (Popkin 1976). Females ages 7-12 substituted for working mothers in nonchildcare home production time, while for nonworking mothers direct childcare substitution appears more prominent (personal communication, Bryan Boulier). Thus it is easy to see how substitution between the group ages 7-12 and poor working and nonworking mothers can lead, for different reasons, to a prolonged period of breastfeeding.

The presence of other persons had a significant negative effect on the duration of breastfeeding of rich women. In the childcare time analysis, the addition of others was associated with a significant reduction in the childcare time of nonworking rich mothers. Since there were very few servants, grandparents, other relatives, or unrelated residents in separate categories, this parameter was not disaggregated.

The milk company visit effect is large but insignificant. It is surprisingly positively associated with an increase in the duration of breastfeeding among the rural sample.

Time Spent Per Day Breastfeeding

It is most difficult to explain the time spent breastfeeding. Time data obtained by recall have a wide error level. The recall time data had a mean of 81 minutes versus the more accurate observation time of 34 minutes. Nevertheless, we were able to derive several significant and interesting relationships—relationships which can be accepted if we assume that the error in the recall data is not systematically correlated with any of our independent parameters. Given the potentially large error level in this time recall data, we feel it is more valuable to be concerned with the relative time effects rather than the absolute effects of each equation. The sample size with time data was too small to allow any meaningful analysis of separate regressions for rich and poor samples.

The belief effect was found to have no effect on time spent breastfeeding. It was replaced by the mother's education level, and a strong inverse rela-

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relationship between education was found in all the regressions but not in a one-way analysis of variance. The mother's predicted wage also had a strong inverse association with breastfeeding time. For each additional P10 earned in a week, the mother would reduce her breastfeeding time by 18 minutes or about 22 percent of her total breastfeeding time. The nutritional status effect was large but insignificant. Both the education and wage relationships can be indicative of the possible increased market productivity of the mother relative to her home productivity. For this reason, we must be careful not to interpret the education parameter as the only preference variable. Education may also indicate nonmarket activity, in which case increased education could be associated with reduced breastfeeding time as the poor mother may be better able to breastfeed her child quickly.

The age composition effects are interesting. Only children ages 7-12 from middle-sized families are associated with more time breastfeeding. In smaller and larger families, additional children in this 7-12 age group are associated with reduced time spent breastfeeding. Additional female children in the 13-15 age groups are also inversely but insignificantly associated with the time spent breastfeeding. In a *F*-test on these age composition relationships, the time differences are insignificant. Only in the more controlled multivariate analysis are the effects statistically significant.

The milk company effect was significant. Being visited by a milk company is associated with a large reduction in breastfeeding time of almost 47 minutes or over half of the total breastfeeding time, all other things being equal. This may indicate that the milk company personnel were able to induce mothers not to breastfeed their children, though we have no evidence on this. Data on the age at which mixed feeding began were considered to be too inaccurate to be analyzed.

DISCUSSION

The analysis has shown that the preference, economic, and demographic factors have major effects on breastfeeding behavior. The preference pattern analyzed is a simple one and it will be necessary to conduct more detailed research on this issue before meaningful programs can be developed which would attempt to change preferences. Formal education is clearly not as important as the many other factors that go into forming preferences. Moreover, increases in the level of education had an effect different from the preference effect on the duration of breastfeeding.

It is useful to compare the effect of changes in these various parameters on the breastfeeding participation and duration variables for the rich and poor households. We estimated these predicted parameters for an average rich and poor household with an infant and child ages 4-9, and the average wealth, mother's wage, and income of others for the rich and poor groups.

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We find that the rich have a lower probability of breastfeeding and will do so for a shorter time. The most meaningful family composition change is the addition of a 14-year-old girl. This leads to a large reduction in the breastfeeding probability of the poor and a much shorter period of breastfeeding. For the rich, breastfeeding increases occur with an extra girl in this age group. Changes in the belief parameter have by far the greatest impact while the economic changes have a minimal impact.

The only way to compare the benefits to be gained by economic and education programs is to compare the benefits with costs for specific economic and education programs. If we are only concerned with breastfeeding effects, programs which attempt to enhance the wage of the mother at the expense of the income of other household members appear very expensive.

Economic change provides many other benefits which certainly should not be ignored. Still, the effects of income or wage increases on the poor are mixed. Consequently, the provision of education programs for the poor looks more feasible. Certainly such programs could produce a large effect on breastfeeding behavior.

Other potential programs relate to the creation of jobs which would allow breastfeeding practices to continue while the mother is working. This analysis of rural households indicates that jobs compatible with childcare would not necessarily lead to meaningful increases in breastfeeding as was hypothesized in earlier work (Popkin and Solon, in press). Here we found an allocative effect in that working mothers with compatible jobs are able to get their older children to take over more childcare activities which include bottlefeeding activities.

An analysis of the urban relationships and a comparison of these Laguna findings with similar research from other regions in the Philippines are necessary before we can have more faith in the applicability of these results. If Laguna province is much richer than other Filipino provinces, as it appears to be, then the findings related to the poor group may be more relevant for other provinces. In this case, the encouragement of positive preference patterns may be more important than the provision of more compatible jobs. The analysis is based on a small sample size so we must be careful in interpreting these relationships.

CONCLUSION

This study has confirmed that certain economic, preference, and demographic parameters have a strong effect on breastfeeding behavior of rural women. It has presented evidence to suggest that compatibility of the mother's job with childcare may be important for breastfeeding behavior and that the milk company effect of breastfeeding participation and duration may

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not be important in the rural Filipino communities studied. The study has been conducted in rural communities where most mothers breastfeed. Similar research in other Filipino rural and urban communities is necessary to understand more fully the role of each factor studied here plus many others which could not be explored in depth because of the small size of the sample population

Appendix A

The Infant Nutrition Model

Infant nutrition can be viewed as a direct welfare commodity which can be produced by either bottle- or breastfeeding of the infant, or a combination of both processes. Both time and goods are required for each process and there are an infinite number of combinations of breast- and bottlefeeding for a given amount of infant nutrition. At the same time, there is a limited range for household expansion of the production of infant nutrition because of the biological limitations of both the infant's stomach and the mother's breastmilk supply, and there are limitations on the mother's time as well.* There is a basis, however, for developing a production surface for infant nutrition. A traditional household economics model, based on a utility function U , is then used to lay out the basic relationship studied here. According to this model, households maximize infant nutrition N and a composite commodity of all other items desired by the household.

Thus,

$$U = U(N, Z) \tag{1}$$

where N stands for infant nutrition and Z is a composite of all other consumables desired by the household. One component of Z is M or times the amount of each item used must be less than the full household income laid out in (3). These prices, π_n , and π_z , reflect both the prices of goods and time components:

$$N\pi_n + Z\pi_z \leq \sum_i \sum_j W_j t_{ij} + A \tag{3}$$

$$\pi_n = \sum_i P_i X_i - \sum_i \sum_j W_j t_{ij} \tag{4a}$$

$$\pi_z = P_z X_z + \sum_j W_j t_{0j} \tag{4b}$$

$$\sum_i t_{ij} = T_j \tag{5}$$

*Breast milk banks exist in some countries and a series of these banks may be developed in the United States. Also, wet nurses are used in some countries to substitute for (or supplement) the mother's milk. The latter practice is rare in the Philippines.

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Where

A	= nonlabor (unearned) household income,
W_j	= weighted average value of time for person j (j = mother, father, others in the household),
T_{jk}	= total productive time for person j in producing k (k = N, Z).
π_n	= shadow price per unit of infant nutrition (N),
π_z	= shadow price per unit of composite commodity Z,
N, Z	= number of units of N and Z,
P_i	= the price per unit of market good X_i (i = 1, 2, 3),
t_{ij}	= the time per unit of producing and consuming item i by person j, and
W_{ij}	= the value of time of person j in producing item i.

This full income constraint considers the possible substitution between the time of the mother and other household members in the maternal nutritional status, the role of which will become clear later. Biologically, the infant can be fed a limited amount of food and we assume the household desires to minimize its cost in reaching this level of N. N is comprised of breastmilk and bottled milk.* The household production function N has the following components:

$$N = f(X_1, X_2, X_3, t_1, t_2, t_3) \quad (2)$$

where X_1 is the market purchased vector of goods needed for breastfeeding. Included in X_1 are foods required to support the lactation needs of the mother. X_2 is a vector of goods purchased for bottlefeeding, such as cow's milk in whatever form it is used, and the various utensils required for preparing and feeding this food. The time used for breastfeeding is represented by t_1 , while t_2 is the time for bottlefeeding. These time variables include the purchasing, preparation and feeding components. X_3 and t_3 are the inputs for goods and time, respectively, for other food fed the infant. Similarly, Z is produced by a combination of goods and time.

The household desires to maximize its utility (Eq. 1), subject to its resource constraint. Thus, the shadow prices π_n of N, and π_z of Z times the amount of each item used must be less than the full household income laid out in (Eq. 3). These prices, π_n and π_z , reflect both the prices of foods and time components. This full income constraint considers the possible substitutes between the time of the mother and other household members in the

*Health and other familial inputs clearly affect child nutritional status. For this study, we consider only the direct food and food-related time inputs.
By having N stand for the nutrition of the infant, we bypass the very difficult question of intrahousehold distribution of nutrition or any other good.

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production of bottled milk, other infant food, and the composite Z commodity. For breastfeeding, only the mother's time is involved.

Both goods and time are limiting in the sense that a minimal amount of each is necessary to produce it. For example, little of the mother's time would be needed to bottlefeed if a maid were used; nevertheless some supervision time would be necessary. Similarly, a mother may breastfeed without purchasing lactation food; however, she will deplete her nutritional stores quickly. Since maternal nutrition (M) is part of our Z commodity, we must assume the mother will not deplete her nutritional stores. In other words, the mother will purchase some lactation food ($P_1 X_1 > 0$).

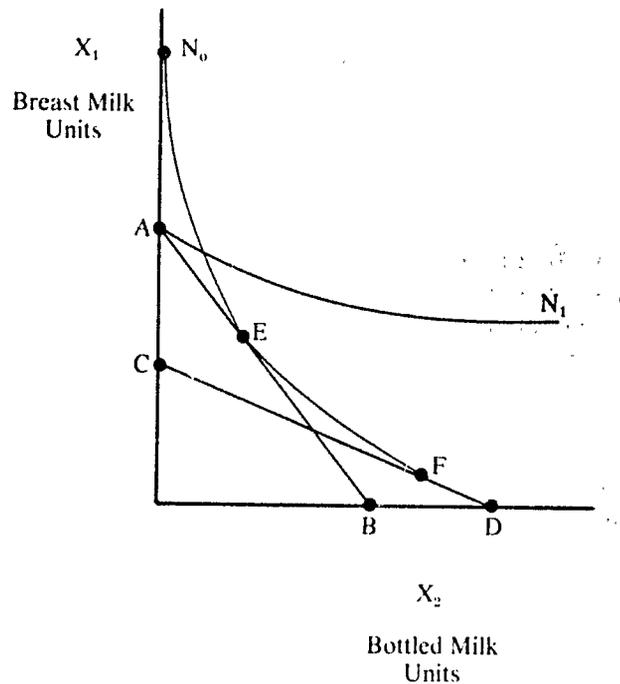
In the sample studied, breastfeeding requires relatively more time per output of child nutrition as compared to bottlefeeding, and bottlefeeding requires more market goods per output. Based on direct observation, 33 sample mothers breastfed their children 6-10 times per day and spent an average of about 34 minutes during the day breastfeeding the child. The time and frequency for breastfeeding diminish as the child gets older. On the other hand, bottlefeeding requires only about 17 minutes per day. The money cost of bottlefeeding ($P_1 X_1$) is greater than that of breastfeeding ($P_1 X_1$) but the opportunity cost of breastfeeding ($W_0 t m_1$) is greater than bottlefeeding ($\Sigma W_2 t_2$) since it can be assumed the mother will bottlefeed if her time is less valuable than that of the other persons who would bottlefeed her child. We are most interested in the way changes in the value of the mother's time and her belief patterns may affect her decision to breast- or bottlefeed.

Effects of Changes in the Value of the Mother's Time

The mother is the only person who breastfeeds the infant in the study areas. As the value of her time in market-related production increases, it is more likely that the working mother will substitute market goods for home production time (Becker 1965). This will mean that she may switch from breast- to bottlefeeding and/or reallocate her purchases of other items (X_2) to spend less time on the nonmarket produced elements of this Z -vector. We assume the mother wishes to minimize the cost π_n of producing N . When goods are substituted for the mother's time, bottled milk and/or other foodstuffs will replace the mother's breast milk as sources of infant nutrition.

If we assume no X_1 is consumed by the infant, the production-cost minimization relationship for N can be viewed in Figure 1. N_n is desired level of child nutrition. There is a high degree of substitutability between X_1 and X_2 ; they are obviously not perfect substitutes, however. If they were, the isoquant would be a straight line and there would be only corner solutions

Figure 1.
Production of Infant Nutrition



with no mixed feeding. For many, but not all households, a corner solution is clearly the case. AB is the isocost line for a mother with a low value of time and CD is the cost curve for a woman with a high value of time. An isocost curve represents all the combinations of X_1 and X_2 which can be purchased for a given price for X_1 and X_2 with a set resource level. If total resources equal T , point A equals T divided by the full price ($P_1X_1 + tm_1W_{m1}$) for X_1 . Thus as the cost of X_1 increases, the household obtains less X_1 for the same amount of resources. The equilibrium for mothers with a low value of time is point E where N consists mainly of breastmilk. For a high value of the mother's time, equilibrium may be at point F .

Beliefs or Preferences

The preference pattern of a mother may affect her perception of the production relationship between X_1 and X_2 , which was represented in Figure 1 by N_0 . If the true value of the mother's time leads to isocost curve AB and

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the true production relationship is N_0 , the child will be fed both X_1 and X_2 . If the perceived production relationship were N_1 , then the child would be fed only X_1 .

Appendix B

Calculation of Mother's Value of Time

The value of the mother's time (W_m) relates to the value of her marginal product at market and home activities. This value of her marginal product is determined mainly by the price of the goods produced, the other factor inputs, and the characteristics of the production relationship studied. Since appropriate valuations of home production outputs are unavailable, we use the value of the market output of women who work to estimate a market value of time for each person. Moreover, since the mother's occupations are heterogeneous and data are unavailable for estimating the direct production functions for all the necessary maternal market activities, we must use indirect measures to estimate the market value of the mother's time.

To estimate this wage variable, we use factors which relate to the productivity of the mother, such as her age and education, the wealth of the household, and the income of others. The latter economic parameters can help the mother be more productive, finance her working, give her more freedom to search for better positions, and even give her a better set of contacts. Dummy variables for the presence of rice, livestock, and crop income are partially measurement correction factors and help to adjust for labor market differences. The dependent variable is the log of wages since the distribution of wages tends to approach a log normal density function in most societies.

The working mother's predicted wage was based on an estimation using the following equation for working mothers:

$$\begin{aligned}
 \text{Log Wage Mother} = & -.81 + .018 \text{ income others}/100 + .47 \text{ rice households (0-1)} \\
 & \quad (2.24) \quad \quad \quad (2.61) \\
 & -.20 \text{ crop households (0-1)} \quad + .53 \text{ livestock households (0-1)} \\
 & \quad (1.11) \quad \quad \quad (2.84) \\
 & + .009 \text{ age mother}/100 \quad \quad \quad -.0097 \text{ age}^2 \text{ mother}/10,000 \\
 & \quad (0) \quad \quad \quad (1.27) \\
 & -.22 \text{ EDUCM} \quad + .062 \text{ EDUCM} \times \text{age mother}/100 \\
 & \quad (1.16) \quad \quad \quad (1.66) \\
 & -.0009 \text{ WEALTH} \quad \quad \quad R^2 = .08 \quad F = 3.2 \\
 & \quad (1.15)
 \end{aligned}$$

(t = value in parentheses)

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Children's Influence on Household Economic Activity in Laguna, Philippines

Bryan Boulier

Abstract

In this study, the investigator estimates the effects of children's economic contributions on parents' allocation of time for income-earning activities, care of preschool children, nonincome home production, and leisure activities. He finds that children within the Philippine province of Laguna contribute substantially to family income, play an important role in nonincome home production and childcare activities, and that these activities have considerable influence over parents' allocation of time.

It is widely believed that high fertility in rural areas of developing countries arises from the fact that, on the average, the benefits to parents from having births are relatively great and the costs relatively low, at least up to some large number of births. The benefits of births include the psychological satisfaction that parents derive from having births⁴ and living children, as well as the economic contributions of children to household output. These economic contributions include performance of household chores, additions to family income from market activity, and provision of financial security in

Note. ICD social scientist James M. Creager helped prepare this report for publication. Correspondence to Dr. Boulier may be directed to the School of Economics, University of the Philippines, Diliman, Quezon City 3004, Philippines.

⁴The psychological satisfactions from childbearing are influenced by social norms. Not all psychological satisfactions come from playing with and watching the growth of living children. Satisfaction may come solely from childbirth if society awards prestige to demonstrated fecundity. It is also possible for the net psychological satisfactions of children to be negative since not all births are wanted births.

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parents' old age or when parents are otherwise unable to work.* The costs of children include direct monetary outlays as well as the opportunity costs of time in bearing and raising children.

There has been much research examining the psychological and economic rewards and costs of children. No attempt will be made in this paper to review the literature. The series of volumes edited by J. T. Fawcett, including one on the Philippines by Rodolfo A. Bulatao (1975), provides an excellent introduction to studies attempting to assess the perceived or psychological value of children to parents. B. White's (1975) study of the activities of children in Indonesia contains a good survey of the literature on the economic costs and benefits of children, and Moni Nag (1975) gives a summary of White's Indonesian findings and those by C. Peet for Nepal and C. Espeland for Peru.** Nag's (1975) summary of these last three studies concludes that "the work input by children under age 15 in the Javanese, Nepalese, and Peruvian villages is quite substantial . . . [and that] . . . at the current rates of reproduction and under the present circumstances, children most probably have net positive economic value to their parents in these villages, aside from the old-age security provided by them to their parents." (p. 54)

The purpose of this paper is to present some preliminary findings on the impact of children on household economic activity in Laguna province, Philippines. The findings are preliminary in two ways. First, they consist of the initial analysis of the data. Second, they are only part of a larger project to assess the economic benefits and costs of children to the survey households.†

FAMILY TIME ALLOCATION AND INCOME CONTRIBUTION

Detailed estimates were made of the time and income contributions of family members for all survey households, and separately for farm and nonfarm families. (Data for children are the time and income of sons and daughters of the head of the household for children still living in the household.) A farm family is defined as one which has any income from crops, excluding home gardens (plots of land less than 200 square meters), or in which any family member reports time working in crop cultivation in the last month before the survey data.

*In terms of old-age security, children may be relatively poor investments if the rate of return is very low, especially under conditions of high mortality for parents and children. In the presence of imperfect capital markets, however, children may be virtually the only investments available for financing old-age security.

**See Espenshade (1973) for a survey of attempts to measure the costs of children in more developed countries.

†Households in the sample were chosen by simple random sampling from household lists prepared for 34 rural barrios selected to give a mixture of household economic activities (for example, fishing barrios and rice cultivation barrios).

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Data

The time allocation data are estimates of average hours worked per week in the year preceding the date of the survey. They are prepared from mothers' and fathers' responses to questions about time spent by family members in a variety of activities.

For crop cultivation and fishing, average hours per week were calculated by multiplying the average number of hours per day spent in the activity in the past month by the number of days worked, and dividing by 4.35 weeks per month. The last month is assumed to be a typical month for the purpose of converting these data to average hours worked in the past year. May, June, and July are months of relatively intense activity of crop cultivation in the Philippines, so that estimates of time spent in crop cultivation are probably overstated. On the other hand, the time of children devoted to economic activity may be somewhat understated since school begins in June. A similar procedure was used for time involved in caring for livestock and poultry, for which questions asked minutes per day and days worked in the last month. For wage-earning time and time spent engaged in a profession, the number of hours worked per week in the last month was the basic unit, while for business activities, the number of days worked per week in the last month was the basic unit. Time spent in income-producing home production was summed from responses to questions about hours worked in the past week devoted to home gardening, washing and ironing for sale, furniture making and handicrafts, food preservation for sale, woven crafts, and other activities. Together these activities are denoted "work time," even though some of the time in crop cultivation, poultry and livestock care, fishing, and gardening is really time devoted to production for home consumption.

Childcare time is time devoted to feeding, bathing and dressing, and cuddling and watching infants (ages 0-2) and other preschool children. Nonincome home production time is time spent in the last week in the following activities: Marketing of food, washing dishes, cleaning house and yard, cooking and preparing food, other feeding time, washing and ironing clothes, getting water and firewood, and mending, sewing, or repairing children's clothes.

All home production time (income and nonincome) and childcare time data are taken from questionnaires given to mothers. Other income-earning time data are taken from fathers' questionnaires. Questionnaires were checked to eliminate duplication in the reporting of time (for example, weaving reported as home production by mothers and as business time by fathers). When such duplication occurred, mothers' reports of their own time and children's time were used.

Several questions may be raised about the accuracy and interpretation of the time data. The first question is whether retrospective reports of time are

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accurate. In a second phase of the Laguna project, 100 households were interviewed three times at approximately two-and-one-half-month intervals. The interviews included a two-day observation of time allocation. Although the processing of these data is not completed, preliminary tabulations suggest that the data from the second phase are not inconsistent with those from the first survey, giving one somewhat more confidence in the rough estimates reported in this paper. A second question relates to joint activities, that is, is it possible for a person to be engaged in two or more activities simultaneously? For instance, a woman might tend a small store and watch children at the same time, or a woman might report 30 hours a week cuddling and watching infants and 30 hours cuddling and watching other preschool children. In the latter case, the woman could have spent between 30 and 60 hours watching children. Lacking data to resolve these questions, we have no choice but to assume that all times are additive.

An attempt was also made to estimate income earned by each individual residing in the household. Incomes from wages, business, and professions, and net income from home production for sale were identified by individual in the original questionnaire. (Later in this paper, estimates of production for own use or consumption are also presented.) To allocate income from home gardening, the value of gross output was multiplied by the share of the individual's time in total household time devoted to gardening. This procedure assumes that all persons are equally productive in gardening.

For crop cultivation, livestock and poultry production, and fishing, an individual's income was measured by the number of days worked in the last month multiplied by the average wage per day if someone else had to be paid to do the activity (times 12 months). This procedure has several difficulties. First, respondents may have difficulty in calculating the replacement cost of an individual's time. The data do look reasonable, however. For mothers, fathers, and older children, the implied hourly wage rates are similar to wage rates for adult hired labor, and wage rates for younger children are somewhat lower than those for older children. Second, the time spent by an individual in the care of livestock and poultry may be as little as 15 minutes a day. In reporting the replacement cost of this time, respondents may be unable to conceive of hiring labor for such short periods if laborers are typically hired in half-day or full-day units; or respondents may include in the replacement cost some compensation spent for commuting time by hired

*Contributions of nonfamily household members to household income earning time and to household income are quite small. For all households taken together, "others" contribute 1.90 hours per week to nonincome home production, .47 hour to income-producing home production, and .46 hour to child care. The average number of other persons per household is .44.

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laborers. Evidence of the problems raised here is revealed in an examination of implied hourly wage rates for the care of livestock and poultry. For durations up to an hour, the implied hourly wage rate decreases with increasing duration of time. Although there are measurement problems using this approach, without compensating for commuting, the replacement cost procedure does provide an estimate of the value of the marginal product of family members' time.⁴

Finally, it should be noted that this procedure leaves out unallocated income such as rent, interest and dividends, gifts, and other income which accrues to the household as a whole.

Results

In this section, we present some summary data for all families, farm families, and nonfarm families.^{5*}

For farm families, fathers contribute about 65 percent of work time, mothers about 20 percent, and children 15 percent. Their shares of total family income approximate these percentages. Children contribute surprisingly little time to crop cultivation and to poultry and livestock raising. About one-half of their income-earning time is spent in wage-earning jobs (including working on the farms of others for wages) and about one-fifth in income-producing home production. Children contribute about one-fourth of wage-earning time and about one-third of income-producing home production time.

Mothers spend about equal amounts of time (between 3.76 and 4.47 hours per week) in taking care of poultry and livestock, wage-earning activities, and businesses and professions. They spend approximately three hours a week in income-producing home production. Fathers are clearly the most active participants in family income-earning activity. It is of interest to note that only about 40 percent of farm fathers' income-earning time is devoted to crop cultivation, although about one-sixth of their time is devoted to caring for poultry and livestock. The many sources of income for farm fathers is partly explained by the rather broad definition of farm families, and also by the variety of activities from which income is received by farmers.

*An alternative approach, the multiplication of net income from crop cultivation by an individual's time as a share of household time devoted to crop cultivation, is easily seen to be an inferior measure. First, there is no adjustment for labor quality. Second, other inputs are used besides family labor. The difficulty here may be demonstrated by an example. Suppose crop income is negative. The alternative method would yield a negative contribution for the individual even though the value of his marginal product might be positive and large.

**Average annual net income as conventionally calculated except for using gross livestock income instead of net livestock income, is P 5,881 for all households, P 6,077 for farm households, and P 5,602 for nonfarm households. P is the Philippine peso. P 7.1 = US \$1.

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Compared to the time children devote to income-earning activities, their contribution to family time used in nonincome home production and child care is seen to be much more important, accounting for approximately 30 percent of the former and 25 percent of the latter. Mothers are also important in these activities, supplying on an average about 40 hours per week to nonincome home production and 9 hours per week to the care of infants and preschool children.

The questionnaire also asked mothers to value home production for their own consumption. Although one can have little confidence in the estimates, they suggest that, on the average, parents contribute ₱617 annually to household output in these activities, children contribute ₱139, and other household members ₱25.

Comparing farm and nonfarm families, we have several interesting findings. First, nonfarm fathers spend about seven hours less per week in income-earning activities. The time they devote to nonincome home production and childcare times are similar to those of farm fathers. Mothers in nonfarm families spend about one-and-one-half more hours per week in each of the three major time categories. Children in nonfarm families contribute about 40 minutes a week less to family income-earning time, about six hours a week less to nonincome home production, and about one-and-one-half hours more to child care. The total amounts of income contributed by children in farm and nonfarm families are quite similar.

The following findings on the determinants of children's time allocation for children ages 7 and older living in the household in the week before the survey should be considered as preliminary. Other things being equal (including the age and sex composition of children), an increase in the education of parents increases the amount of time spent by children in school, with the coefficient of mothers' education being larger than the one of fathers' education. An increase in fathers' education diminishes the time children devote to income-earning activities, childcare, and home production, but increases their leisure. The effects of mothers' education are similar, except that an increase in their education increases children's work time by a small amount.

An increase in family wealth is associated with an increase in the time children devote to school, childcare, and leisure and with a decrease in the time spent working or in home production. An increase in fathers' wage rates raises the amount of time children spend in home production and leisure and reduces time devoted to other activities. An increase in the hourly wage rates of mothers has virtually no effect on children's schooling or work time, but does increase childcare time and home production time at the expense of leisure. Other things being equal, children in farm households spend substantially more time in school, home production, and leisure, and

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less time in other activities. Each additional nonfamily member in the household slightly decreases the amount of time children spend in the care of younger siblings and in income-earning activities and increases their time devoted to other activities.

EFFECTS OF CHILDREN ON PARENTS'
TIME ALLOCATION

The Model

We have summarized data which suggest that children play an important role in household production while they continue to live with their parents. Their influence on the time allocation of their parents is now examined.

One approach to exploring the variables influencing parental time allocation is to assume that each family has a utility function which has a variety of complex goods or consumables; these are produced by combinations of the time of household members, simple consumer goods, and household capital.⁴ Examples of such consumables are the education of each child in the family and the nutritional and health status of family members. Some simplification is achieved by assuming that the number of household members is fixed and then focusing on the short-run determinants of time allocation.

Thus, we will assume that the family maximizes a utility function $U = U(Z)$, where Z is a vector of consumables (Z_i) subject to a set of production functions for the Z_i . Thus, $Z_i = Z_i(L_i, K_i, X_i)$, where L_i is a vector of family time, K_i is a vector of services of household capital goods, and X_i is a vector of ordinary purchased consumer goods. The parameters of the production functions or household technology are presumably affected by the knowledge of family members. Family time, capital, and purchased inputs can also be used to produce goods which are marketed and for which the family receives income. In the simplest case, the family exports only time to the market for which it receives wage payments. The wage rate of an individual is affected by characteristics such as his experience, health, and education, and by characteristics of the market to which his labor is supplied.

It is probably not reasonable to assume, as is usual, that there exists an exogenous wage at which each person can work as many hours as he or she wishes. Rather, there are sets of jobs with time and effort requirements and income payments. In turn, the income earned from the sale of goods and time and nonlabor income (plus borrowing) may be used to purchase market

⁴See Becker (1974) and Evenson (1976) for discussions of the issues involved in constructing household utility functions.

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goods or time of nonhousehold members or for savings (a budget constraint). In the short run, it is assumed that prices of market goods and wage rates are fixed.

Finally, the production process is subject to constraints. The time each person devotes to each activity sums to the total available time of the individual.⁵ The amount of time each individual allocates to an activity must be greater than or equal to zero and services of each household capital good used in household activities must be less than or equal to available capital services.

The solution to this model is a set of equations relating the amount of time of each family member to each activity as a function of the prices of goods which may be purchased or produced in the household for sale or own consumption, wage rates, parameters of the production function, household capital goods, and the demographic composition of the household. The precise form of these equations depends upon the utility function and the production functions. Without specifying the utility function and the production processes, we have little guidance from this simple theoretical model for constructing the time allocation equations or imposing restrictions on them.⁶ Moreover, this simple model ignores uncertainty and important dynamic questions relating to investment in human and physical capital and even the composition of the household, including birth, death, and simple movement of family members and others into and out of the household.

At this early stage of research, the model outlined above has been used as a framework for describing relations among demographic and economic variables. The models estimated below are exploratory empirical models and are not formulated to test specific hypotheses about the influence of various factors on parents' time allocation.⁷

Empirical Model

For the purpose of examining the effects of children on the time allocation of parents, the time of each parent has been divided into four activities:

*Sleep is assumed to be an activity which enters the utility function of the family and which requires time and capital to produce.

**Unrealistic but convenient assumptions on household production processes include linear homogeneity and no joint production.

†As an example, it is found in the following empirical work that older female children tend to specialize in home production relative to older male children. We do not know whether this represents comparative advantages of female children in household production, lower market wages for female labor, the preferences of parents or female children for their participation in these activities, or the outcome of an investment process by which female children obtain human capital enabling them to acquire better husbands.

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Income-earning time (work), time spent in nonincome home production (home production), and leisure (defined as 168 hours per week minus the time devoted to the other three activities).

The influence of demographic and economic factors on time allocation of parents is explored with ordinary least squares multiple regression, ignoring simultaneity questions except as they are discussed in the text.⁴ The demographic factors include the ages of mothers and fathers, the age and sex composition of children living in the household in the week prior to the survey, and the number of other persons living in the household (grandparents, other relatives of the parents, servants, and other persons). Economic variables include education (which presumably affects productivity processes, and influences their preferences); whether or not the family received income from crop cultivation; the value of the household's farm animals, tools, and land (input wealth); the value of the house if owned, of the home lot, of consumer durables, and the capitalized value of nonlabor income (other wealth); and weighted averages of fathers' and mothers' hourly wage rates. The wage rates were calculated by dividing income earned from an activity by the amount of time devoted to the activity, with the weights time-allocated to each activity.⁵ For nonworking men and women, we have estimated a predicted wage using the average wage of men or women living in the same barrio with the same education.⁶ In later work, the wealth variables will be disaggregated.

Regressions were run showing the determinants of the time allocation of fathers and explaining the determinants of mothers' time allocation of fathers and explaining the determinants of mothers' time allocation. Regressions were also run with mothers' and fathers' time per preschool child as the dependent variable. The sample used in these regressions consists of intact households (that is, where the mother and father are both present).

⁴All equations have been estimated assuming linearity in parameters. An implicit assumption is that the coefficients of economic variables are not influenced by household size or composition. Stratifying by number of children and re-estimating the same equations, we found no important differences in the coefficients. These experiments are summarized later in the text. An advantage of estimating the linear model and using the same variables in each time equation is that the sum, across equations, of the coefficients of each variable equals zero. No cross-equation restrictions have been imposed.

⁵For crop cultivation, care of poultry and livestock, and fishing, the wage rate of an individual is calculated by dividing the reported replacement cost by hours worked. One of the reasons for a relatively large negative uncompensated substitution effect of the mother's wage rate on hours worked in income-earning activities is the problem of measuring the poultry and livestock wage (see above), that is, a declining wage rate for longer work duration.

⁶The predicted wages for nonworking men and women are not necessarily good approximations of the opportunity cost of their time. (See Gronau 1973.) For that reason, regressions are discussed for subsamples which include only working men and women.

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Results

The fathers' regressions include estimates for all fathers, working fathers, fathers with children, and fathers with children less than age 7. The results of the regressions for the different subsamples are similar; thus, only the regressions for all fathers are discussed here.

In general, the regression results for fathers are disappointing. That is, the R^2 and F-statistics are rather low, as are the t -statistics for economic and demographic variables. The patterns of the coefficients are, however, quite interesting. First, let us look at the economic variables. An increase in the wage rate of fathers by ₱ 1.00 per hour decreases work time by about one-and-one-half hours per week and increases leisure by about the same amount (both coefficients being significantly different statistically from zero at the .01 level), leaving childcare and home-production time unaffected. Changes in mothers' wage rates do not appear to influence fathers' time allocation. An increase in input wealth by ₱ 10,000 raises the amount of work time by about one-half hour per week and reduces leisure time by slightly less than this amount. The positive coefficient on work time is expected for two reasons. First, an increase in input wealth raises the productivity of fathers' time in income-earning activities. Second, fathers who have a greater taste for wealth will devote more time to work. An increase in other wealth slightly increases leisure and reduces childcare and home production time. Fathers in farm households work about six more hours per week, have about six hours less leisure time, one-half hour less childcare time, and about one-half hour more home production time.

The coefficient of the demographic variables is especially interesting. An increase in fathers' age by one year decreases work time by about one-third of an hour per week and increases leisure time by a similar amount. Each additional nonfamily member in the household increases work time by one-and-one-half hours per week, slightly increases childcare time, and decreases leisure by a relatively large amount. We have no a priori expectation as to the effects of others in the household. The positive effect on fathers' work time may come from the fact that others consume more than they produce, so that fathers are encouraged to work longer hours. On the other hand, it may be that men with more regular employment and higher income tend to attract relatives.

Each additional preschool child increases fathers' work time by about three hours per week, increases childcare time by about 20 minutes per week, increases home production time about 25 minutes for infants ages 0-1 and 50 minutes for children ages 1-6, and decreases leisure by about 4 hours per week. Older children—with the exception of males ages 7-9 and 13-15, and children 20 and over—seem also to increase the work time of the father.

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Older male children slightly reduce fathers' time devoted to childcare activities, and older female children appear to substitute for their fathers' childcare time by relatively larger amounts. Both older male and female children appear to substitute for fathers' time in home production. And older children, with the exceptions noted above, tend to decrease fathers' leisure.

Regressions similar to those reported above were estimated for small families (1-3 children) and large ones (4 or more children). There were no important differences in the equations. Chow tests on the different time components indicated no statistically significant differences.

Perhaps the most interesting finding of the fathers' equations is that children tend to increase fathers' participation in income-earning activities. It might be argued that the positive coefficients on older children are the result of a higher proportion of living children remaining in the home when fathers have regular employment or have higher incomes. An examination of this proportion by age group of children, however, is uncorrelated with fathers' wage rates, family income, or work time.

The effects of demographic variables on time allocation of mothers are much stronger than for fathers. We now examine the influence of economic and demographic variables on all mothers, discussing estimates for other subsamples when relevant. For all mothers, an increase in fathers' wage rates by ₱ 1.00 per hour has little impact on her work time or childcare time, but such increase reduces her home production time by about three-fourths of an hour per week and increases her leisure by one hour per week. An increase in a mother's own wage (or potential wage) by ₱ 1.00 per hour reduces her work time by about one hour per week, but it raises her childcare time about 15 minutes per week, her home production time 30 minutes per week, and her leisure time 9 minutes.

Women in farm households enjoy more than 5 hours more leisure per week, work 4 hours less, and have two-thirds of an hour less childcare time and home production time. The higher the educational attainment of women, the more time they devote to work, childcare, and leisure, with a relatively large reduction in home production time.* An increase in input wealth by ₱ 10,000 reduces work by about 50 minutes per week and increases both childcare time and home production time by about one-half hour per week, leaving leisure unaffected. An increase of other wealth by ₱ 10,000 reduces work slightly, childcare time and leisure between 25 and 30 minutes per week, and raises home production time by nearly one hour per week.

*Leibowitz (1974) finds for U.S. women that increases in mother's education increases work and childcare time and diminishes time spent in such activities as laundering.

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Turning now to demographic variables, we find that older women have less childcare time, more work time (though the increase in work time decreases as a woman ages), less time in home production over the age range of women in the sample, and less leisure time up to about age 30 with increases thereafter. Additional nonfamily members appear to substitute for the mother's time in home production; each additional person reduces her home production time by somewhat more than an hour-and-a-half per week, permitting increases both in childcare time and in leisure by slightly more than one hour per week and in work time by about 40 minutes a week.

Infants have great effects on women's time allocation. Each additional infant reduces a mother's work time by about 4 hours per week and leisure by slightly more than 6 hours per week. Childcare time increases by more than 9½ hours per week and home production time by 1½ hours per week. Other preschool children increase childcare time by 4 hours per week and increase home production time by about 2 hours per week—both at the expense of leisure, leaving work time unchanged. Males ages 7-9 increase home production time by 3 hours per week and decrease leisure by a similar amount of time. Females ages 7-9 have a smaller effect on home production time, but lead to an increase in work time of about 4 hours per week. Older male children tend to substitute for mothers' work time, and somewhat less for home production and childcare time (particularly true for the subsample of women with young children and for working women), permitting increases in leisure of two to four hours per child. Older female children, on the other hand, reduce mothers' home production time by somewhat more than 3½ hours per week, resulting in a slight increase in work time and a large increase in leisure. When the sample of all women is examined, older female children do not appear to substitute for mothers' time in childcare. The regressions for working mothers and for mothers with only young children give one the opposite impression.

Regressions for small families (1-3 children) and large families (4 or more children) were estimated. Chow tests of the various time equations reveal no significant differences in the coefficients of the economic and demographic variables taken as a whole in the two subsamples. However, it is of interest to note that the impact of a young child on a mother's childcare time appears to be quite different. In small families, an additional child raises childcare by about 10½ hours per week, and an additional older preschool child causes a rise of about 5½ hours. For large families, the increases are 6 and 4 hours per week, respectively. Mother's leisure decreases more in small families (6.1 hours per week for children ages 0-1 and 7.8 hours for children ages 1-6) than in large families (2.6 hours and 5.8 hours, respectively).

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SUMMARY

The major findings of this paper are 1) children in Laguna households contribute non-negligible amounts of income and time to their families, income-earning activities, 2) that they play important roles in nonincome home production and childcare activities, and 3) that their presence has a considerable influence on their parents' allocation of time. 4) Children of all ages appear to stimulate fathers to work longer hours at the expense of leisure. 5) Young children reduce mothers' time in income-earning activities and leisure time. 6) Older male children substitute for mothers' work time and, to a lesser extent, childcare and home production time; 7) older female children are substitutes for mothers' home production time, and their presence raises the number of hours mothers spend in income-earning activities. 8) Older children of both sexes appear to increase mothers' leisure time substantially.

These results are only preliminary and much remains to be done in specifying and estimating models to capture adequately these influences of children, and in measuring the net contribution of additional children to parents' welfare and to the welfare of other household members.

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Employment Effects on Fertility Control in Tunisia

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Abstract

Tunisian working men and women were interviewed in 1972 and subsequently re-interviewed in 1975 to determine the extent to which job satisfaction was related to fertility. A statistically significant relationship within two of three subsamples was found, which persisted even when a large number of socioeconomic background, modernity, and birth control variables were controlled. This suggests that job satisfaction exercises an independent influence over couples' fertility patterns.

One of the most significant changes accompanying modernization is the fact that having children becomes a choice rather than a necessity. This change has come about because technological advances provide effective means for limiting family size, and because of the emergence of culturally acceptable and available alternatives to having large families. Both these factors—means and ends—must exist for fertility to decrease.

In this study, the researchers have investigated the extent to which the satisfactions of employment cause men and women in the urban labor force of Tunis to want fewer children, to use birth control, and to have fewer children. In Tunisia, a woman's role is highly traditional and circumscribed, with strong pressures to remain in the home and raise a large family.

Note: ICP social scientist David N. Holmes, Jr. helped prepare this report for publication. Also assisting with the report were Dorothy Robyn and Henry Noerenberg. Correspondence may be directed to Dr. Suzman at the Department of Psychiatry, University of California at San Francisco, San Francisco, California 94143.

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Pressures to have a large family exist for the man as well. The aims of this study are 1) to determine the extent to which work satisfaction counterbalances these pressures for both sexes, and 2) to understand the mechanisms by which work satisfaction actually affects fertility, if indeed it does.

Previous research has established a negative association between employment and fertility for urban, non-cottage industry women both at the individual level (Kupinsky 1971; Mito and Rath 1965) and aggregate level (Collver and Langlois 1962, Heer and Turner 1965, Jaffe 1959 and Kasarda 1971). This has encouraged the view that female labor force participation should be promoted as a major part of national population policies (Blake 1965, Davis 1967, Kupinsky 1971, Collver and Langlois 1962). However, a great deal more investigation about this relationship is required before policy conclusions can be firmly supported. Even less is known of the relationship between fertility and male employment rewards.

Considering the case of women, the central question is why and under what conditions employment would affect fertility patterns. According to Birdsall (1976), employment affects fertility when it creates a cost/reward ratio that is more or less favorable to childbearing. The costs and rewards fall in two categories, economic and social-psychological. On the economic side, employment may increase the cost of having a child (Stycos and Weher 1967, Weller 1968). But not all female employment is incompatible with fertility. Many jobs in the developing countries, especially in the rural sector, are compatible with, and even enhanced economically by, large numbers of children. Birdsall (1976) concluded that female employment per se depresses fertility only in the modern urban labor market. Here, a further economic factor influencing fertility is the added financial gain from wives' work outside the home, particularly relative to the husband's income, with higher relative shares leading to lower fertility (Cain and Weminger 1973, De Tray 1972, and Birdsall 1976).

Psychological factors also affect the relationship between female employment and fertility. The work role may take on a greater importance than childbearing if the work satisfies motives such as status, achievement, and social utility, as well as financial reward. Satisfaction from work might, especially among the higher strata, substitute partially for the satisfaction of parenthood. In developed countries, women with a high degree of work commitment, that is, those who work for satisfaction above and beyond financial necessity, are more likely to practice birth control and have fewer children than women working for financial need (Pinelli 1971; Safilios-Rothschild 1969, 1972; United Nations 1971). Hass (1972) found that education and a favorable attitude toward non-domestic activities were more important than objective employment factors in predicting fertility for seven urban areas in Latin America.

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Another issue is the causal ordering in the relationship between employment and fertility. Do women work only until they have children or because they cannot have children at all, or does working cause them to delay or even forgo childbearing? In more general terms, the question is whether fertility level affects employment rather than vice versa. Sweet (1973) concluded that significant effects work in both directions.

With respect to work satisfaction and its relationship to fertility, we must also consider the question of causal ordering. Does job satisfaction affect number of children and/or vice versa? Evidence that the presence of young children reduces job satisfaction was found in the United States (Quinn et al. 1974). Women workers with one or more children under six years of age were significantly less satisfied with their jobs. This does not preclude the possibility that job satisfaction also acts as a cause of fertility.

Employment should also be related to fertility among men. The financial rewards of employment may act to increase fertility by allowing men to afford more children. However, the psychological satisfactions derived from male employment may depress fertility. Blau and Duncan (1967) hypothesized an inverse relationship between occupational rewards and fertility: "Whereas successful achievers have their status as adult men supported by their superior occupational roles and authority, the unsuccessful find a substitute in the authority they exercise in their role as fathers over a number of children" (p. 428).

The present study deals with a broad range of rewards in addition to the areas of status, power, and authority stressed by Blau and Duncan. These are occupational achievement, interest and challenge of the job, the degree to which it exercises one's capacities, general job satisfactions, as well as salary level and satisfaction with salary. We examined these factors in relationship to fertility for both sexes.

The relationship of employment rewards and fertility is complicated by other factors which must also be considered. For example, psychosocial modernity is a variable which may be related to both employment rewards and fertility. Recent research on individual modernity (Inkeles and Smith 1974) has shown that occupational experience can produce increments in a multidimensional syndrome of attitudes, values, and behaviors called the overall modernity syndrome. Included in this syndrome are such elements as efficacy, being able to delay gratification, planning ahead, openness to new experience, women's rights, approving of birth control, and wanting to have smaller families. (Inkeles and Smith 1974, Suzman 1974, Miller and Inkeles 1974). Individual modernity has generally shown a strong positive correlation with education and occupational status, and work satisfaction has also often been shown to have a positive relationship with occupational status. It is, therefore, possible that any relationship found to exist between

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job satisfaction and fertility might simply reflect the underlying effect of occupational status, or some aspect of individual modernity. To see how independent a factor job satisfaction is, we, therefore, control for salary, individual modernity, ideal family size, and birth control attitudes.

Specific Hypotheses

From these theoretical considerations, we formulated the following five hypotheses to be tested: Among employed men and women, lower fertility is found where job satisfaction is greater (hypothesis 1). However, job satisfaction has a stronger relationship with fertility among women than comparable men (hypothesis 2), and greater job satisfaction increases the likelihood of women remaining in the labor force (hypothesis 3). For both sexes, the relationship between high job satisfaction and low fertility will be reduced when salary is controlled (hypothesis 4); likewise, the negative correlation between job satisfaction and fertility will be weaker when ideal family size and attitudinal modernity are controlled (hypothesis 5).

METHODOLOGY

Data and Their Reliability

A series of surveys in which a sample population was interviewed and then re-interviewed permitted us to utilize the longitudinal approach to analyze the direction of effects in the relationship between job satisfaction and fertility in Tunisia. The base data are from a 1972 World Bank survey on income benefits from schooling (Simmons and Noerenberg 1974), which sampled 294 males and 129 females in the Tunis urban economy. Workers ages 20-40, with a wide range of schooling and earnings, were interviewed in a sample drawn from a total of 22 small, medium, and large firms and agencies, including heavy industry, national ministries, banks, and electrical and transportation establishments which employed a variety of skill levels. Both white and blue collar males were interviewed. Since there was no significant concentration of blue collar women employed in these establishments, only white-collar females were interviewed.

In 1974, 122 of the 294 men were re-interviewed in a study of attitudinal and behavioral modernity. In 1975 an addendum to the 1974 questionnaire, containing questions on fertility, attitudes toward childbearing, and birth control practice was administered to both women and men from the 1972 sample. In 1976, all but three of the women who had not been re-interviewed were seen.*

*In the 1975 survey, some 76 men who had not been re-interviewed in 1974 were given the 1974 re-interview questionnaire together with the fertility section addendum. Sixty-eight of the 129 women were given both the 1974 re-interview questionnaire plus the addendum, while eight

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Collection of the follow-up data at three points in time has advantages and disadvantages. Since we are dealing with what are essentially the lagged effects of job satisfaction, collection of data at different points in time allows for some analysis of the effect on the relationship of different lengths of time from baseline. Furthermore, the collection of follow-up data at different follow-up times does allow for additional comparative investigation of the relationships between 1972 job satisfaction versus current job satisfaction (as is measured in cross-sectional studies) on fertility.⁷ However, especially in the case of the white collar men, the disadvantage is that our sample is too small for us to realistically take advantage of the differential periods between baseline and follow-up.

How adequate is the sample for the research design that is proposed? What are the sample's strengths and weaknesses? Can the results be generalized to other populations? Most important for our purpose is the fact that women in the sample are in the prime of their childbearing cycle. However, the sample does not contain any non-working women, blue collar women, unskilled blue collar males, domestics, rural working women, or women employed in the sales sector of either the modern or traditional urban marketing sectors. Thus, the sample, though small (especially when limited to married women), allows for limited and cautious generalizations to a portion of the modern sector of the labor force of Tunisia.

A decade ago, only 16 percent of the Tunisian population was urbanized, with only a fair proportion of the urbanized fully integrated into the modern

women, because of their inability to take time off from work were re-interviewed on only the additional fertility-related questions. Thus, in 1974-1975, 198 of the 294 baseline men were re-interviewed with 161 receiving both the fertility-related questions at the 1974 re-interview. Of the 129 baseline women, 76 were re-interviewed, with eight of these given only the fertility questions. In 1976, with a supplementary grant from the Interdisciplinary Communications Program of the Smithsonian Institution, a highly successful attempt was made to re-interview those women who were not re-interviewed in 1975. The 1976 re-interview resulted in our obtaining information on all but three of the women who had not been re-interviewed in 1975.

Virtually all the baseline women have thus been re-interviewed, while 37 percent of the men have only been partially interviewed (that is, received only the 1974 re-interview but not the fertility questions), and 94 men have not been re-interviewed at all. When we exclude all those who had never married or were not married at the time of the re-interview, we end up with 75 white collar men, 45 blue collar men, and 94 white collar women. We find that between the 1972 baseline interview and the re-interview, some 26 men and 30 women had gotten married. Careful comparison of the 1974 and 1975 results revealed no important differences in the other descriptive statistics for those men who were partially re-interviewed, leading us to conclude that the 1974/1975/1976 samples can be considered to be well representative of the original 1972 sample.

⁷In turbulent economic times, job satisfaction (and probably to a lesser extent, work commitment) fluctuates strongly. In a study of the relationship between downturns in New York State industrial production and increased first admissions to mental hospitals over a period of 127 years, Brenner (1973) found massive correlations for most years, with the relationships peaking 6-12 months after the downturn.

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economy. Therefore, we can generalize to only a limited segment of the Tunisian labor force.^{*} At the same time, Tunisia is modernizing rapidly. In 1973, Tunisia spent more per capita on education than 36 other African countries, and more per capita on health than 38 other African countries, with the Tunisian health expenditure higher than 76 of 128 other countries. Comparisons with Tunisia's rank order on health and education indexes a decade earlier show that the country has accelerated much more rapidly in these areas than most other developing countries.

While Tunisia, like most Moslem countries, has a low rate of economically active females, the rate of increase has been considerable, with the percentage of economically active (excluding domestics) women ages 20-24—three times the percentage for all ages. Given the nature of the Tunisian economy, with its high stock of education and low stock of natural resources, future growth may lead to considerable expansion of the urban service and commercial sections, with the rate of increase of women in the urban labor force much higher than that of other Moslem countries. The Tunisian Government's efforts have been aimed in this direction, supporting equality for women (women were granted legal equality in 1957) and family planning.

The groups in our sample are likely to serve as models for the diffusion of new cultural patterns and life-styles to other sectors of the population, especially to those in the 15-19 age bracket. Thus, while the sample represents a select group in the Tunisian economy, it is one with growing significance in the determination of socioeconomic trends and is of special interest for the light it may shed on the relationship between job satisfaction and fertility.

Scale and Index Construction

The following section presents a description of the variables used in the analysis. Age^{**} and salary were collapsed into four categories to minimize the unreliability which commonly occurs in these variables.

The main fertility variables are the number of children in 1972 and the number of children in 1974/1975. We also constructed variables representing the number of children added between 1972 and 1974/1975: One for all those who were married in 1972 and another for those married at the time of re-interviews in 1974/1975. Based on the ideal number of children (from the 1974/1975 questionnaire) compared to the actual number of children in 1972 and 1974/1975, we also constructed measures of family size completion. From the birth control questions, we constructed indexes measuring knowl-

*Duza and Baldwin (1975), using other data, put the 1970 urban percentage at 43 percent.

**Age refers to a respondent's age at the time she or he was given the major re-interview questionnaire. For approximately half the blue and white collar men, this represents age in 1974; for the remaining men and for women, age represents age in 1975.

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edge of methods, frequency of use of safe methods, and belief that the government should encourage birth control programs.

Job satisfaction included: Satisfaction with present salary, satisfaction with a chance to get a better salary, satisfaction with chances for advancement, satisfaction with progress made since 1972, and general job satisfaction. Using factor analysis and item analysis, job satisfaction scales were constructed for 1972 and 1975. The 1972 job satisfaction scale is a composite of responses to seven questions on the above aspects of job satisfaction along with those on interest and commitment to the job. The 1975 index is similar except for the omission of the interest questions. Standard statistical tests of the reliability of these indexes were high (.8 for the Spearman-Brown test and .7 for the Kuder-Richardson test). Although we have called all variables measures of job satisfaction, it is clear that the 1972 measure also includes variables which directly measure work commitment and interest. Thus, our measure of job satisfaction can be considered quite similar to the measure used by Safilios-Rothschild (1972), even though her measure included some questions which tapped more directly the issue of work-role versus motherhood-role demands.

The antecedents of job satisfaction and its relationships with other variables are complex. Being married is generally associated with higher job satisfaction, at least among the men. We shall discuss other relationships for the married sample only, since it alone is used for our later fertility analyses.

In 1972, high salary was moderately correlated with job satisfaction among white collar men and women, but had a low correlation among blue collar men. By 1974/1975, perhaps reflecting the years of high inflation in Tunisia since 1972, 1975 salary has become more important in determining job satisfaction than in 1972. The full use of one's capabilities in the job has, for all three groups, a much stronger correlation with satisfaction than does salary. Unfortunately, we have no comparable measure of capabilities use in 1975, so we cannot know whether, after the period of economic stress, it declined in importance relative to salary. Among white collar men, education is negatively correlated with job satisfaction, suggesting that many educated men are underemployed and their high job aspirations unfulfilled.

There is moderate stability in job satisfaction over time. The measure in 1974/1975 is moderately correlated with the 1972 measure, especially for white collar men and women.

A question which we shall discuss and analyze further in reporting our main results is whether number of children affects job satisfaction (as well as, or instead of, the other way around). Number of children in 1972 has a moderate negative correlation with 1972 job satisfaction for the women, but there is no relationship for the men. By 1974/1975, number of children in 1972 has little correlation with 1974/1975 job satisfaction for men, while for

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the women there is a low negative correlation. Thus the evidence here is not inconsistent with number of children causing job satisfaction for women. Further evidence will be brought to bear on this issue later.

A series of scales similar to those for job satisfaction measuring aspects of attitudinal and behavioral modernity (Inkeles and Smith, 1974), were also constructed using both factor analytic and correlation methods of item selection. Most of the subscales had moderate levels of reliability. On the basis of a second order factor analysis, the modernity subscales were then combined into an overall modernity scale containing questions on belief in the rights of women and children, on the level and growth of awareness and openness to new ideas, on respondents' sense of control and rationality over their own destiny, and in dealing with others, as well as a scale which combined the remaining questions on media use, participation in civic affairs, and the growth of aspirations.

RESEARCH PLAN—TESTING THE MAJOR HYPOTHESES

After describing the sample both as to demographic and socioeconomic characteristics and birth control attitudes and use, the overall plan for analysis of the data is to analyze, first, the relationship between job satisfaction in 1972 and the number of children in 1974/1975, applying a number of relevant controls. We will take the analysis further by using children added between 1972 and the follow-up interviews as the dependent variable, introducing data from the 1976 re-interview of women, and comparing various subgroups that were re-interviewed. We shall finally examine how ideal family size completion appears to affect the relationship of job satisfaction to fertility.

For methodological reasons, partial correlation, which can be considered a modified form of multiple regression, will be used to test the hypotheses.* Zero order and partial correlations for each sample will be presented, with the independent variables partialled out serially. In this way, we can see the effect of a variety of both extraneous and explanatory variables on the basic relation between job satisfaction and fertility. By extraneous variable, we mean those peripheral variables which interfere with our clearly seeing the

*Our original research design envisaged using path analysis to estimate the effects of job characteristics on fertility. After a preliminary analysis of the data, we decided to use partial correlations (which can be considered a modified form of regression) instead. The major consideration which led to the change in our thinking was that the correlation structures of the variables differed markedly for the three groups being studied. This means that in order to get a good fit of our regression model we would have to run separate regressions for each subsample. But the sample sizes (especially for the white collar men) would not allow for all the variables to be included in the same regression since as a rough rule of thumb, there should be 10 cases per variable.

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relationship of interest; in this analysis, duration of marriage and age are two variables that we need to hold constant if we are looking at relationships with the number of children. By explanatory variables, we mean variables which might be either alternative or proxy factors in explaining (or causing) the relationship. Thus, if with duration of marriage controlled, we find a relationship between job satisfaction and fertility, we might try to hold other variables, like modernity of education, constant to see if the relationships are independent of other social attitudes, or to see if job satisfaction is just a proxy for education or salary.

DEMOGRAPHIC, SOCIAL, AND ECONOMIC CHARACTERISTICS OF SAMPLE POPULATION

This section provides a descriptive profile of our re-interview subsamples: Blue collar men and white collar men and women. While homogeneous in terms of age, the groups are more heterogeneous in their family backgrounds, educations, marriage and family patterns, occupational characteristics, and mass media and consumer behavior. A summary of these data is found in Table 1.

The age distributions of the three groups are roughly comparable, with the great majority of respondents in each group falling within the prime child-producing years. In 1974/1975, respondents ranged in age from 21 to 45 with a mean of 30 for the total sample. Mean ages for the three groups vary only slightly: 30.5 for the blue collar men, 30.1 for white collar men, and 28.9 for women. Approximately one-fifth of the respondents in all three groups are from 21 to 25 years of age.

The education and salary level of respondents' parents provides a measure of family or origin environment. The Tunisian system is complex since there were parallel French and traditional Arabic systems before independence, with the Arabic system still in evidence today as the Koutab, or religious school, to which most children go before starting their formal schooling. Measuring an individual's level of education is difficult because of the many changes and reforms of the educational system which occurred during the school years of the older men in the sample.

As one might expect, blue collar men come from families of lower socio-economic status than do white collar men and women. Among blue collar workers, 50 percent of their fathers received no formal education, approximately 25 percent went to Koutab alone, and just over 25 percent went to primary school or higher. Among white collar men, the proportion whose fathers received no schooling is less than a fourth, with over half having attended primary or above. Fathers of women respondents are the most highly educated group. The levels for fathers' income are similarly ordered,

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Table 1
Description of 1974/1975 Sample Population

	Blue Collar Men (N)	White Collar Men (N)	White Collar Women (N)	Total Sample (N)
Mean age in 1974/1975.	30.5 124	30.1 76	28.9 76	30.0 276
Father's education: Percent with no formal education.	50.0 121	23.0 73	14.0 73	32.0 267
Mean years of schooling completed by respondent.	8.7 124	12.3 76	10.2 68	10.1 268
Marital status: Percent of respondents reported unmarried.	40.0 124	38.0 76	24.0 76	35.0 276
Mean age of marriage for married persons.	26.7 70	27.1 29	22.1 57	25.1 156
Mean number of living children.	2.3 75	1.5 47	1.6 58	1.9 180
Mean number of children considered ideal.	3.0 118	2.7 71	2.7 66	2.8 255
Percent who feel that married couples should control births.	92.0 124	93.0 76	97.0 76	93.0 276
Percent of married persons who regularly control births.	66.0 68	68.0 31	88.0 48	73.0 147
Percent of married respondents who use government program regularly.	10.0 69	6.0 30	10.0 51	9.0 150
Median salary: Dinars per month.	59.0 124	81.0 75	74.0 75	71.0 274
Percent who read newspaper daily.	38.0 124	83.0 75	51.0 74	53.0 273
Arabic only language spoken at home (percent).	72.0 124	45.0 76	22.0 67	52.0 267

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(Table 1-continued)

Can speak French very well (percent).	43.0	73.0	76.0	60.0
	124	75	68	267
Percent who think a man should permit his daughter and/or wife to work so he can have more money.	37.0	41.0	66.0	45.0
	124	76	68	268
Mean duration marriage (years).	7.3	5.4	7.7	7.1
	64	26	57	147

while educational levels for respondents' mothers are considerably lower for all three groups.

Among respondents themselves, blue collar men are the least educated. Not even half received the primary school certificate, and those blue collar men who went to a post-primary school generally went to a technically oriented school (college moyen). The white collar men were the most educated. Just over a quarter received a high school certificate, compared to 11 percent for the blue collar men and 7 percent for the women.

Marriage and Family

The proportion married is greatest among the women (75 percent) and somewhat less for men (59 percent of both blue and white collar groups). Only four respondents out of 276 are divorced. Men and women differ considerably in terms of their age of marriage, reflecting the traditional practice of women marrying much younger than men. The average age of marriage for blue collar men is 26.7 as compared to 27.1 for white collar men. For women, the age of marriage averages only 22.1 years. ** White collar men

*In our preliminary analyses, a variable based upon the total number of years of schooling (including the koutab or religious schooling and time spent in both academic and technical tracks) was used. As seen in Table 1, this ranged from 0-18, with a mean for the full sample of 10.1 years completed (which corresponded to completion of the first section of the academic and secondary school). Since it correlated moderately ($r = .63$ for total sample) with a 1974/1975 variable based upon successful completion of important certificates in education, additional analysis of the differences in the education measures would be useful.

**Individuals who married between 1972 and 1975 (about 30 percent of those who were unmarried in 1972) present us with the problem of determining the limits and boundaries of the sample for the analysis. Should those who were married after 1972 be included in the analysis, even though they might have been married for only a short time? Since their level of 1972 job satisfaction is not chronologically concurrent with their 1972 marital status, would this affect the results, especially if there is a lag effect between work satisfaction and childbearing decisions? Would the relationship between job satisfaction and fertility decisions vary for newlyweds and those who have already completed their ideal family size? The decision was made to run the data both ways, first for only those who were married in 1972, and then for all those who were married at the date of the follow-up interview (including those who had been married for less than nine months because it was not possible to determine the number of years wed to an accuracy closer than a single year).

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have been married, on the average, for 2.4 years less than the women and 1.9 years less than the blue collar men. This difference in duration of marriage has obvious implications for fertility which we shall discuss further.

Table 1 also presents information on the number of living children for the three married groups. By group, the means are as follows: 2.29 for blue collar men, 1.60 for women, and 1.45 for white collar men. Among the blue collar group, only 11 percent have no children; among the sample of women, approximately 20 percent are childless. Reflecting their shorter average marriage length, nearly a third of white collar men have no children.

Respondents, unmarried as well as married, were asked what number of children they considered ideal for people like themselves. The three groups differ less on this measure than on actual number of children. For blue collar men, the mean ideal number is 2.97, for women 2.71, and for white collar men 2.70. Among white collar men and women, the modal response was two; for blue collar men, three was the mode.

Occupational Characteristics

Within the classification of blue or white collar worker, respondents are employed in a variety of occupations. Blue collar men include apprentices, journeymen, and foremen, and work as electricians, mechanics, and metal workers. The white collar men are employed in a wide range of occupations including cashiers, clerks, bookkeepers, bookkeepers' inspectors, assistant accountants, and accountants. The women are employed mainly as typists, clerks, cashiers, and secretaries.

Roughly 12 percent of the sample women stopped working for a period between 1972 and 1974/1975, with health and family reasons the most frequently stated. (Pregnancy would be included under this category.) A small number of the white collar men stopped work because no work was available, and some acknowledged disciplinary reasons.

Salary

The salary levels of blue versus white collar workers reflect their relative occupational status. For blue collar workers, median monthly salary is 59.00 Dinars. Women earn approximately 15 percent more than blue collar men with median monthly earnings of 74.25 Dinars. White collar men are the most well-paid of the groups; their median salary is 81.00 Dinars per month.

Mass Media Behavior

One of the more striking ways in which the three groups of respondents differ is in their frequency of newspaper reading. Among the white collar

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men, 83 percent read the paper almost daily, while by contrast, only 38 percent of blue collar men read the paper nearly every day. Women fall between these two groups.

BIRTH CONTROL ATTITUDES, AWARENESS, AND USE

The supplementary birth control questionnaire tapped four areas: 1) General attitudes toward birth control, 2) familiarity with various birth control techniques, 3) actual use of birth control by married respondents, and 4) awareness of and attitudes toward government efforts to encourage birth control, and use of government family planning services.

General Attitudes Toward Birth Control

Respondents were asked which of two opinions they shared: 1) A husband and wife should practice birth control so as to better care for the children they have, or 2) It is bad to practice birth control. As Table 1 shows, their response was overwhelmingly favorable toward birth control.

Respondents were also asked whether they felt their opinions about family planning were less favorable, more favorable, or unchanged, than in 1972. Not surprisingly, their responses reflect highly positive change. The proportion of respondents who felt they had become more favorable is quite high for all three groups: 68 percent of blue collar men, 70 percent of white collar men, and 72 percent of women.

Familiarity with Various Birth Control Methods

Respondents were given a list of eight birth control methods and asked to indicate those with which they were acquainted. In the sample as a whole, respondents' familiarity varies widely by technique. The pill is known to the greatest number of respondents—86 percent; the diaphragm is known to the fewest—23 percent. Awareness of the other six methods falls between those extremes.

Birth Control Use

While nearly all respondents favor the use of birth control by a married couple, the proportion of married respondents who actually practice birth control is somewhat less. Comparing the three groups, women are the most frequent users of birth control. Eighty-eight percent practice regularly, 4 percent sometimes, and 8 percent never. The proportion of men who say they use birth control regularly is considerably less. This may represent a

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lack of awareness of precautions taken by their wives. The low use of birth control among white collar men may simply reflect the fact that the men in this particular sample have been married only a short while on the average, and thus have not yet completed their ideal family size.

Government Efforts To Encourage Birth Control

Respondents were asked if they were aware of and supported the government-organized campaigns which distribute information about family planning. The results show that, across groups and for all four media, awareness is extremely high. Respondents were even more in favor of increased government spending for family planning services.

Despite their strong support of government-organized information campaigns and family planning services, respondents' use of such services is low. Blue collar men are the heaviest users, but among that group, only a tenth use the services often or very often, and less than a third use the services at all. Only 26 percent of white collar men and only 20 percent of all women respondents use the services at all. Probably a high proportion of the non-users of public services go to private physicians.

FINDINGS

Job Satisfaction and Fertility

How does job satisfaction measured in 1972 relate to number of children as of the follow-up time (1974/1975), placing the proper controls for duration of marriage and age? Furthermore, how does it relate when a range of other controls are imposed as well? Table 2 presents the zero-order and partial correlations between job satisfaction in 1972 and number of children in 1974/1975. For the blue collar men, the relationship with duration of marriage controlled is negative, and the relationship remains essentially unchanged even when family background, socioeconomic status, and modern attitude are partialled out as well. This suggests the relationship to be one which is both sturdy and independent, since it does not operate via social status, use of birth control methods, ideal family size, and modern attitudes.

For the white collar men, the reverse is true: Those with high 1972 job satisfaction have more children even when duration of marriage and the host of other variables are controlled. Since the relationship is not altered by controlling for salary, it does not seem likely that those who are most satisfied can simply afford to have more children. Unlike the blue collar men, the white collar men tend to work in the same firms as the women, but other differences between the white collar men and women—such as time of re-interview (with most having been re-interviewed in 1974 rather than 1975), smaller sample size, and shorter duration of marriage—make comparisons difficult.

Table 2
Zero Order and Partial Correlations Between Job Satisfaction, 1972,
And Number of Children in 1974-75

	Blue Collar Men	(N)	White Collar Men	(N)	Women	(N)
Zero order correlations	.05	(75)	.20	(47)	-.24*	(58)
PARTIAL CORRELATIONS, VARIABLES CONTROLLED:						
Duration of marriage	-.24*	(64)	.15	(26)	-.20	(57)
<i>Demographic Variables</i>						
Duration, age	-.24*	(64)	.15	(26)	-.24*	(57)
Duration, education	-.25*	(64)	.14	(26)	-.19	(57)
Duration, salary	-.24*	(64)	.21	(26)	-.18	(56)
Duration, father's salary	-.24	(47)	.08	(24)	-.20	(45)
Duration, education, salary	-.24*	(64)	.20	(26)	-.18	(56)
<i>Birth Control Variables</i>						
Duration, ideal number of children	-.26*	(61)	.15	(26)	-.26*	(49)
Duration, approved use of birth control	-.26*	(61)	.12	(26)	-.20*	(49)
Duration, use of safe birth control method	-.26	(36)	-.06	(17)	-.16	(37)
Duration, frequency of birth control use	-.26*	(63)	.16	(26)	-.20	(47)
Duration, combination of two above indexes	-.23	(48)	.10	(23)	-.16	(42)
Duration, change in attitude on birth control	-.24*	(64)	.13	(26)	-.19	(57)
<i>Modernity Variables</i>						
Duration, modernization index	-.24*	(64)	.15	(26)	-.22	(50)
Duration, children's rights	-.25*	(64)	.12	(25)	-.30*	(50)
Duration, women's rights	-.25*	(64)	.14	(26)	-.17	(50)
Duration, factual information	-.25*	(64)	.17	(26)	-.14	(50)
Duration, sense of efficacy	-.25*	(64)	.14	(26)	-.21	(50)
Duration, openness to new experiences	-.25*	(64)	.16	(26)	-.23	(50)
Duration, growth of ideas	-.24*	(64)	.15	(26)	-.20	(50)
Duration, sense of universalism	-.24*	(64)	.18	(26)	-.18	(50)
Duration, planning	-.27*	(63)	.13	(25)	-.20	(49)

*Significant at the .05 level.

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For the women, the relationship is negative and in most cases, close to the same magnitude. However, most of the correlations do not quite attain significance at the .05 level for the women.

Controlling age rather than duration of marriage allows the utilization of male cases interviewed in 1974 on which we do not have data for years of marriage. However, the results (not shown) do not differ appreciably from those with duration of marriage except that the correlations are closer to zero for blue collar men.

The results we have reported so far do not address two important issues in connection with testing a relationship between job satisfaction and fertility. The first is that we are really interested in looking for a cause-effect relationship, and thus it is appropriate to look at the number of children added to the family after our first measurement of job satisfaction. Second, the challenge could be raised that those who were more satisfied with their jobs felt this way because they had fewer children at the time. Thus, a control for number of children in 1972 is necessary to adjust for this possibility.

Table 3 shows the correlation between job satisfaction in 1972 and number of children added after that point, controlling duration of marriage and number of children in 1972, for the men and women re-interviewed in 1974/1975. We found that for blue collar men, white collar men, and women re-interviewed in 1975, job satisfaction at the earlier time was not correlated significantly with children added afterward. However, for blue collar men and women, the correlations are in the expected direction. Turning to Table 4, however, we see that for women re-interviewed in 1976 a significant relationship in the expected direction between earlier job satisfaction and children added was found, even controlling for the number of children they already had, years of marriage, education, salary, father's salary, and spouse's salary.

The fact that a relationship shows up in 1976 for the women, but is only hinted at in 1975, suggests that a certain minimum time lag is necessary for fertility effects to show up in a population. Further evidence for this is found for the white collar men.* Table 5 shows the correlations between 1972 job satisfaction and children added by two time points—1974 and 1975. Number of children in 1972, duration of marriage, and age are controlled. A small

*Given the finding of a stronger relationship between high job satisfaction and low fertility for the women re-interviewed in 1976 than for those re-interviewed in 1975, it seems possible that the fact that more white collar men were re-interviewed in 1974 than in 1975 might be a factor in producing the reversed relationship for the white collar group. We, therefore, looked at the major relationship separately for the white collar men re-interviewed in 1974 and 1975. The directions of the relationships differ by year of interview, though the 1975 sample size (N=9) is minute, and so we can only conjecture that year of interview might have been a factor for the white collar men.

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Table 3
Zero Order and Partial Correlations
of 1972 Job Satisfaction With
Number of Children Added*

	Blue Collar Men	(N)	White Collar Men	(N)	Women	(N)
Zero-Order Correlations						
	-.12	(63)	.22	(32)	.05	(43)
Partial Correlations						
Children 1972 and duration of marriage	-.07	(54)	.25	(17)	-.09	(42)
Children 1972, duration of marriage, and age 1972	-.07	(54)	.25	(17)	-.08	(42)
Children 1972, duration of marriage, and education 1972	-.07	(54)	.28	(17)	-.09	(42)
Children 1972, duration of marriage, and salary 1972	-.07	(54)	.31	(17)	-.10	(42)
Children 1972, duration of marriage, and father's salary	-.06	(47)	.13	(17)	-.09	(33)
Children 1972, duration of marriage, and spouse's salary 1972	--	--	--	--	-.10	(41)
Children 1972, duration of marriage, and ideal family size	-.07	(54)	.26	(17)	-.21	(37)
Children 1972, duration of marriage, and modernity	-.06	(54)	.26	(17)	-.16	(37)

*For sample married as of 1972.

relationship in the unexpected positive direction is found in 1974, but a larger relationship in the expected negative direction (based on very small N's) is found in 1975. These findings suggest a lag effect.

Another variable possibly operating on the relationship is whether the respondent has attained or surpassed his or her stated ideal family size. In

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Table 4
Zero Order and Partial Correlations of 1972 Job Satisfaction
With Number of Children Added Since 1972,
for Women Re-interviewed in 1976^a

	Zero-Order Correlations Job Satisfaction 1972	Children Added (N)
	-.37*	37
Variables Controlled	Partial Correlations Job Satisfaction 1972	Children Added (N)
Children 1972 and duration of marriage	-.33*	36
Children 1972, duration of marriage, and age	-.31*	36
Children 1972, duration of marriage, and education	-.38*	36
Children 1972, duration of marriage, and salary 1972	-.30*	36
Children 1972, duration of marriage, and father's salary	-.41*	26
Children 1972, duration of marriage, and spouse's salary 1972	-.33	21
Children 1972, duration of marriage, education 1972, and salary 1972	-.34*	36
Children 1972, duration of marriage, education, salary 1973, and spouse's salary 1972	-.34	21

^aFor sample married as of 1976.

*Significant at .05 level.

other words, whether the family has been perceived to be completed should have an effect on the relationship between job satisfaction and fertility. When we compare (Table 6) the partial correlations between 1972 job satisfaction and number of children (controlling duration of marriage) for those who in 1972 had reached or overrun their ideal family size and those who had not, we see that for the blue collar men and the women the negative relationship is much stronger among those who had completed and overrun their ideal family size. A larger sample size is needed to test this finding adequately, and a 1972 measure of ideal family size would be better; we should not underestimate the power of cognitive dissonance to raise the

Table 5
 Zero-Order and Partial Correlations of Job Satisfaction
 With Number of Children Added for White Collar Men
 Re-interviewed 1974 Versus 1975*

	<i>White Collar Men</i>			
	Reinterviewed in 1974 (N)		Reinterviewed in 1975 (N)	
	Zero-Order Correlations			
	Job Satisfaction (1972)		Children Added	
	.08	(36)	-.06	(11)
Variables Controlled	Partial Correlations for			
	Job Satisfaction (1972)		Children Added	
Children 1972 and Duration of Marriage	.12	(17)	-.29	(9)
Children 1972 and Age 1972	.14	(36)	-.32	(11)

*For sample married as of re-interview.

Table 6
 Partial Correlations Between 1972 Job Satisfaction
 And Number of Children

	Blue Collar Men	White Collar Men	Women
GROUP A			
Ideal number of children (1975) is less than or equal to actual number of children in 1972. (Assumed not to want more children)	-.26 N=15	.31 N=6	-.77* N=8
GROUP B			
Ideal number of children (1975) is greater than actual number in 1972. (Assumed to want more children)	-.01 N=37	.17 N=11	.02 N=28

*Significant at .05 level.

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ideal to the actual. However, the implication is that the effect of job satisfaction begins to operate most strongly when desired family size has been completed.

CONCLUSIONS

Our results for the women and for the blue collar men support the hypothesis that job satisfaction is inversely related to fertility. For the white collar men the results appear to be in the opposite direction to that predicted by the hypothesis (hypothesis 1). However, a number of factors suggest that we discount the white collar male results. The sample size is small, most of the subjects were re-interviewed only two years after the original interview, and of those who are married, many have been for only a short time. This makes it difficult to say whether women's fertility is more affected by job satisfaction than is that of the men (hypothesis 2), since the two white collar groups are not as comparable as would be desirable in testing the hypothesis. Our evidence goes in the direction of supporting the hypothesis, however. So few women left the labor force that it was not possible to determine whether job satisfaction was related to remaining employed (hypothesis 3). Controlling the relationship between job satisfaction and fertility for other variables, such as socioeconomic status of parents, education, salary, and spouse's income does not significantly change the negative relationship between 1972 job satisfaction and the number of children added since 1972 (hypothesis 4). The same holds true when birth control attitudes and usage are added as controls. Similarly, the relationship remains substantially unchanged when a series of scales related to individual modernity (openness to new experience, efficacy, universalism, growth of opinion, attitudes on women's rights, children's rights, and planning) are taken into account (hypothesis 5).

The findings suggest that the effect of job satisfaction on fertility is important and is probably independent of a large number of other potentially relevant variables. Job satisfaction is related most importantly to children added at a later period, even controlling for the number of children the person had earlier. Furthermore, the number of children added during a preceding time period does not appear to affect job satisfaction at a later point. All this supports a causal relationship with job satisfaction as the cause and fertility as the effect, while not negating the possibility that there is some effect in the opposite direction. Our results also suggest that job satisfaction affects fertility mainly after the ideal family size has been reached. This is related to our final main conclusion from the study: That a time lag of three or more years is necessary to measure the fertility effects of job satisfaction.

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Policy Relevance

Any discussion of policy relevance must take into account the nature of the sample and the tentative nature of our findings. We can pose some questions which seem especially relevant in light of our findings. Since changing the conditions of employment to boost job satisfaction is extremely difficult, what can be done to enhance the influence of job satisfaction on fertility levels? It appears that women who are happy in their work lower their family size aspirations. Therefore, a more liberal policy regarding pregnancy leaves and improved day care services, traditionally considered pronatalist measures, might work towards a reduction in fertility rather than against it. Such a policy might encourage mothers to keep working and to feel better about their work. By the same token, campaigns to induce more women to enter the labor force and to reduce sex discrimination in employment could pay handsome dividends. Attitudes of men toward women working perhaps require some examination and change as well. As Table 1 showed, about 60 percent of the men objected to their wives and/or daughters working.

Further Research Needs

The apparent strength of the relationship between job satisfaction and fertility derived from this small sample justifies further investigation along similar lines with larger samples including blue collar women, domestic servants, women in cottage industry, agricultural workers, and so on. Further studies, however, should be designed to sort out the potential factors underlying the relationship between job satisfaction and fertility. For example, to what extent is this relationship the result of a conflict between parental and work duties, and to what extent is it a substitution of work-oriented goals and aspirations for more traditional family-oriented goals? Given the few longitudinal studies on this topic, it would be worthwhile to build on the data base utilized in this study by re-interviewing the same sample of women to confirm and amplify the findings presented here.

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Employment and Contraceptive Practice in Selected Barrios of Caracas

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Abstract

This report focuses on the determinants of female labor force participation and contraceptive practice in four Caracas barrios. Particular emphasis is given to the relationship between these two variables in an attempt to determine whether the employment of barrio women stimulates the use of contraception. The authors found little statistical evidence to support strong links between employment and contraceptive use.

This study is based on case studies and findings of a survey which were part of a larger report on women, employment, and contraceptive practice in four Caracas barrios conducted during 1974-1975 by the Centro de Estudios Sociales, Caracas, Venezuela.^{*} The primary purpose of the study was to examine the socioeconomic implications of the incorporation of barrio women into the labor force. The study was also designed to obtain information on the problems that women face when seeking employment and in work situations.

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**Although the study is complete in itself, it also represents part of a larger ongoing program of studies on the status of women in Venezuelan society.*

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The study had four main parts:

1) A survey of barrio women. Through a random sample representing 7.7 percent of the households of four selected barrios and 620 interviews with barrio women, an attempt was made to identify and analyze factors influencing female labor force participation and contraceptive practice.

2) Case studies of 81 women in Las Minas, one of the selected barrios. These case studies were conducted to illustrate different lifestyles and their effects on employment and contraceptive practice.

3) An extended study of 100 families selected randomly from all the families interviewed in the Las Minas survey. This was conducted to monitor changes in the family from the time of the first interview, such as changes in family composition, occupational status, and income.

4) A survey of 100 factories in the Caracas metropolitan area. This survey was designed to obtain information on the problems faced by women in the labor market. Data were gathered on personnel organization and practices, recruitment and selection, training and evaluation, number and sex of employees, wages and work hours, benefits, and productivity.

One important area which the investigators sought to explore was the relationship between female employment and contraceptive practice. It was thought that the employment of women might serve, through various intermediate factors, to stimulate the use of contraception. The assumption was that employed females are more interested in preventing pregnancy because they want to continue working outside the home. It was also assumed that employed women, through daily contact with coworkers, would be in a better position to learn about the advantages and disadvantages of various contraceptive methods and the benefits of small families and pregnancy spacing. Furthermore, employed women might be better able, both financially and in terms of information, and more likely to use contraceptives than women who stay at home.

BACKGROUND

With a population of 10.7 million inhabitants at the last census in 1971 (*Censo 1974*), Venezuela is the sixth most populous Latin American nation. It is also one of the most urban, with 73 percent of the total population residing in urban areas. In 1971, Caracas, the capital city and largest metropolitan area in the country, had a population of almost 2.2 million people. Thus, approximately one out of every five Venezuelans lived in the metropolitan area of the capital.

Large-scale migration from rural areas to Caracas and other Venezuelan cities, and the subsequent invasion of private and public land for the construction of housing, began in the 1940s and reached its peak in the late '50s

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and early '60s following the fall of dictator Pérez Jiménez in 1958.¹ This internal migration is reflected in the phenomenal growth of Caracas during this period. From 1941 to 1950 the population of Caracas increased by 87 percent, and from 1950 to 1961 by 77 percent.² For the same periods the national growth rates were 31 percent and 49 percent respectively. By comparison, from 1961 to 1971, the growth rate of Caracas was a relatively low 48 percent, only slightly more than the national rate of 43 percent.

The Sample Barrios

It has been estimated that 25 to 35 percent of the population of Caracas live in low-income barrios. The barrios in this study are only four of the hundreds of Caracas barrios that were founded and developed during this intense period of internal migration. Without comparative data on the barrios of Venezuela, the barrios in this study were chosen from four different areas of the city in order to obtain a representative sample.

Three of the sample barrios in the study were selected from three of the largest economically marginal areas of Caracas: Two inner-city sectors—Petare in the east and Antimano in the southwest—and the town of Baruta, which is south of the city but still within the metropolitan area. The barrios chosen at random from these three areas were, respectively, Unión, La Carapita, and La Palomera. Las Minas, a lone barrio on the edge of a rapidly growing, middle-class residential area south of the city, was the fourth barrio in the sample. It was preselected because of the principal investigators' familiarity with it and their judgment that it was representative of a well-developed, heterogeneous barrio.

Las Minas. With a population of approximately 18,000 at the time of the survey, Las Minas is the second largest barrio in the sample. Its major growth and development occurred in the late 1950s and early 1960s. It is located south of Caracas in the hills near the urban areas of Parque Humboldt and Terrazas del Club Hípico. In recent years, there has been considerable development of middle- and high-income housing in these urban areas, but large unpopulated areas still remain to the south and east.

¹The Pérez Jiménez government did not support the construction of low-income barrios. The next government, however, initiated a public works program to establish public services and sanitation in the barrios. This program generated employment for the poor and attracted large-scale migration from rural areas to Caracas.

²These figures are for the Distrito Federal of Caracas and, therefore, do not include much of the metropolitan area. However, they are sufficient for this brief outline of growth (*Ministerio de Fomento* 1974).

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The barrio has a full range of public services including basic utilities, schools, medical clinics and community centers. However, many of these services (such as schools and medical services) are inadequate and residents must seek additional services outside the barrio. Nevertheless, Las Minas has one of the highest levels of internal economic activity and development of the sample barrios.

The barrio has a number of small retail businesses (grocery stores, bakeries, restaurants, household supplies) which serve most daily needs of the residents. Two small factories and several metal-work, carpentry, and automobile repair shops also serve the community and provide some employment to barrio inhabitants. However, most of the working population is employed outside the barrio in the towns of La Trinidad and Baruta just to the south of the barrio and throughout the metropolitan area.

Barrio Unión. The largest barrio in the sample is Barrio Unión, having 19,500 residents. It is located in the eastern part of the city called Petare. The barrio is densely populated and surrounded by other barrios. Considerable industry and many retail establishments are located nearby.

Basic utilities (water, electricity, sewers, and garbage collection) are available in the barrio as well as some basic services (schools, medical clinic, church). There are also a number of small grocery stores and other small retail businesses throughout the barrio. Those needs not met in the barrio itself are available in adjacent areas.

La Carapita. Located in the southwestern part of Caracas in the Antimano sector, La Carapita is relatively small, with an estimated population of 3,500 people. The area surrounding the barrio is similar to that of Barrio Unión. There are other barrios close by and there is much industry in Antimano, which is one of the principal industrial sectors of Caracas.

La Carapita has few public services other than basic public utilities. For most educational and health needs, residents must go outside the barrio. As in most barrios, there are small grocery stores located throughout Carapita but, in general, it has one of the lowest levels of economic development in the sample.

The major source of employment for its residents is in nearby factories. The Catholic University also employs some men from the barrio in unskilled positions.

La Palomera. This barrio is located about ten kilometers south of central Caracas in the town of Baruta. With about 2,500 inhabitants, La Palomera is the smallest barrio in the sample and, along with La Carapita, one of the least economically developed. It is also the oldest barrio, settled sometime during the 1940s.

Because of its location in the town of Baruta, its small size, and the steep slope of its terrain, there are few services available within the barrio itself.

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Most residents use the services in Baruta. Although there are some employment opportunities in La Trinidad and Baruta, most of the barrio residents work in Caracas.

Comparison of the Sample Barrio and Caracas Populations*

By age and sex, the barrio and Caracas populations are similar. The population of the sample barrios is slightly younger than the population of Caracas. Almost 43 percent of the former is under 15 years of age while only 39.7 percent of the Caracas population is similarly distributed. A slightly greater percentage of the general Caracas population (14 percent) falls in the older age groups (45-65+) than in the barrios (10.4 percent). In the middle age groups (15-44), differences between the two populations are negligible. Both populations have slightly more younger men than women, and there are fewer women over 45 in the barrios than in Caracas.

Illiteracy is much greater in the barrios than in Caracas. Approximately seven times as many males and two and a half times as many females are illiterate in the four barrios as in the general population of Caracas. In both populations proportionately more females than males are illiterate.

The percentage of males and females in the barrios with secondary and higher education is insignificant—less than 1 percent. Compared to the barrio population, one and a half times as many males and twice as many females in Caracas received some secondary education. The difference is even greater at the university level. Nine times as many Caracas males and females have had some university training as those in the sample barrios.

These educational differences are even more striking when one considers that the barrio population is younger than the Caracas population and, therefore, should have a higher participation rate in the educational system. Apparently, the age difference is offset by economic factors which preclude the full-scale participation of barrio youths at all educational levels.

In marital status, the principal difference between the two populations is the distribution of legal and common-law marriages. Although about the same proportion of persons are married in both populations, common-law unions are three times more prevalent in the barrios, and legal unions are about one and a half times more prevalent in Caracas.

The number of widows and widowers is proportionately greater in the Caracas population than in the barrios, but in both populations widows

*Data on the population of Caracas are from the government's 1970 household survey (*Encuesta de Hogares*) and are the most recent available. The four-year difference between these data and those from the barrios (collected in 1974) means that comparisons of the two populations can only serve as a general reference.

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considerably outnumber widowers. Females also outnumber males in the separated and divorced category. While the proportion of Caracas males in this category is slightly greater than that of barrio males, there are almost twice as many barrio females as Caracas females divorced or separated.

In both the barrio and Caracas populations, males are two to two and a half times more active in the labor force than are females, and Caracas males had a higher employment rate than their barrio counterparts. However, because these figures do not include the unemployed, it is probable that the economically active (though not necessarily currently employed) male population of the barrios is greater than that of Caracas as a whole.*

Women represent a greater proportion of the barrio labor force (32.2 percent) than of the labor force of the whole city (27.7 percent). This difference underscores the importance of the female's contribution to family income in the barrios.

The monthly income of workers varies considerably both within and between the two samples. In general, earnings are greater for the Caracas population than for the barrios. More than 40 percent of Caracas males and 20 percent of Caracas females earn over 1,000 bolivars (US \$234)[†] monthly, while only 25 percent of barrio males and 9 percent of females are in the same income category. In both populations, the proportion of females in this category is less than one half of the corresponding male representation.

A greater percentage of the barrio population falls in the middle-income categories (301-1,000 bs./US \$70-\$234 monthly). Seventy-one percent of employed barrio males and 79 percent of working barrio females earn between 301 and 1,000 bs. monthly, while only slightly more than 50 percent of Caracas males and females are in this category. In both populations, the proportion of females is much greater at the lower end of this middle-income category. ‡

*Unemployment status was obtained in the present study only for persons interviewed and not for other household members. Therefore, unemployment rates for the total barrio population are not available. However, data from a 1972 employment study in Las Minas shows that the unemployment rate for males was 19 percent—more than double the rate for all of Caracas (Centro de Estudios Sociales 1972).

**US \$1 = 4.28 bolivars.

†A greater proportion of the Caracas population than of the barrio population falls in the lowest income category. This would seem to contradict the general pattern established above in which the barrio population earns less than the citywide population. However, the Caracas data are inflated by two populations not represented in the barrio data. First, minors ages 10-14 are not included in the barrio data. The inclusion of this age group in the Caracas data inflates the lowest income category considerably, because most working minors earn less than 300 bolivars monthly. Second, in the barrio survey, income information was obtained only from persons residing in the house. Information on live-in maids, who stay in the houses of their employers, was not gathered in the barrio survey but was included in the Caracas sample. Because these maids are common in Caracas and are paid very low wages (in part because they receive room and board but also because many of them are minors), a large number of them fall in the lowest

The Sample Households

Great variations were observed in the composition of the 507 sample families. Almost half (49 percent) consisted of a couple or a couple with children. Another 28 percent consisted of a couple with various combinations of children, grandchildren, and other family members. Thus, a couple was present in 77 percent of the households. In the remaining 23 percent of the households, only a mother was present in 15 percent, only a father in 1.6 percent, and neither a mother nor a father was present in 6.3 percent of the households.

Of the households in the sample, 42 percent had more than six members, and 16 percent had ten or more members. The average family size for all sample households was 6.5 persons. Of all sample families, 70 percent had one to six members younger than seven years of age, with an average of 1.5 children under seven. The percentage of families with members under 10 years was 78 percent; under 18 years, 90 percent.

In most of the households, one or two family members were employed, with an average of two employed members per family. Average income of employed members of the family was 823 bs. (US \$192) a month. Nearly 15 percent of the employed earned less than 401 bs. (US \$93), while only 7.5 percent earned more than 1,500 bs. (US \$350) a month. Approximately 71 percent of the employed in the sample earned less than 901 bs. (US \$210) a month.

Sixty-two percent of the sample population had a per capita income ranging between 0-300 bs. (US \$0-\$70) per month, while 13 percent had an income of 501 bs. (US \$117) or more. The average per capita income for sample families was 365 bs. (US \$85) a month.

Average per capita income varied according to the type of household. Households which included employed brothers and other males had the highest averages (370 bs. US \$110). Where the only head of the household was male (father only), the lowest average per capita income was found (300 bs./US \$70), where the female was the household head (mother only), the average per capita income was slightly higher (347 bs. US \$81).

An inverse relationship between family size and per capita income was found. Small households (one to four members) had an average per capita income two times greater (535 bs./US \$125) than large households (10 to 25 members) which had an average per capita income of 245 bs. (US \$57) per month.

income category. Adjusting for these two inflationary factors, there is little doubt that in the lowest income category, the barrio population is proportionately more numerous than the Caracas population.

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The Sample Women

Only women over age 14 were interviewed. Half of these women had been in the barrio less than eight years; 21 percent had been living there more than fourteen years.³

METHODOLOGY

The sample households in each of the barrios were randomly selected from the numbered houses on updated maps. In Las Minas, 251 houses were selected and in each of the other barrios 110 were selected. The sample represented 7.7 percent of the housing units in the four barrios.

A total of 620 women were interviewed. In Las Minas, all women in each household over age 14 were interviewed; in the other three barrios, only one woman (over age 14 and selected at random) was interviewed.

Interviews were completed in 88 percent of the sample households. In the remaining households either the residents of the house could not be located (half the cases) or the women in the house refused to be interviewed (half the cases). Despite the personal nature of the questionnaire, there was only one refusal to continue the interview after it had begun.

Case Studies

The women interviewed for case studies were selected from those interviewed in the Las Minas survey. The main goal of the selection process was to obtain a representative sample. The Las Minas women interviewed in the original survey were classified into eight categories according to work experience, level of fertility, and use of contraception. Women for the case studies were then chosen from these categories according to the following criteria:

- 1) Proportionate representation of the category,
- 2) representation of women from as many sectors of the barrio as possible,
- 3) any individual or family characteristics thought to be of particular interest to the objectives of the study, and
- 4) as much diversity as possible among women chosen from any of the eight categories.

Women chosen in this manner formed the primary sample. Case studies were completed with 50 of the 61 women in this group. A secondary sample

³The highest stability was found in Barrio Union where over 42 percent of the women had been in the barrio 14 years or longer. Las Minas had the least stability. Only about 11 percent of the women had been there for more than 14 years and almost 55 percent had lived in the barrio less than 7 years.

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was also drawn which included 31 people from the primary sample households in which case studies had been completed. It was thought that multiple case studies in the same household would provide additional insights into family life and internal checks on the data gathered from the other person in the house.

Survey Instruments

Three instruments were prepared for the survey: A household chart, a questionnaire, and an evaluation form. In each house, basic information about each member of the household (such as age, sex, relationship to head of household, employment, education) was obtained and entered on the household chart. This was the first information obtained on a house visit, and it was used to identify the persons to be interviewed. A questionnaire of 94 items was used in which information was gathered on marriage, pregnancies, employment, contraception, inter-spouse relations, family relationships, and community involvement. At the end of the questionnaire there was an evaluation form composed of several questions for the interviewer on the quality of information obtained in that interview.

To test the three instruments and to familiarize the interviewers with them, a pilot survey of 50 interviews was carried out. Some changes were then made in the instruments, and the data obtained from the pilot survey was sacrificed.

Reliability of the Data

The only information gathered in the survey which can be identified as questionable is the incidence of induced abortion. This judgment is based on two arguments. First, induced abortion is illegal in Venezuela. There is little public discussion of it and less public approval. Therefore, it seems probable that people would deny, especially in a home interview, a personal experience of this nature. Second, medical authorities in Caracas generally maintain that there is a high level of induced abortions in the metropolitan area. These estimates are based primarily on data from the public hospitals used almost exclusively by low income people. If the estimates are accurate, some approximation of this incidence could be expected in the barrios of the city. However, in the four-barrio survey, few induced abortions were reported. There is, therefore, good reason to doubt the reliability of the survey data on abortion.

On the other hand, it should be emphasized that the data on contraception is considered reliable. Knowledge of family planning methods is widespread and used at all socioeconomic levels, and it has broad public approval including tacit approval by the local hierarchy of the Catholic Church. Inter-

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viewers in the barrio survey reported that most women spoke easily and openly about contraception.

FEMALE EMPLOYMENT

Detailed information on the current and previous employment of the women in the sample barrios and their attitudes toward work outside the home was obtained through the survey and case studies. In this section the most important aspects of the data are discussed and the results of multiple regression analysis on the determinants of female labor force participation are presented.

Of the 620 women interviewed in the four barrios, 28 percent were employed at the time of the survey and another 43 percent had worked previously but were not then employed. The remaining 29 percent had never been employed.*

The female employment rate for all of Caracas (31 percent) is slightly higher than the barrio rate (28 percent), while the unemployment rate in the barrios (3 percent) is greater than in Caracas (1.9 percent).** Although 3 percent of the women in the study characterize themselves as unemployed, the positive value many of the women place on employment and their apparent ready disposition to work when there is an opportunity suggest that this figure underestimates the female demand for employment. It seems that many women do not actively seek employment, not because of lack of interest, but rather because they believe employment is difficult to find. Home and childcare responsibilities also must be met before they can accept employment.

First Work Experience

Many barrio women leave school early and go to work, some before completing grade school and many before completing high school. School is an expense for the family and for many the income, even from a teenager's employment, is a substantial contribution to the family budget.

Over 90 percent of the women in the sample barrios who have worked outside the home started between the ages of 10 and 19, the average age of entry into the labor force being 18. Work for these young women was primarily unskilled and low-paying. Fifty-one percent had their first employment in the service sector—mostly as maids in private homes—and

*See Table 1 for additional breakdown. All tables are located at the end of this report.

**The Caracas data are from 1970, the most recent available, and therefore comparison with the 1974 barrio data should be interpreted only as a general approximation (*XX Encuesta 1970*).

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another 30 percent started as factory workers. Most of the remaining women, who probably have a higher educational level or some technical training, began in the professional services area as secretaries, nursing aides, beauticians, and teachers.

The average income received in this first employment was 274 bs. (US \$64) monthly. Despite these relatively low wage levels, only one-third of the women left their first job because they were dissatisfied with the salary or other aspects of the work. One-third left because of household and family responsibilities (marriage, pregnancy, childcare), and the rest left for various other reasons.

On the average, women remained at their first job for slightly over two years. About half left within a year of starting the work and one-quarter left after three or more years. Educational levels were not significant in accounting for differences in the length of this employment.

Last Work Experience

The job categories occupied by women in their last employment are similar to that of their first employment. Only slightly more women worked in the service sector (53 percent compared to 51 percent); slightly fewer worked in factories (26 percent compared to 29 percent) and professional services (10.6 percent compared to 11.6 percent).

Salaries in the last employment were generally higher than those of the first employment. Twice as many women earned more than 501 bs. (US \$117) monthly and the average monthly salary was 387 bs. (US \$90), an increase of 40 percent over the average first employment salary. Considering the minor changes in the occupational distribution of women from the first employment, the major factor in the salary increase is probably the general increase in all economic areas.

The reasons given for leaving the last employment are related to salary and other aspects of the job in about 20 percent of the cases. Almost one-half of the women left because of family responsibilities, a sharp increase from the first employment.

There are only minor differences in the duration of employment between the first and last jobs. Women stayed an average of two years in their last

*Even though many of these women were born in rural areas, only a few were first employed in the agricultural sector. There may be two reasons for this. First, women do not participate in agricultural activities as salaried workers. Although many of them work, their work is not paid and, therefore, not considered employment. Second, the majority of these women may have migrated to Caracas when they were very young and so had their first job in Caracas or a neighboring city.

**Well over half of the women were earning less than 350 bs. (US \$82) monthly and almost 90 percent were earning less than 501 bs. (US \$117) monthly.

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employment . . . compared to 27 months in the first. As with first employment, education was an insignificant factor in length of employment.

Current Employment

The occupational distribution of currently employed barrio women differs considerably from that of previous employments. There has been a sharp decrease in the proportion of women working in the service sector, primarily as domestic maids, from over 50 percent previously to 36 percent among those currently employed. This decline is particularly important because the salary of maids is among the lowest of any employment.

At the same time, there was a proportional increase of barrio women in the areas of professional services and sales personnel. Approximately twice as many women are currently working in these areas (30 percent) as there were previously (17 percent). Apparently, changes in the labor market and increased educational and technical training have resulted in more job opportunities for barrio women outside the traditional domestic service area.

Changes in the occupational distribution of barrio women have been accompanied by substantial income increases. At the time of the survey, employed barrio women were earning an average of 82 percent more than in their first employment (572 bs./US \$134 monthly compared to 314 bs./US \$73). Half as many women currently earn less than 501 bs. monthly (US \$117) and six times as many have a monthly income greater than 800 bs.(US \$187).*

Salary varies significantly among currently employed women according to the type of employer (government, private, self-employed) and the worker's level of education. Women who work for the government at national, state, and local levels (15 percent of the total) have both the highest average salary (1024 bs./US \$239) and education (6.3 years) of all working women. Those working for private companies (52 percent) have the next highest average income (691 bs./US \$161) and almost the same educational level as the government workers (6.2 years). Women in the remaining categories, domestic maids and self-employed, have the lowest average salaries (440 and 516 bs./US \$102 and \$120) and the least education (4.2 and 4.9 years respectively). Thus, although education is positively related to salary, the type of employer is an important intervening factor, particularly in the case of government and private sector workers.

A comparison of the distribution of female income levels between the barrios and Caracas shows proportionally more barrio women in the lower

*Obviously, changes in the value of the bolivar must be taken into account to assess these income increases precisely.

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income groups and less in the higher income groups. The difference is particularly great at the highest income level (1001 bs./US \$234 or more monthly) where the proportion of Caracas women is four times greater than barrio women. At the lowest income level, the proportion of Caracas women is moderately larger than that of barrio women.*

Summary

The majority of barrio women in the sample have been employed at some time in their lives. Most had their first job when they were young and single. Due to minimal levels of education and technical training, these women have worked predominantly in unskilled, low-paying jobs, many as domestic maids. Current employment data show that this pattern is changing, but barrio women still earn considerably less than women in the Caracas metropolitan area.

The unemployment rate for women in the barrios is at least 50 percent greater than in Caracas. And presumably, an even greater number of barrio women would seek employment if more job opportunities and alternative ways of fulfilling domestic responsibilities were available.

FACTORS INFLUENCING EMPLOYMENT

Results of the Multiple Regression Analysis

Multiple regression analysis was used to measure both the combined and individual importance of a series of independent variables in the explanation of female participation in the labor force. This analysis was applied to two populations—all the women interviewed and all the ever-married women interviewed.

All women interviewed. The combined influence of nine independent variables accounted for just over 20 percent of the variance in labor force participation among all women in the barrio sample. The first seven variables added significantly to the explanation, while the last two variables contributed only 0.1 percent and are not significant.

The first two variables, accounting for almost 14 percent of the variation, are both attitudes toward work. The first is "Would you like to work?" or, if employed, "Do you like working?" The second is "Would you consider employment outside the home beneficial for the woman?"

*This difference is probably due to the inclusion of 10-14 year olds and live-in maids in the Caracas sample. Both of these groups earn very low salaries and are not included in the barrio sample.

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The first variable, which accounts for almost half of the total explanation, was negatively correlated with participation in the labor force. In other words, more of those who were not working than who were had a favorable attitude toward employment. Apparently, many women would like to be employed but are not. The second variable accounted for 4 percent of the explanation and was positively related to labor force participation. Women who thought employment outside the home is beneficial were working in greater proportion than those who did not consider it beneficial.

The variable, number of employed persons in the household, has a negative correlation with female employment and contributes 1.5 percent to the explanation of the variance. Women from households where there are few employed persons are more apt to work than those in households where many persons are employed. Women without husbands (single, divorced, separated or widowed) are also more likely to be working than married women.* The marital status variable adds just over 1 percent to the explanation of the variance. The lower the average educational level of the household (members over age 14), the greater the probability the woman interviewed was working. This variable contributed about 1 percent to the explanation of the variation in female labor force participation. The variable, education of the woman interviewed, had a positive relation with participation in the labor force—that is, women with more education tended to work in greater proportion than those with less education.

There was also a greater tendency for older women to be working than for younger women. The age variable contributed almost 1 percent to the explanation of the variation.

The remaining two variables, number of children under age seven and the average per capita income of the household, contributed little to the explanation of variation in the labor force participation.

The seven significant variables in this regression equation accounted for only 20 percent of the variation in labor force participation among all barrio women interviewed. The two most important variables involved attitudes toward work. They accounted for almost half of the total explanation. Age, education, and marital status of the women interviewed together contributed just over three percent to the regression, and the two household characteristics—average education and number of employed persons—add almost 3 percent. Surprisingly, the last two variables—a measure of the general economic condition of the family and the number of children under age seven—contributed virtually nothing to the explanation.

*See Table 2.

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All ever-married women interviewed. The eleven variables in this multiple regression account for nearly 17 percent of the variation in labor force participation among all ever-married women interviewed. The first seven variables account for most of the explanation; the final four variables together contribute less than 1 percent.

The single most important variable is the current marital status of the woman. As in the previous regression, women without husbands (divorced, separated, and widowed) work in greater proportion than married women. This variable explains almost 7 percent of the variation in the labor force participation.

The next most important variable is the number of workers in the household. This factor has a positive relation with labor force participation and contributes almost 4 percent to the regression. That this variable had a negative relation in the previous regression probably only reflects the greater labor force participation among ever-married women (particularly those without husbands) than among single women.

The larger the household size, the less probable the woman is working. This variable contributes just over 3 percent to the regression. The variable number of years married adds 0.7 percent to the explanation of the variation. The longer a woman has been married, the less likely she is to be working.

As in the previous regression, there is a tendency for older women to participate more in the labor force. The apparent contradiction between this variable and the previous variable (years married) is probably due to the greater participation in the labor force by separated and divorced women than by married women.

Women who use contraceptives tend to participate more in the labor force than those who do not. This variable contributes 0.6 percent to the explanation of the variation. Women who have a favorable attitude toward leaving their children in the care of others (family, friends, or daycare centers) while they work are more likely to be working than those who do not favor such arrangements. The variable attitudes toward childcare arrangements contributes 0.7 percent to the regression.

The four remaining variables (subfecundity problems, total number of children, attitudes toward work, and average per capita income) add only 0.4 percent to the regression. Although attitudes toward work ('Is work outside the home beneficial for women?') contribute substantially to the explanation of labor force participation among all women interviewed (in the previous regression), this variable is an insignificant factor for the population of ever-married women. In both populations, average per capita income has no explanatory importance.

For the population of ever-married women, seven variables account for about 16 percent of the variance in labor force participation. Current marital

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status, age, and years married together contribute about 8 percent, and the two household variables (household size and number of workers) add another 7 percent to the regression. Use of contraception and attitudes toward childcare add a final 1 percent to the explanation.

The Most Important Variables

Marital status and household economic conditions. The traditional notion that a woman's place is in the home is supported in the barrios. Even so, many barrio women have favorable attitudes toward employment outside the home, and these attitudes are positively related to participation in the labor force. However, it seems clear from both the survey and case study data that the marital status of women and the economic condition of their household are important intervening variables between these attitudes and actual labor force participation.

For women without husbands (single, separated, or divorced), employment status is largely determined by their own attitudes toward employment and the economic needs of their households. Eighty-six percent of such women favor employment and more than half of them are working. Single women work to earn personal spending money and for the adventure of it. When there is economic need in their families, they also work to contribute to the family income. For divorced and separated women, work status is primarily determined by economic needs. Often, they have to work to maintain themselves and their children. Those fortunate enough to live with parents or other relatives have less economic need and can sometimes choose whether or not to work.

The case of the married woman is different. Although over 70 percent of the married women in the study favor employment, less than one-quarter are working. Few husbands (less than 25 percent) approve of their wives working and women do not tend to work against their husbands' wishes. Thus, a married woman's attitudes toward employment are less important than her husband's approval of her employment.

Attitudes toward work are more likely to be an important factor in the employment status of women without husbands. Married women must contend with their husbands' traditional ideas about sex roles.

Household size and number of workers. The regression analyses indicated that the total number of people and the number of workers in the household account for some variation in female labor force participation. In general, women serve as a secondary labor force within the household. When male workers cannot earn enough to meet household needs, women enter the labor force to supplement male income. The order in which they enter the labor force depends on their marital status. Single women, without the re-

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sponsibilities of children or husbands, are most likely to seek employment, followed by divorced and separated women. Married women are likely to be the last to seek employment, and then only if the economic condition of their household is precarious.

Education and self-esteem. Data from the barrio survey indicate that the educational level of the interviewed women is related to their employment status. The higher the woman's level of education, the more likely she is to work. Educational differences, while significant, are of little importance in the regression. Education adds only about 1 percent to the explanation of the variance in the employment status of women. Considering the relatively low and narrow range of educational achievement among the barrio women (over 80 percent have six years or less of education and none have ever attended college) and the economic need of many of their families, it is not surprising that this variable has so little importance.

The low self-esteem many women in the case studies expressed is an important negative factor associated with the minimal level of educational achievement. Women feel they are grossly untrained and unprepared for any type of employment. Many said they do "... not know how to do anything except to bear and raise children," and therefore they can not even think about seeking employment. Despite this lack of education and their strong feelings of inadequacy, some of these women do work (primarily as domestic maids), but only in cases of extreme economic need in the household.

Employment of married women and interspouse relations. Only 25 percent of the married women in the sample are working. One of the factors influencing their employment is the type of interspouse relations they have. The case studies, especially, show the importance of these relations.

A married woman is more likely to be working in a household where the husband approves of her working and where he shares some of the household responsibilities. Moreover, using a more general index of interspouse relations,^{*} the study found that women who experience joint relations with their husbands are more likely to be working than those who have segregated relations. Husbands who share many aspects of their lives with their spouses seem to be less constrained by traditional sex roles and more willing to allow their wives to work. It should also be noted that women in these joint relations are young, almost all have at least completed grade school, and they have few children.

^{*}Interspouse relations were defined as segregated and joint according to a series of measures which gauged the degree of sharing between spouses of household tasks and responsibilities, recreational activities, friendships, and daily communication. Those couples who share more were labeled joint and those who share less, segregated.

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Childcare arrangements. Barrio women who want to work face a major problem in finding alternate childcare arrangements. Many women said they are unable to work because they cannot make suitable arrangements.

The barrio survey found that most women would prefer to leave their children with relatives or in a daycare center while they work, but few have a choice. Only a minority of women have relatives either in the household or nearby in the barrio who are both willing and able to care for someone else's children. Usually these relatives have sufficient work and responsibilities taking care of their own children. Daycare centers are virtually nonexistent and if one is available, it is probably full or too expensive.

Problems of finding employment. Finding employment is a major problem for barrio women both because of the relatively limited demand for their services and the limited sources of information about job opportunities. Many barrio women have little education, occupational experience or specific training and therefore are part of a large segment of the labor force competing for a few unskilled jobs. More than half of the working women in the sample, for instance, are employed as unskilled factory and service workers.

Information about job opportunities, particularly for unskilled work, is limited. ** Classified ads in the newspapers come closest to being a central source of current information on jobs available throughout the city. However, these ads do not list many unskilled jobs, and those they do list draw so many candidates that it is seldom worthwhile responding. Women are left to rely upon less formal ways of obtaining job information. More than three-quarters of the barrio women currently working learned of their jobs through a friend or relative or by visiting potential employment sites. Although these informal methods of seeking employment are obviously successful for some women, they appear to sharply restrict employment possibilities.

CONTRACEPTIVE PRACTICE AND ITS INFLUENCING FACTORS

Both the survey questionnaire and the case studies investigated factors related to the use of contraceptives by barrio women. The major findings and implications are discussed in this section.

Marriage History

The average age at marriage† for the sample women is 19 years: 52 percent

*Even companies that are required by law to provide childcare facilities seldom do so. Only one of the 90 companies surveyed provides such services.

**The barrio Las Minas has a job placement center, but it is the only one in the sample and one of the few in all the barrios of Caracas.

†The married category includes legally married women and women in common-law unions.

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marry between the ages of 12 and 18; 17 percent between the ages of 12 and 15; and only 12 percent after the age of 23.

At the time of the study, 17 percent of the women in the sample were single.⁸ Almost 69 percent of the women had husbands present, and 14 percent had been married or in a common-law union at some point in their lives but were currently widowed, divorced, or separated.

About 41 percent of the sample women had their first child before age 18; only 13 percent had their first child after age 25. The average number of pregnancies per woman is 4.89; 22 percent have had more than eight pregnancies; 7 percent have had from 11 to 18 pregnancies, and 30 percent have had only one or two pregnancies. Twenty percent of all the women interviewed have never been pregnant. This includes single women, sterile females, and females who for other reasons have not had any children.

The interval between pregnancies is four to twelve months for 13 percent of the women; less than two years for 56 percent, and more than four years for only 7 percent of the women. The average number of live births is 4.19 for each mother. Comparing this figure with the average number of pregnancies (4.89) results in an average of 0.70 dead or unborn children for each interviewed mother. Sixty-two percent of the mothers interviewed have one to four children, and almost 9 percent have nine to fifteen children. Twenty percent of the women in the sample reported at least one abortion. About 19 percent reported from one to five spontaneous abortions, while less than 1 percent reported one or two induced abortions.⁹

Results of the Regression Analysis

Multiple regression analysis was used to measure both the combined and individual importance of a series of independent variables in the explanation of contraceptive usage. To identify differences in the importance of these variables between all married women and only those married women who are currently working, the regression analysis was applied to two populations—all married women ages 15-54 and all working married women in the same age range. A summary of the regression analysis results from these two populations is presented below.

All married women ages 15-54. Taken together, the ten independent variables included in this regression account for about 13 percent of the variation in contraceptive usage. The first six variables contribute the most to the explanation, while the last four add less than 1 percent to the regression.

⁸This category includes women not legally married or united in common law marriage.

⁹It should be noted that the sample population was relatively young and had not gone beyond their reproductive age.

⁺For reasons mentioned earlier, the data on induced abortions are not considered reliable.

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The educational level of the married women is the most important variable in the regression. It explains 4.5 percent of the variation and is positively associated with contraceptive use. A woman's favorable attitude toward contraception is also positively related to her current use of some birth-control method. This variable contributes almost 2 percent to the explanation of contraceptive usage.

Both the husband's and wife's desires for more children than they currently have are significant factors in explaining contraceptive use. The husband's desires contribute slightly less than 2 percent to the regression and the wife's desires just over 2 percent. Interestingly, the direction of the association is different for each. The use of contraception is related to the husband's desire to stop having children and to the wife's desire to have more children.

Average per capita household income has a positive relation with contraceptive use and contributes almost 2 percent to the explanation of the variance. The number of years a woman has been married is negatively related with her use of birth control and contributes almost 1 percent to the regression.

The remaining four variables (employment status, type of interspouse relations, subfecundity problems, and total number of children) combined, add only 0.6 percent to the explanation of the variance in contraceptive usage and can be discarded.

Married women ages 15-54 who are currently working. The ten variables in this regression analysis explain about 25 percent of the variance in contraceptive usage. The first eight variables, accounting for most of the explanation, are: Education, total number of children, years married, subfecundity problems, income, interspouse relations, and male and female desires for more children.

In this regression, as in the previous one, education is the most important variable. It has a positive association with contraceptive use and explains about 9.5 percent of the variance.

The total number of children is positively related to contraceptive usage and contributes 2.5 percent to the regression. Years married contributes another 2.5 percent to the explanation, but this variable has a negative association with contraceptive use.

The variable subfecundity problems explains almost 4 percent of the variation in contraceptive usage. Interestingly, the association is negative. Women who have problems getting pregnant or have had repeated miscarriages use contraceptives more than women who do not have such problems.

The income a woman receives from her employment has a positive relation with contraceptive usage, contributing almost 3 percent to the regression.

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Interspouse relations were classified according to the degree of sharing between husband and wife of household responsibilities, recreational activities, friendships, decision making, and daily conversation. Those who share more were said to have joint relations and those who share less had segregated relations. This variable explains about 1 percent of the variance in contraceptive use and the association is positive. More of those couples that have joint relations than those with segregated relations use contraceptives.

Combined male and female desires for more children contribute about 3 percent to the explanation of contraceptive usage (1.3 percent for the males and 1.8 percent for the females). For both males and females, contraceptive use is greater among those couples who do not want more children than among those who do.

The last two variables, attitudes toward contraception and average per capita household income, are positively associated with contraceptive use but have little explanatory power in regression.

Comparison of the Regressions

Comparing the results of the multiple regression analyses in the two populations—all married women and married women who work—shows there are sharp differences in both the combined and individual importance of the independent variables. The ten variables in the analyses account for twice as much of the variation in contraceptive use among the working women (over 25 percent) as among all women (over 13 percent).^{*}

Five of the nine variables shared by both regressions are more important for the working women and four are more important for all women. Those variables of more importance for working women are: Education, subfecundity problems, total number of children, years married, and type of interspouse relations. In the case of two variables—subfecundity problems and total number of children—the direction of the association is different in the two populations. Among working women, those who have subfecundity problems are more likely to be using contraceptives than those who do not have such problems, and those with more children are more likely to be users than those with fewer children. These two variables have a negative association in the population of all married women and virtually no explanatory power in that regression.

The variables less important for working women than for all married women are: Attitudes toward contraception, both male and female desires

^{*}Only nine of the ten variables are the same in both regressions. The regression for all married women includes the variable employment status; the regression for married working women includes the variable woman's income.

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for more children, and average per capita household income. In only one of these variables (women's desires for more children) is the direction of the association different in the two populations: Working women's desires to have no more children are positively associated with their use of contraception, while among all married women these desires are negatively associated with contraceptive use.

The Most Important Variables

The preceding parts of this section contain information on the statistical importance of a series of independent variables in the explanation of contraceptive use. This part supplements that information with findings drawn from the case studies and discusses in more qualitative terms the causal links between individual factors and contraceptive behavior. The material is organized under several categories considered intermediate variables through which any factor must operate to influence contraceptive behavior.

Knowledge of and attitudes toward contraception. In general, the study found that familiarity with the existence of birth-control methods is almost universal among barrio women. Although about half of the women did not recognize the term family planning, they did know methods to avoid pregnancy.⁴ Knowledge of specific birth-control methods is also fairly widespread, and most women are familiar with several methods. The five most well known (the pill, IUD, condom, vaginal douche, and female sterilization) were recognized by half or more of the women.⁵

Another aspect of contraceptive knowledge shared by a large minority of women concerns the harmful effects of specific methods. These beliefs range from moderate to wildly exaggerated. For example, one of the most common beliefs about the pill is that ". . . it sucks the life out of the women," an exaggerated reference to the fact that some women lose weight when taking the pill. Similarly, women's opinions about the IUD (intra-uterine device) range from its harmful effects on the health of the woman to the damage it does to the fetus (the belief that it becomes lodged in some part of the fetus's body). Although these beliefs are not widespread among barrio women, they seem sufficiently strong among a minority of women to persuade them not to use these or other birth-control methods.

Three of the most important factors related to women's knowledge of contraception are their age, education, and work experience. Older women

*Women who did not recognize the term family planning were asked if they knew of ways to avoid pregnancy.

**These figures include those women who were able to name each of the methods as well as those who recognized the methods only after the interviewer named them.

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and those with little education or work experience are most likely to be among those who are not aware of contraception and who hold beliefs about its exaggerated effects. These women tend to live in a narrow social world which restricts their contact with sources of information about contraception. Some cannot read and others seldom even leave their homes.

Barrio women's attitudes toward contraception are generally positive. Over 80 percent have favorable opinions. Sixty-nine percent of these women said they favor contraception because it is important to have the number of children a couple can support. Other women mentioned the importance of family planning to prevent health problems of the mother resulting from too many pregnancies. While education influences these attitudes somewhat, 70 percent of those with less than six years of schooling favor contraceptive use.

The employment status of women is also of some importance. Over 90 percent of the married women who are working have favorable attitudes toward contraception. Working women have a slightly higher educational level than those who are not, and they are probably influenced by their coworkers' contraceptive knowledge and experiences.

Fifty-seven percent of the women who have unfavorable attitudes toward birth control believe these methods are harmful to their health. As noted above, exaggerated ideas about the side effects of some methods (particularly the pill and the IUD) are common and undoubtedly an important factor in these health-related objections.

Relatively few objections to birth control (17 percent) are based on religious beliefs, especially considering that the majority of women are Catholics. Apparently, for most women, their religion's prohibition of birth control (other than rhythm) is not an important factor in their own attitudes toward contraception.

Age and education. Age and education are the two most important basic variables distinguishing contraceptive users from nonusers. Married women ages 20-44 are most likely to be users (50 percent), followed by younger women ages 15-19 (24 percent), and older women ages 45-54 (14 percent). Younger women, although informed about birth control and favorably disposed to it, are usually anxious to have several children (preferably a boy and a girl) early in their married life and are not interested in using contraceptives at that time. Older women, on the other hand, the vast majority of whom claim that they want no more children, are probably most influenced in their contraceptive behavior by their limited knowledge of birth

*The attitudes toward contraception and family planning are considered together.

**In general, these women are referring to the pill and IUD.

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control. These women are particularly prone to view contraception skeptically and to believe stories which exaggerate the harmful side effects of particular methods.

Contraceptive users and nonusers also differ in level of education. Three times as many women using some form of contraception have more than four years of schooling as women who do not use contraception. Better educated women—those with more than four or five years of schooling—have more knowledge of birth-control methods and are more favorably disposed to use them than women with less education. Although formal education in Venezuela does not include sex education where, presumably, contraceptive methods might be explained, better educated women are more capable of learning about birth control themselves and realizing their desires to space or limit the number of children they have.

Interspouse relations. One hypothesis proposed by the study was that interspouse relations would be an important factor in a couple's use of contraception. It was thought that couples who share more household responsibilities, recreational activities, interests, and friends (labeled joint relations) would be more likely to discuss and resolve family problems together (including their desires for more children) and therefore would be more likely to use contraceptives than those couples who share these responsibilities to a lesser extent (segregated relations).

Data from the survey did support the association between the type of interspouse relations and conversation about desires for more children. Couples with joint relations are more likely than those with segregated relations to discuss their desires for additional children. Furthermore, it was found that couples who have had such discussions are more likely to be using contraceptives than those who have not discussed their desires for additional children. But a strong link between the type of interspouse relations and contraceptive use is not supported by the data. Although there is a tendency for women who have joint relations with their husbands to make greater use of birth control than those who have segregated relations, the difference is not significant.

Prior to the study it was thought that unilateral decisions to use contraception would be rare, but investigators found that in slightly less than half the cases, the wife (35 percent) or the husband (9 percent) makes such a decision. Thus, while interspouse relations and husband-wife communications may be of some importance for a joint decision to use contraception, they are not necessary for a unilateral one. On the contrary, it is probable that unilateral decisions about contraception are more frequent among those couples who maintain relatively low levels of interspouse communication.

Desire for more children and economic condition of household. There are

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many reasons for current contraceptive use.* A simple model of contraceptive behavior might reasonably propose that a couple's desire to have more children and the family's economic condition are basic factors in the decision to use some form of contraception. In this model, the family's economic condition would be a key consideration in a couple's desire for more children and, presumably, the couple would adopt a contraceptive method when they no longer want additional children.

The barrio study found that the desire for more children is associated with the economic condition of the family. More couples from higher per capita income households want to have additional children than couples from lower income households. Also, the desire for more children varies indirectly with the number of children a couple already has. For example, while slightly less than half of the couples with one to three children want additional children, less than 5 percent of those couples with more than three children want additional ones.

However, although a couple's economic condition is closely associated with their desires for more children, their use of contraception is not. Less than 50 percent of the couples in the study who want no more children are currently using a birth control method. A greater proportion of couples with higher per capita income (50 percent) are contraceptive users than those with lower income (42 percent), and a greater proportion of couples with fewer children (44 percent) than those with more children (38 percent) are currently using contraceptives. In other words, there is a sharp discrepancy between desires to have no more children and contraceptive use, particularly among low per capita income couples and among those with more than four children. Many of the women in these cases are older and less educated, and have objections to contraceptives. They can best be described as traditional, homebound women who have had little experience outside the home (such as employment), and they have little initiative to try new things (such as birth control).

CONCLUSIONS AND POLICY RECOMMENDATIONS

Employment and Contraception

A major purpose of the four-barrio study was to explore the relationship between female employment and contraceptive practices. The investigators assumed that, in some way, the employment of women might stimulate

*See Table 3.

**See Table 4.

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contraceptive use. In fact, data from the case studies do suggest that employment is likely to increase women's use of contraception for several reasons. First, communication with coworkers serves to increase women's knowledge of birth-control methods and to influence them favorably toward the use of contraception. More generally, work tends to develop women's self-esteem and thereby strengthen the belief that they can control their own lives. Although the extent of these influences varies according to the type of employment (for example, a domestic maid has no coworkers), for the most part, working women are better prepared and more willing to use contraception than those women who are not working.

The survey data, however, provide little statistical evidence to support strong links between employment and contraceptive use. As a group, working women use contraceptive methods slightly more (46 percent) than nonworking women (41 percent), but the difference is minor and not significant. Nor is there a significant difference between working and nonworking women when age, education, attitudes toward birth control, and desires (both male and female) for children are controlled for individually. Only in the case of two variables are significant associations found. Among married women who did not have any children, a significantly greater proportion of working women are birth-control users than nonworking women. The difference between working and nonworking women is also great for those who have more than eight children (75 percent of working women and 28 percent of nonworking women are contraceptive users).

Another significant difference is found in the area of interspouse relations. Among couples with interspouse relations that are intermediate between joint and segregated, a significantly greater proportion of working than nonworking women are using contraceptives. Working women with joint relations are also using contraceptives more than nonworking women in the same category, but the difference is not significant.

These findings suggest that, contrary to the original hypothesis, employment is not a particularly important factor in women's use of birth control. Although work may enable some women to learn more about contraception, persuade them of its advantages, and stimulate them to use contraception, these stimuli are apparently no more important than those which nonworking women receive in their daily lives. The study also found that few women use contraception just to continue working. In and of itself, work is not a desirable goal for most barrio women. They work hard for short and intermittent periods during their lives primarily because of economic need, and they work without incentives of promotion. Work is not a career for these women; therefore, few attempt to prevent pregnancy to continue working.

Family Planning

There is a great unmet demand for family planning services in the barrios. Of the 620 women interviewed, 371 said they wanted more information on family planning. When these women were asked whether they knew someone who could give them this information, 295 said that they did not; only 74 said they knew someone (a member of the family or a friend) who could give this information.

To meet this need for more information, family planning services should be expanded to make them more convenient and available to barrio women. More family planning centers should be located in or near the barrios. Many women now have to travel a considerable distance within the city to locate a family planning center. For some women, the cost and inconvenience of this trip discourages them from making the effort.

Family planning services would also be more readily used if they were located in clinics which administer child and maternal health care as well. Such facilities should also offer treatment and counseling to women who have subfecundity problems. All of these services are interrelated and should be treated as such in the clinics. Clinic services might also be expanded to include home visits by trained outreach workers who would follow up on clinic cases and identify new ones. Home visits of this type would also serve to link the clinic more closely with the community and its needs. To expand the services of the clinic and to keep operating costs at a minimum, paraprofessional personnel could be used. These might include nurses aides and community social workers. These people should be adequately trained and, if possible, recruited from the community.

The attitudes of barrio women revealed in the study suggest that certain approaches to providing family planning services would be particularly effective. First, the health benefits of family planning for both mother and child should be emphasized. Since maternal and child health problems are common in the barrios, women are already motivated to alleviate these problems. Information that emphasizes the health benefits (of spacing children, for example) to both mother and child would probably be attractive to barrio women. In this context, contraceptive use assumes a greater importance for barrio women because it is related to their existing desires.

Second, a variety of birth control methods should be offered. Many barrio women are familiar with relatively few methods and would be better able to meet their particular needs (economic, sexual, and health) if they had a wider selection from which to choose.

Third, information about the use and advantages of particular methods should be accompanied by information about the possible side effects. Com-

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plete information is equally important in printed literature and in the oral communication between physicians and patients. Unexpected side effects fuel rumors about the harmful aspects of birth control methods and cause women to discontinue using them.

Multipurpose Centers

One approach to meeting both the family planning and employment needs of barrio women is to establish community centers in the barrio. These centers would include daycare facilities, a lowcost community laundry, a cafeteria where working women could buy already prepared foods to take home, complete medical facilities (particularly maternal and child health care, and family planning services), and complete vocational guidance and job placement services. Such multipurpose centers would provide essential services for barrio women and for the whole community.

Table 1
Employment Status of Women When Interviewed

	Persons	
	Number	%
Employed	174	28.1
Unemployed	18	2.9
Student	48	7.7
Housewife	372	60.0
Incapacitated	1	0.2
No information available	7	1.1
Total	620	100

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Table 2
Employment Status of Interviewed Women According to Marital Status

Economically Active	Single	Married	Divorced	Widowed	Common-law marriage	Separated	Total
No	55	204	0	23	107	19	408
Yes	51	61	5	7	35	33	192
Total	106	265	5	30	142	52	600

Table 3
Reasons For Current Contraceptive Use

Reasons	Number	%
Doctor recommended it	4	1.6
Husband unemployed	1	0.4
Currently employed	8	3.2
Illness	9	3.6
To enjoy marriage	4	1.6
Gives us more freedom	1	0.4
Have enough children	30	11.9
Financial problems	87	34.5
Problems giving birth	11	4.4
For child spacing	65	25.8
Other	32	12.7
Total	252	100

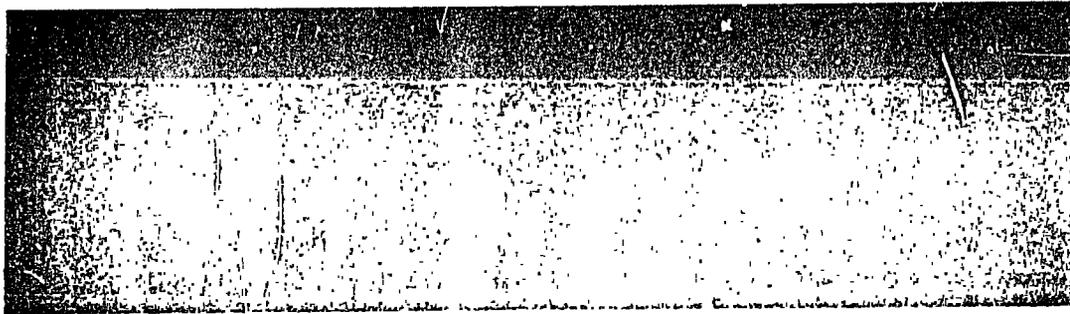
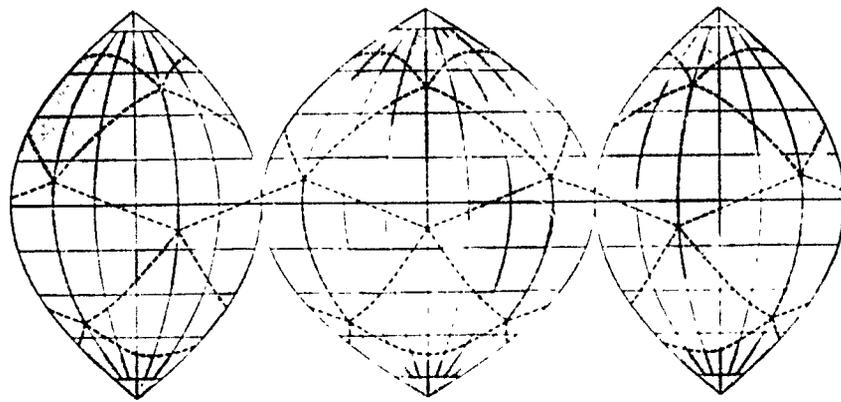
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Table 4
Reasons for Not Wanting More Children

	Interviewed women		Opinions of the interviewed women on husbands' reasons	
	Number	%	Number	%
Financial problems	181	49.5	124	46.4
Age of father or mother	93	25.4	62	23.2
Could not educate more children	28	7.7	25	9.4
Cause difficulties	11	3.0	8	3.0
Want more freedom	0	0.	25	9.4
Other	53	14.5	23	8.6
Total	366	100	267	100
No information available	7		14	

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