NEW MEASURES FOR NEW DEVELOPMENT GOALS:

POVERTY AS A WOMEN'S ISSUE

Report Submitted to AID/WID

Grant AID/otr-G-1592

April 1979

International Center for Research on Women

Washington, D.C.

Organizing Committee:

Mayra Buvinic
Nancy Birdsall
William P. McGreevey
Thomas Merrick

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The Second Sex in the Third World: Is Female Poverty a Development Issue?

Nancy Birdsall
Economic Growth Center
Yale University

William P. McGreevey
Human Affairs Research Centers
Battelle Memorial Institute

Women are indeed the second sex in the Third World--the poor countries of Asia, Africa, and Latin America. They are less educated, probably earn a lower return to what education and skills they have, and have fewer occupational options than men. Married women with young children work more hours per day than men. Women--especially unpartnered women--are much more likely than men to be poor in the first place, and in most cases their burdens are greater, for they must both care for children and contribute to the family income. Women bear double responsibilities: in agriculture, marketing, and crafts they are income-earners, and they are the guarantors of the well-being of the next generation, supervisors of society's investment in its precious human capital, and providers for children of what little the poor can provide of basic human needs--the nutrition, health, and schooling that now are viewed as part of development.

To development policy makers and planners, however, the link between such facts about Third World women and the larger problems of poverty, inequality, hunger, and unemployment is not at all clear. Is there, after all, a woman's issue where development and poverty are concerned? The

Note: The authors are grateful for the help in preparing this paper of Mayra Buvinic and Thomas Merrick.

research findings discussed in this paper (which were presented at the International Center for Research on Women's Conference on Women in Poverty: What Do We Know?) make the answer clear: emphatically yes. Both the needs and contribution of poor women are special; different from men's in ways that command qualitatively different solutions. But policy makers and planners have been slow to acknowledge that improvements in the lives of poor men will not necessarily trickle down to the benefit of the poor women. Indeed, women constitute the last bastion for the trickle-down theorists; few still advocate this largely discredited approach to economic development, but there is still an implicit assumption that solving the problems of poor men will automatically solve the problems of poor women.

As we begin our exploration of what exactly the woman issue is in poverty and development, one point deserves special emphasis. Attention must go not only to the welfare issue--How are women affected by development?--but also to the efficiency and growth issue--How do women affect development? Most findings discussed below bear on both questions; indeed, the distinction, though logically important, does no justice to the complicated reality. Women who do not benefit from economic growth, because they have limited resources, cannot contribute positively to further growth; and women who contribute little to overall growth are not likely to benefit much from what growth does occur. For those concerned with policy and program design, the efficiency/growth issue may have greater immediate appeal; yet as will become clear, women's plight, at first glance no more than a welfare issue, itself affects efficiency and growth in the overall economy.

Women's poverty as a development issue is the theme of the following discussion of some new and important facts about the real world of poverty

among Third World women: first, women and work--poor women's special contribution; then, women and want--women's peculiar needs.

Women and Work: Women's Contribution to the Household

Scholars and feminists anxious to underline women's economic contribution in poor countries have admirably documented women's work in the demonstrably productive sectors, such as agriculture and marketing.[1] But emphasis on women's market contribution has led to relative neglect of the value of work in childrearing and household maintenance, perhaps reflecting a tendency to underrate the real work content of "housewifery" in capital-scarce economies. For poor women in poor countries, so-called housework involves physical labor--sowing and weeding, fetching water, grinding wheat and corn; it is also likely to require from some family members many more person-hours of childcare, simply because there are more children.[2]

Much of this work that women do is outside of the marketplace of wages in which men place their services or the fruits of their labor. In censuses and employment surveys, where work has been defined as an activity that produces cash income, women have been treated inconsistently

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[1] Ester Boserup set a high standard in this genre, with her book Woman's Role in Economic Development (London: George Allen & Unwin, 1970). See also the SIGNS, Vol. 3, No. 1 (Autumn 1977), which includes papers given at the 1976 conference on women and development at Wellesley College.

[2] In Colombia, low-income families have nearly three times as many children as high-income families. See Joseph E. Potter, "The Distributional Consequences of Different Fertility Decline", paper delivered at the 1978 meeting of the Population Association of America, Atlanta, Georgia, table 1. In Nigeria, 70 per cent of a sample of urban Yoruba women in the 25 to 34 age group had spent more than half of their adult lives either pregnant or breastfeeding; see Judith Harrington "Nutritional Stress and Economic Responsibility: A Study of Nigerian Women," tables 3 and 4, elsewhere in this volume.

or overlooked altogether.[3] The unpaid family worker in a small shop or on a farm is the first casualty of the misleading statistical categories "employed," "unemployed."

The answer to such false distinctions is the time-use survey, which provides a careful check on how people in poor households use their time. Time is perhaps the most important--in the poorest households, the only--resource which the poor have available to them. U.S. women work at home and outside the home an average of 6 hours per day; women in Bangladesh work 11 hours (figure 1). Poor families have little schooling, few tools, virtually no capital, and often no land. In the way they use their time can be found the answer to who contributes to the household economy. Time can budget surveys demonstrate indisputably what employment surveys previously barely implied: women make an enormous contribution to the real income and well-being of the poor.

For several poor countries, and for those among the poorest in those countries, we now have a rich mosaic of information on the allocation of time by all family members to various activities inside and outside the household. From this mosaic emerges a simple, if striking, picture. Men devote almost all their work time to work that produces either wage income or income in the form of agricultural production directly consumed. Men's work at home does not vary with the numbers, ages, or activities of household members. Women, in contrast, devote their work time to a combination of market work (generating cash income or income-in-kind) and home maintenance, food preparation, and childcare. Children share the household

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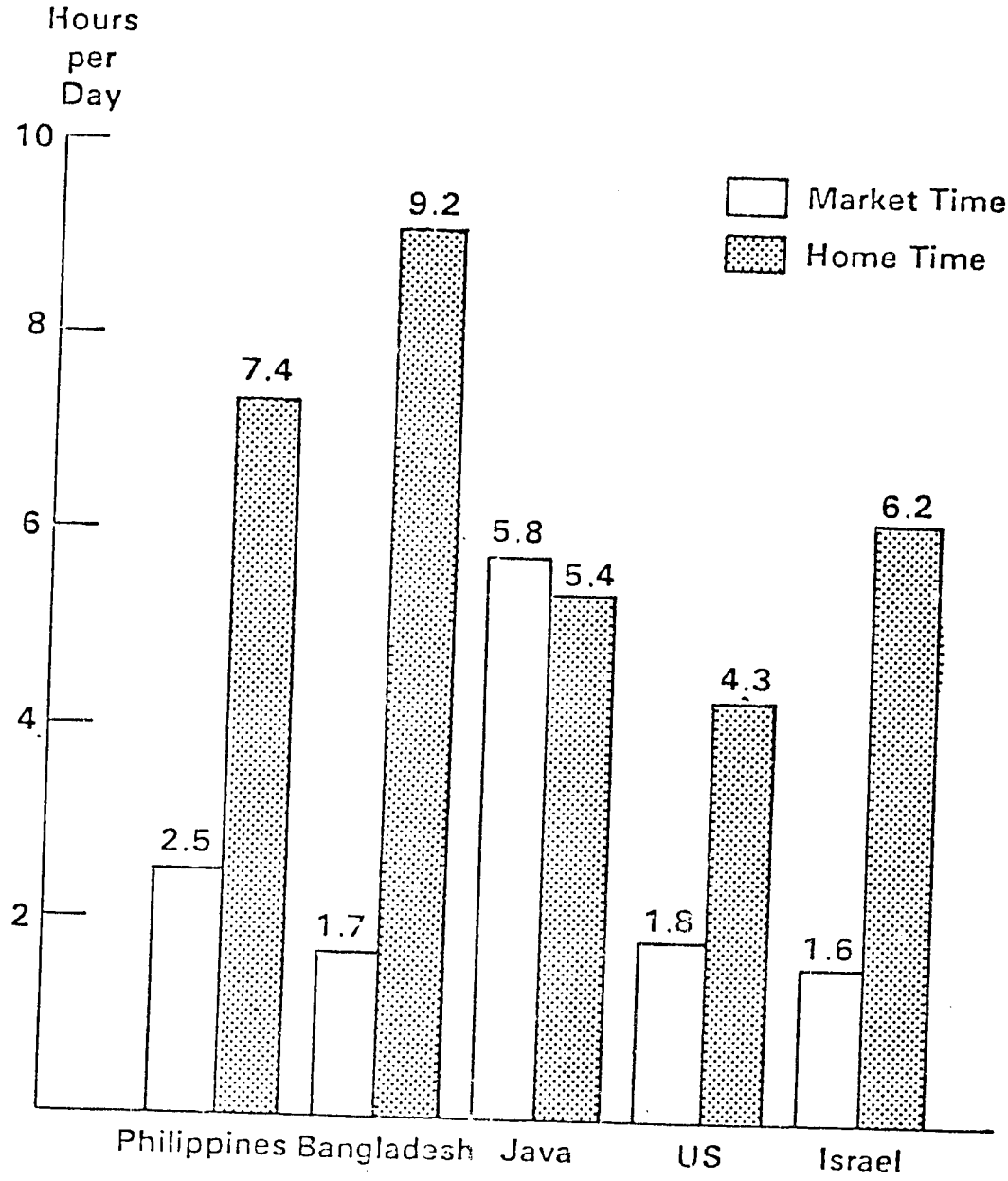
[3]Boulding suggests that the census category "economically inactive housewife," still utilized in 34 countries, be abolished altogether. Forty-one percent of women in North Africa/Middle East and 37 percent in Latin America fall into the census category "unaccounted for". See table 2 in Boulding, "Productivity and Poverty of Third World Women: Problems in Measurement."

Figure 1

Cross-Country Comparison of Women's Use of Time

(hours per day)



SOURCE: Based on Elizabeth K. Quizon and Robert E. Evenson, "Time Allocation and Home Production in Philippine Rural Households," table 10.

work from about their fifth year onward. Children also do a considerable amount of marketplace work after about their tenth year. Time allocation by women and children is flexible, changing with the number and ages of children and the annual cycle of agriculture and schooling (when children do go to school). As the demand for childrearing time and cash income increases over the household's life cycle, the burden falls primarily on the wife and to some extent on older children.

Time-use studies thus demonstrate several reasons why market income (cash and subsistence crops consumed at home) is not a good measure of household well-being:

* Market income fails to measure the contribution of at-home work, which is estimated to be at least 40 per cent of GNP in the United States and probably more in less monetized economies.
* Women increase a family's market income at the cost of reducing either their leisure or the attention they can give to childcare; the latter is in considerable measure an investment in human capital.

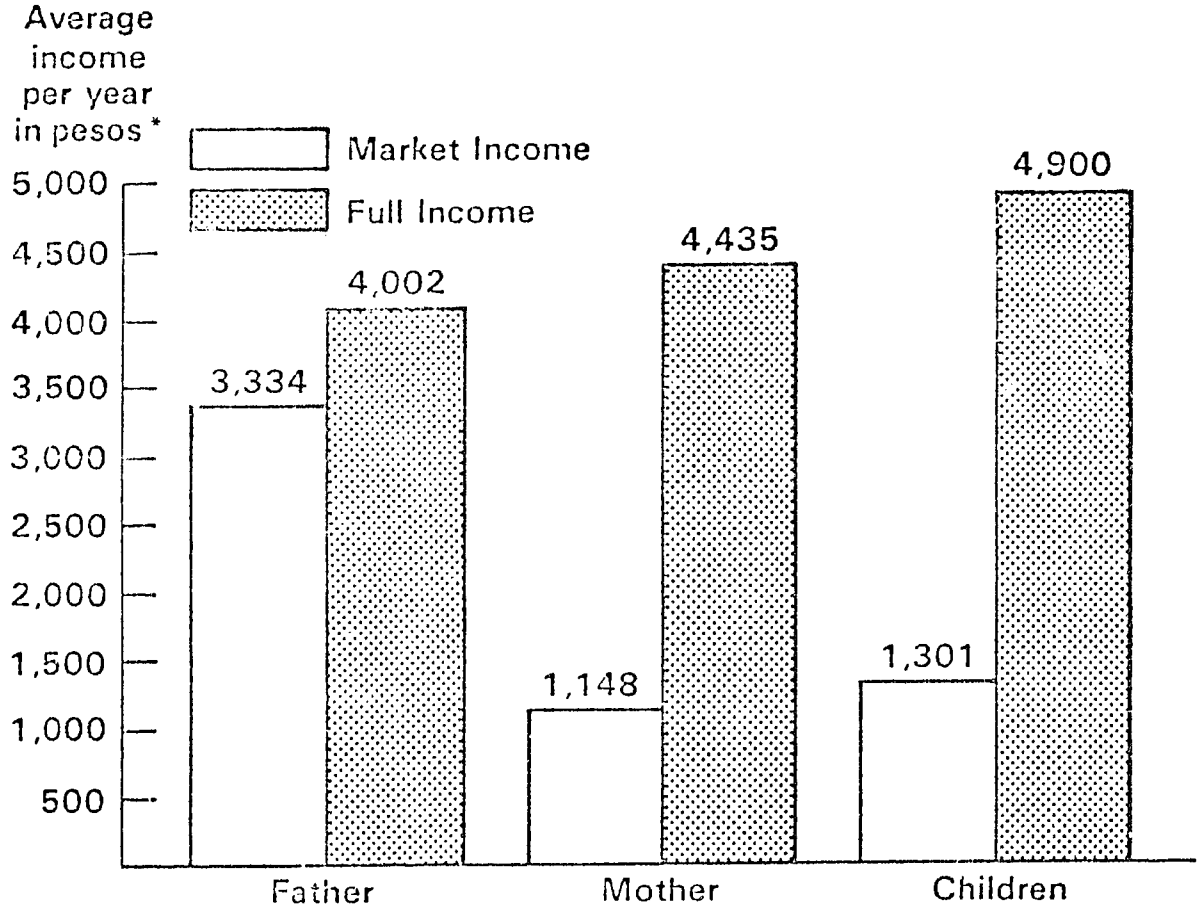
The measurement of time use in rural households has for the first time made it possible to estimate <u>full</u> income, i.e., income measured by adding to market income payments family members would receive if childcare, food preparation, breastfeeding, fetching water, chopping wood, and other home production activities were valued and paid for explicitly. For rural households in the Philippines,[4] what do we find?

1. The father garners the largest proportion of average household market income, but women and children together bring in almost 50 per cent of this market income (figure 2);

[4]These statements are based on findings reported in two ICRW Conference papers: Quizon and Evenson, "Time Allocation and Home Production in Philippine Rural Households, and Popkin, "Women, Work, and Child Welfare."

Figure 2

Market Income and Full Income for Family Members, Laguna, Philippines, 1975-76



*In 1975 the rate of exchange was about 7.4 pesos to U.S. $1.00.

NOTES: Market income is the value of market production. Full income is the total value of both market production and home production. Children's full income includes time spent in school. Excluding it, children's full income is equivalent to 3362 pesos per year.

The data are based on direct observations of a random sample of 99 rural households in Laguna in three separate 24-hour visits over an eight month period.

SOURCE: Quizon, Elizabeth K. and Robert E. Evenson. "Time Allocation and Home Production in Philippine Rural Households."

2. If home production and school activities are added to market production, so that full income is considered, mother contributes slightly more than the father, and the average of four children per family as a group contribute more than either parent (figure 2);
3. Full income is higher, by about 16 per cent, in households where mothers are employed;
4. Additional cash income from working mothers purchases, on the average, 145 calories and 3 grams of protein daily for each child;[5]
5. But since the time a mother spends with each child affects his or her height and weight for age positively, the gain to children from this additional food may be partially offset by the loss of mother's attention when she works away from home.

Tradeoffs Among Market Work, Childcare, and Leisure

In the rural Philippines, the father's time in home production (childcare, food preparation, marketing, and other chores) is 1 to 2 hours daily, whether there is one child or seven.[6] Filipino women spend about 3 hours per day in market production (wage employment, farming, fishing, income-earning home production)--more if they are farmers--and 7 to 8 hours in home production)--slightly less if they are farmers. Women with infants spend almost 9 hours in home production, and reduce their market time to about 2 hours; they reduce leisure time more than market time. Women with seven or

[5]Popkin, table 6 on food purchases, and table 7 on effect of mother's time on children's height and weight.

[6]The non-farming man spends more time in household work than the farmer, but still less than one and one-half hours. Only the man who works for four hours or less a day increases his contribution to the household (Quizon and Evenson, tables 3 and 4).

more children spend less time in childcare and home production than those with fewer children, but increase proportionately their time in the market. In large families, older children take on some of the mother's home chores, including childcare.

Rural Filipino women working for cash income give up nearly 4 hours per day of leisure (figure 3). Older children substitute for the mother in home chores and care of siblings (figure 4). When there are seven or more children men actually reduce their childcare time (to about 10 minutes a day!) and increase their leisure time[7]: older children reduce the father's but not the mother's work load. When the family is large, women enjoy significantly less leisure than men; this is especially true if there is an infant present, and especially true for women who work more than 6 hours a day outside the home.

Time-use data tells us that the tradeoff between mother's work for cash income and children's well-being is minimized when mothers choose occupations that allow flexible hours or permit them to bring children along. Poor women adjust the hours they work in a given occupation as their childcare responsibilities change; they do not change occupations. Between Malaysian women with young children and those without, there are virtually no differences in the proportions who work in agriculture, marketing, cottage crafts, the professions or management[8]; the expectation of childcare

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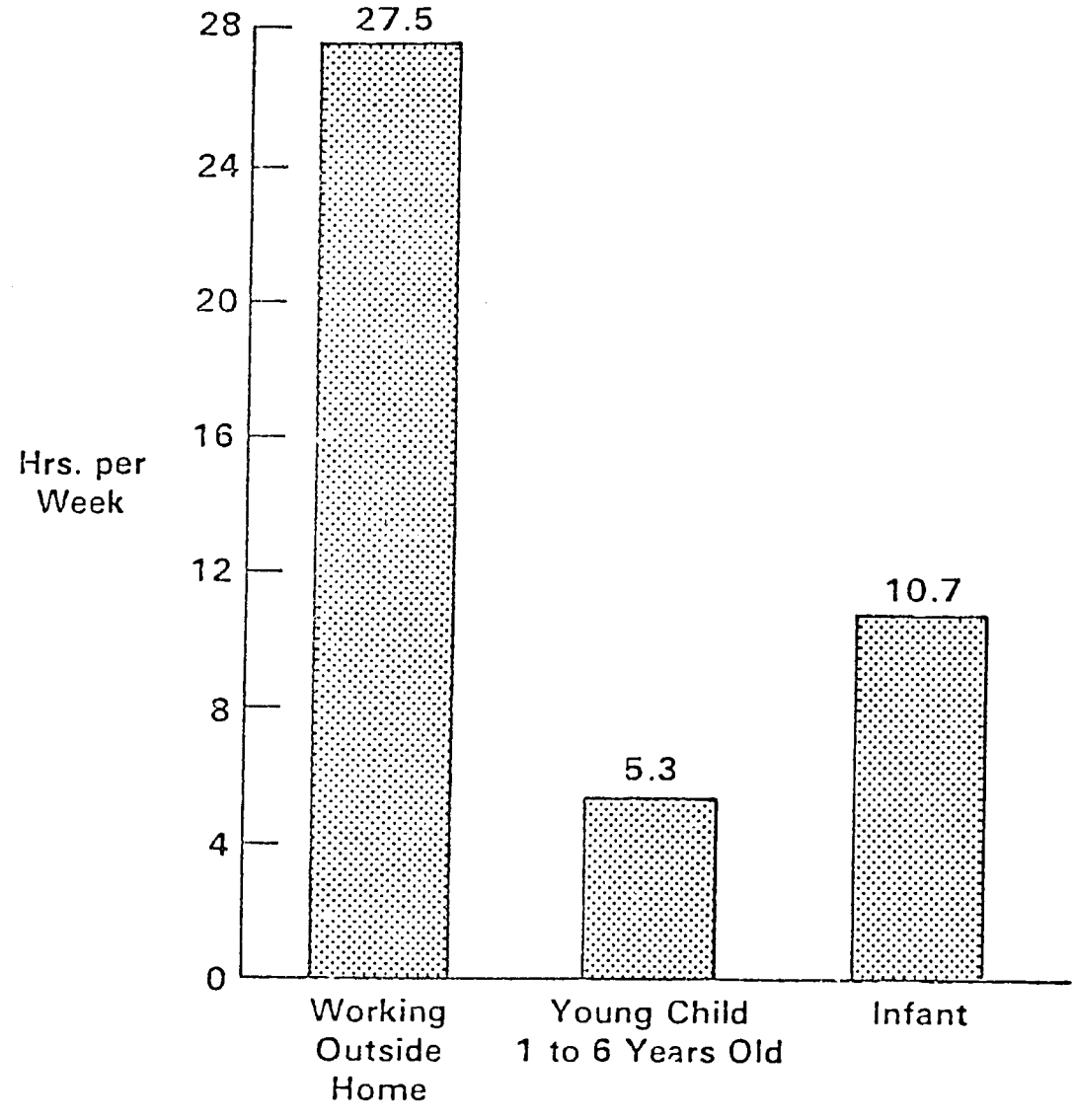
[7]Leisure includes personal care (including sleep) recreation, and church and festival activities. Some conference participants questioned whether the last category should be defined as leisure.

[8]Statements on time use of Malaysian family members and women's occupations in Malaysia are based on findings reported in DaVanzo and Lee, "The Compatibility of Childcare with Labor Force Participation and Nonmarket Activities: Preliminary Evidence from Malaysian Time Budget Data."
Less than 5 per cent of all women reported working in the professions, management, or as clerical workers. Only for clerical workers was there a statistically significant difference between proportions of women with and without young children (DaVanzo and Lee, table 1).

Figure 3

Hours of Leisure per Week Given Up by Rural Mothers, according to Purpose, Laguna, Philippines, 1975-76.



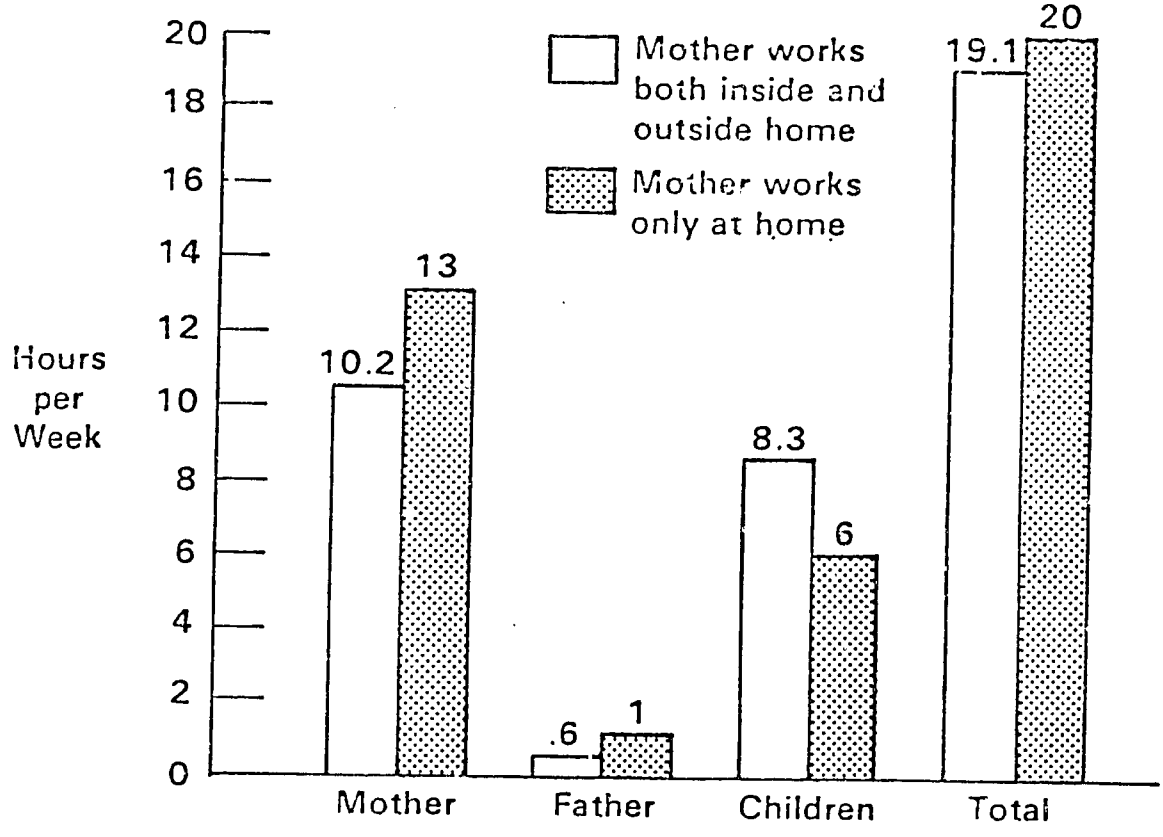
NOTES: Mothers who work outside the home give up nearly 28 hours a week of leisure or sleep, as compared to those who work only within the home. Each young child requires an additional 5.3 hours per week of childcare; an infant, about 10.7 hours.

The data are based on a representative sample of 571 households in 34 "barrios" in the province of Laguna.

SOURCE: Barry M. Popkin, "Women, Work, and Child Welfare," table 2.

Figure 4

Hours per Week Spent on Childcare by Family Members
according to Work Location of Mother
Laguna, Philippines, 1975-76



NOTES: When mother works away from the home, the number of hours she spends on childcare falls by about three hours per week. That time is made up mostly by older children. Time spent on childcare by the father is less when the mother works.

The data are based on a representative sample of 571 households in 34 "barrios" in the province of Laguna.

SOURCE: Barry M. Popkin, "Women, Work, and Child Welfare," table 2.

responsibility, or the fact of having once had such responsibility, governs the occupation of even those women who do not currently have young children. Most Malaysian women do marketplace work in agriculture, sales or marketing, and cottage industries. Fifty per cent of the women in sales (marketing) and cottage industry occupations (weavers, dressmakers, food and beverage processors) have children with them while working. Only one quarter of women in agriculture bring their children with them, but women in agriculture work only about half the total hours worked by women in marketing.[9] The women in marketing with children under age five reduce their hours proportionately more than women in agriculture with such young children.

As in the Philippines, Malaysian women contribute about two thirds of total family time to home activities--childcare, washing, shopping, meal preparation, and house cleaning. Children contribute another 20 per cent, and husbands less than 10 per cent. Husbands do even less in families with older children. Children do more when the mother works for cash income.

In rural Peru, mothers and children also substitute for each other in cooking, hauling water, and animal care.[10] Daughters are much more likely than sons to help with cooking and washing, and, after age ten, to substitute for the mother on a meal-by-meal basis. Daughters are also more likely to haul water and collect wood. Animal-raising is an important activity for women and children. Raising sheep, for example, is easier with

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[9]This is consistent with work in agriculture being physically more difficult, and work in marketing having a larger social, somewhat leisurely component.

[10]Statements on family members' activities in rural Peru are based on findings reported in Deere, "Allocation of Familial Labor Deployment and the Formation of Peasant Household Income: A Case Study of the Peruvian Sierra ."

a child at home, either to pasture full time, or to replace the mother in cooking and cleaning. In 11 per cent of households, a daughter raises sheep full time; sons do so in only 2 per cent of households. Girls attend fewer years of school than boys.

In urban Peru (Lima), it appears that market women choose that occupation for the specific reason that it is compatible with childcare.[11] Children also assist in important ways--accompanying market mothers to the wholesale market, carrying goods to the stall, bringing lunch from home to their mother. Eight-to-twelve-year-olds are often able to sell, handle money, and market food like an adult, temporarily replacing mothers who have to be home with a sick baby. But a quotation from one woman illustrates the tradeoff urban market mothers face between income-generating activities and the welfare of their children:

> Sometimes everything is so hard! Shortages of certain products make it so tough for us. It is then my children practically don't go to school, they are exhausted and go to sleep in class, under the teacher's nose. The school year ends and my children are behind. I blame myself because I've had my children stay awake all night helping me out at the wholesale market. When I see them so tired it breaks my heart and I feel so guilty and powerless![12]

Mothers and children assist each other, in home and market, leaving any husband or mate unencumbered. Crises are resolved with the collaboration of children and the market worker's mother or sisters, and, in rare

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[11] Statements regarding Lima women are based on Bunster, "Women and Work: The Market Sellers of Lima."

[12] Bunster reports that conditions in the Lima markets are not suitable for children; poor sanitation and garbage collection increase the incidence of sickness, especially among children, forcing women to forsake income to stay home, or to have older children skip school to care for a sick child or to stay in the market stall. The wholesale and retail markets could be organized to minimize the large amounts of time market women spend crossing the city. Market women are harassed by municipal inspectors for failing to conform to regulations which would prevent them from participating in the market at all.

cases, the husband or mate. Women interviewed preferred their work outside the home, where they had a window to the world; but all complained about the difficulty of getting enough sleep due to their double roles as homemakers and market-sellers.

Any tradeoff between women's work outside the home and child welfare arises most obviously with breastfeeding. Breastfeeding increases a child's chances of survival. Malaysian women who have held a job in the two years prior to a child's birth are seven percentage points less likely to breastfeed their child than women who have not.[13] Among women who do breastfeed, those who have been recently employed breastfeed an average of 4-1/3 months less, which is one third less than the mean length of breastfeeding in the sample.

Nutritionists and those concerned with high infant mortality in poor countries unequivocally advocate breastfeeding. Those concerned with reducing fertility similarly encourage it because of its birth-spacing effect. Yet Malaysian women trade off--more and more each year--breastfeeding for other uses of their time. Figure 5 shows that in Malaysia breastfeeding has declined as a contraceptive method since 1950. Women have substituted the pill as a means of contraception.

Breastfeeding is not for every woman the preferred method of contraception or of infant nourishment. For example, educated Malaysian women breastfeed less--apparently because of the jobs they hold. (When job variables are included, education itself has no significant effect on the propensity to breastfeed.)

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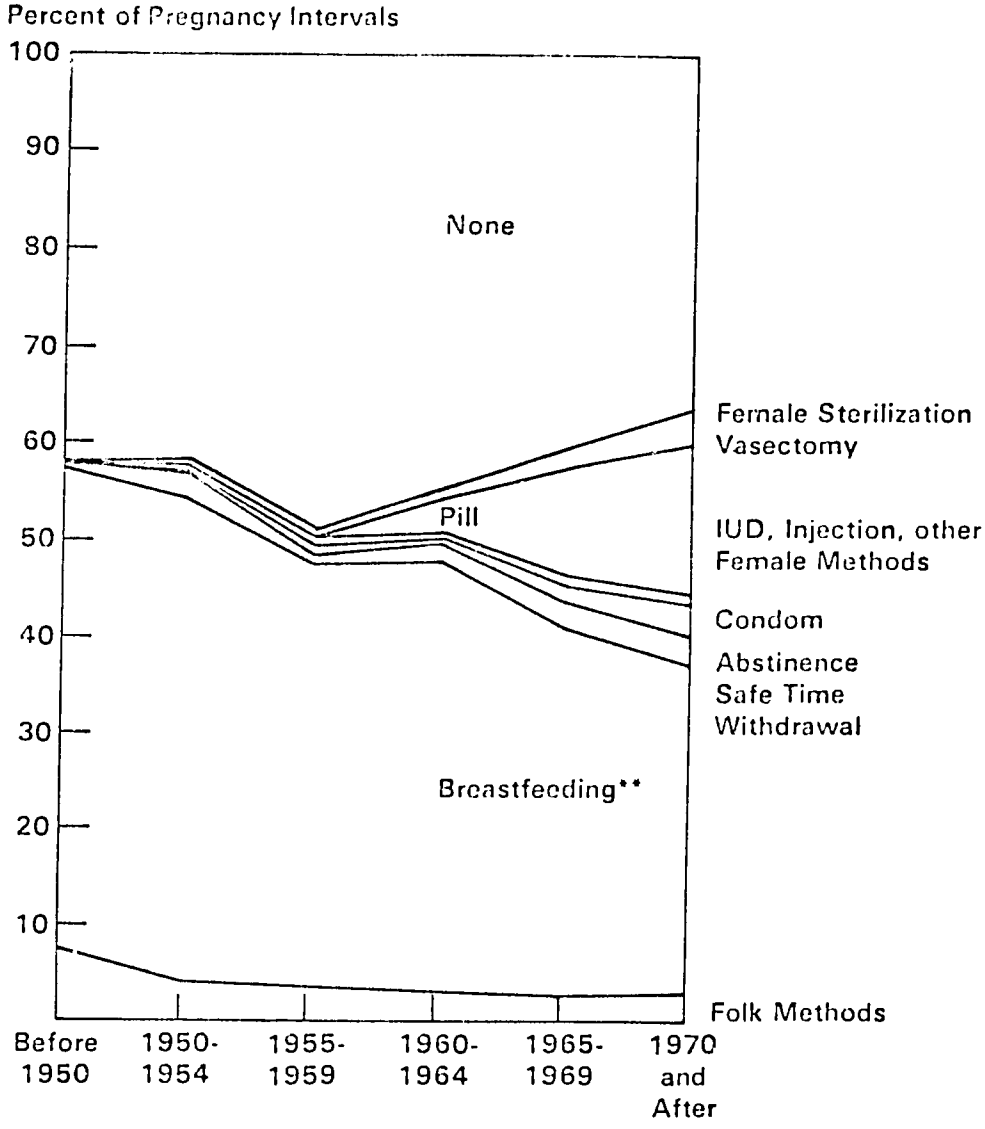
[13] Statements regarding breastfeeding effects and trends in Malaysia are based on findings reported in Butz and DaVanzo, "Economic Influences on Breastfeeding, Contraceptive Use and Birth-spacing in Malaysia."

Figure 5

Types of Contraceptives Used, By Year, (Proportion of pregnancy intervals in which a contraceptive method was used). Malaysia 1976-77



The sample for this figure includes vasectomies and hysterectomies. Breastfeeding is included in this figure only if the mother reported using it in the interval *in order to delay the next pregnancy*.

NOTE: Data were obtained in the first round of a three-round survey in 52 primary sampling units throughout the country with a sample of over 1200 households.

SOURCE: Butz, William P. and Julie Da Vanzo. "Contracepting, Breastfeeding and Birthspacing in Malaysia. A Model of Decision-making Subject to Economic and Biological Contraints."

There is justifiable concern over multinational corporation sales practices which discourage Third World women from breastfeeding; but over the longer run such concern should not blind policy makers to women's work aspirations and the contributions marketplace work can make to women's status and family income. Advocacy of breastfeeding can be complemented by other policies to ease the multiple demands on women's time.

The Tradeoff Between Fertility and Income

Why do women have such difficulty earning a living? The problem is only partly a somewhat lower level of education; more important is their choice of informal work with flexible hours. In Belo Horizonte, Brazil, male and female heads of households do not differ markedly in age or education, but more than 50 per cent of the females work in the informal sector, compared to 12 per cent of the males (figure 6). And, although working in the informal sector has a significant negative effect on male earnings, the negative effect for females is twice as great (figure 6).[14]

The earnings differential by sex may reflect differences in the number of hours worked over the period. However, if female heads of households work fewer hours in the market because of their household responsibilities, their lower monetary income may be a reasonable reflection of their lower welfare, even if market hours are not controlled for. Furthermore, males earn more in the informal sector than do females in the formal sector (figure 7); and they earn a higher return on what education they have.[15]

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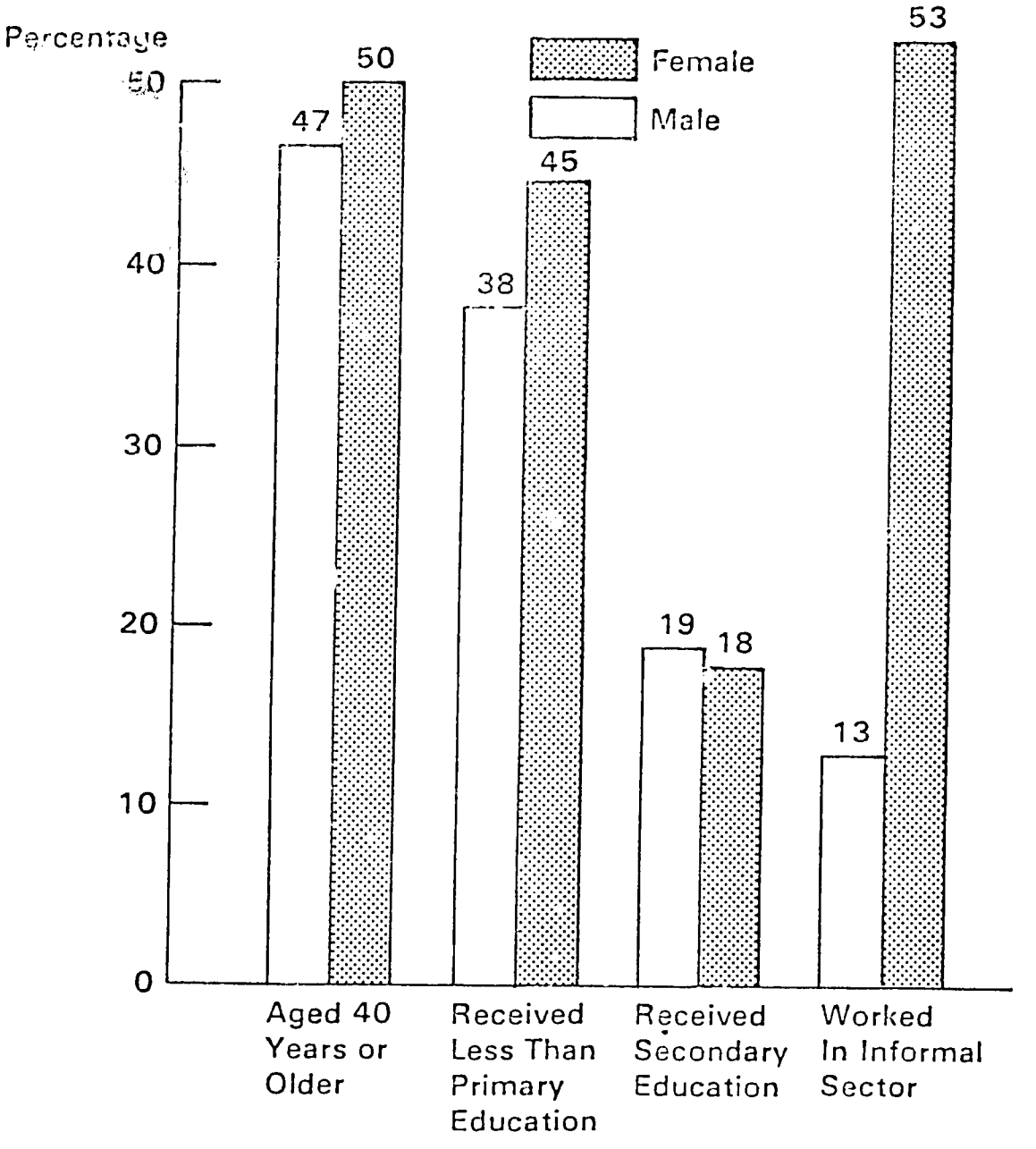
[14] Statements regarding female heads of households in Belo Horizonte are based on findings reported in Merrick and Schmink, "Households Headed by Females and Urban Poverty in Brazil." The result regarding the returns to education and differences in earnings are from tables 8 and 9.

[15] Merrick and Schmink, table 8.

Figure 6

Percentage of Male and Female Headed Households according to Age, Education and Employment Sector Catagories Belo Horizonte, Brazil, 1972

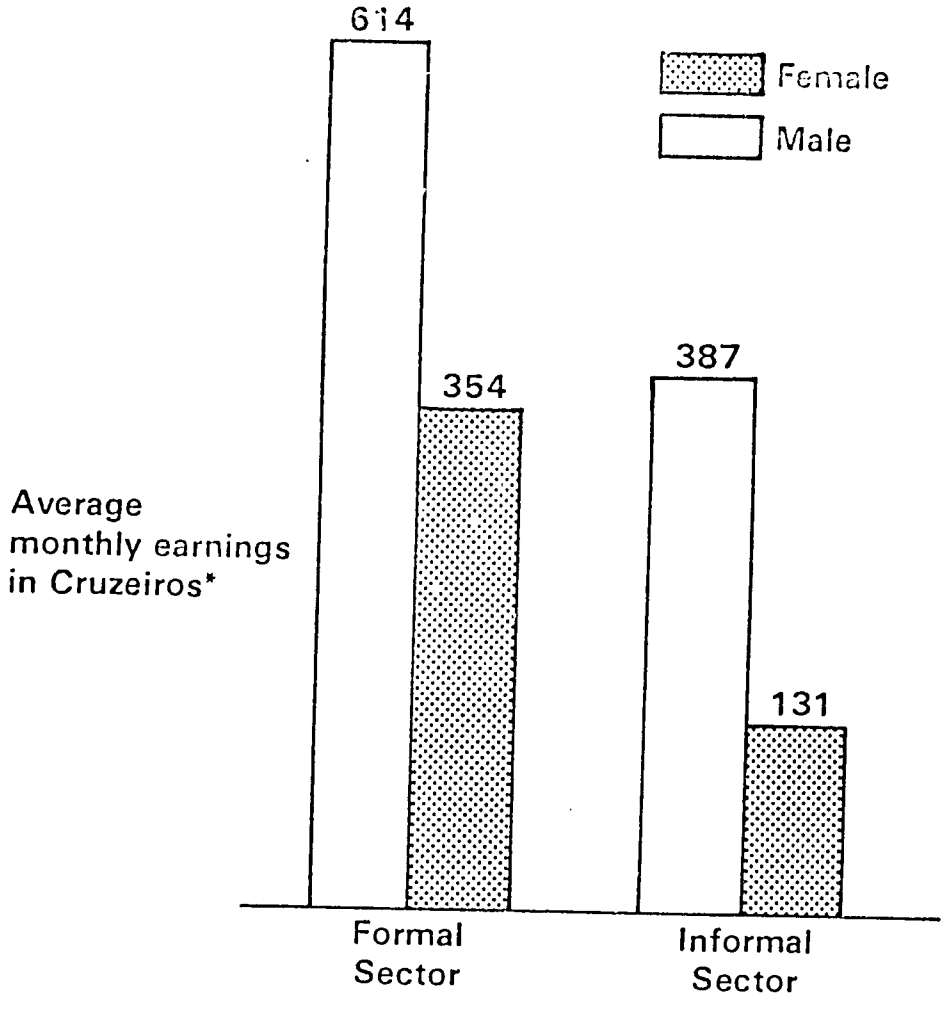


NOTES: These figures are based on responses from 1,420 men and 226 women drawn from a representative sample of 2445 households in the Belo Horizonte metropolitan area.

SOURCE: Thomas W. Merrick and Marianne Schmink. "Households Headed by Females and Urban Poverty in Brazil," table 8.

Figure 7

Average Monthly Earnings in Cruzeiros of Male and Female Heads of Households by Employment Sector, Belo Horizonte, Brazil, 1972



*In 1972, the rate of exchange was about 6.25 Cruzeiros to U.S. $1.00.

NOTES: The data are based on responses from 1,420 men and 226 women drawn from a representative sample of 2445 households in the Belo Horizonte metropolitan area.

SOURCE: Merrick, Thomas W. and Marianne Schmink. "Households Headed by Females and Urban Poverty in Brazil."

As a result, households headed by females are much more likely to be poor than are households headed by males; an alarming 41 per cent of all households headed by females in the Belo Horizonte sample had a total income too low to satisfy the most fundamental needs, even by the government-established minimal standard. Twenty-seven per cent of male-headed households were so classified.[16] A very similar picture appears for the Commonwealth Caribbean: About one fifth of the households headed by males had no income or none stated, but 59 per cent of those headed by women were so classified. Over half the male-headed households were in the high-income category (more than $1,000), but only 13 per cent of those headed by females were.[17]

The data available from time-use studies demonstrate that poor women make a large contribution to their families' well-being through their work inside the home as well as through their income-producing work outside of the home. There is no question that their production is important to their communities. The data also show the struggle of these women to balance market work with the demands of housework and childcare--especially the latter. The conflict between the need to care for children and the need to bring in income affects these women's decisions about what kind of work to do and for how many hours. The fact that they work in the informal sector, which provides the flexibility they need, means that they cannot earn very much. In order to work at all, they must have the help of their children, who in turn must give up school in order to help provide subsistence for their families. Women and children are thus caught in a cycle of poverty.

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[16]See Thomas Merrick, "Household Structure and Poverty in Families Headed by Women: The Case of Belo Horizonte," paper presented at the 1977 meetings of the Latin American Studies Association, Houston, Texas.

[17]See Mayra Buvinić and Nadia H. Youssef, "Women-Headed Households: The Ignored Factor in Development Planning," Washington, D.C.: Office of Women in Development, AID: 1978, table 12.

Women and Want: Why are Women Worse Off?

At what age do women start down the road of working-age poverty? Up to about age ten, parents favor boys only slightly with their time and goods, studies in the Philippines and Guatemala show; but boys and girls are treated very differently from a social point of view. After the age of ten girls are less likely than boys to continue in school and more likely to spend time with younger siblings as mother-substitutes, in a role consistent with the earlier differences in social treatment.

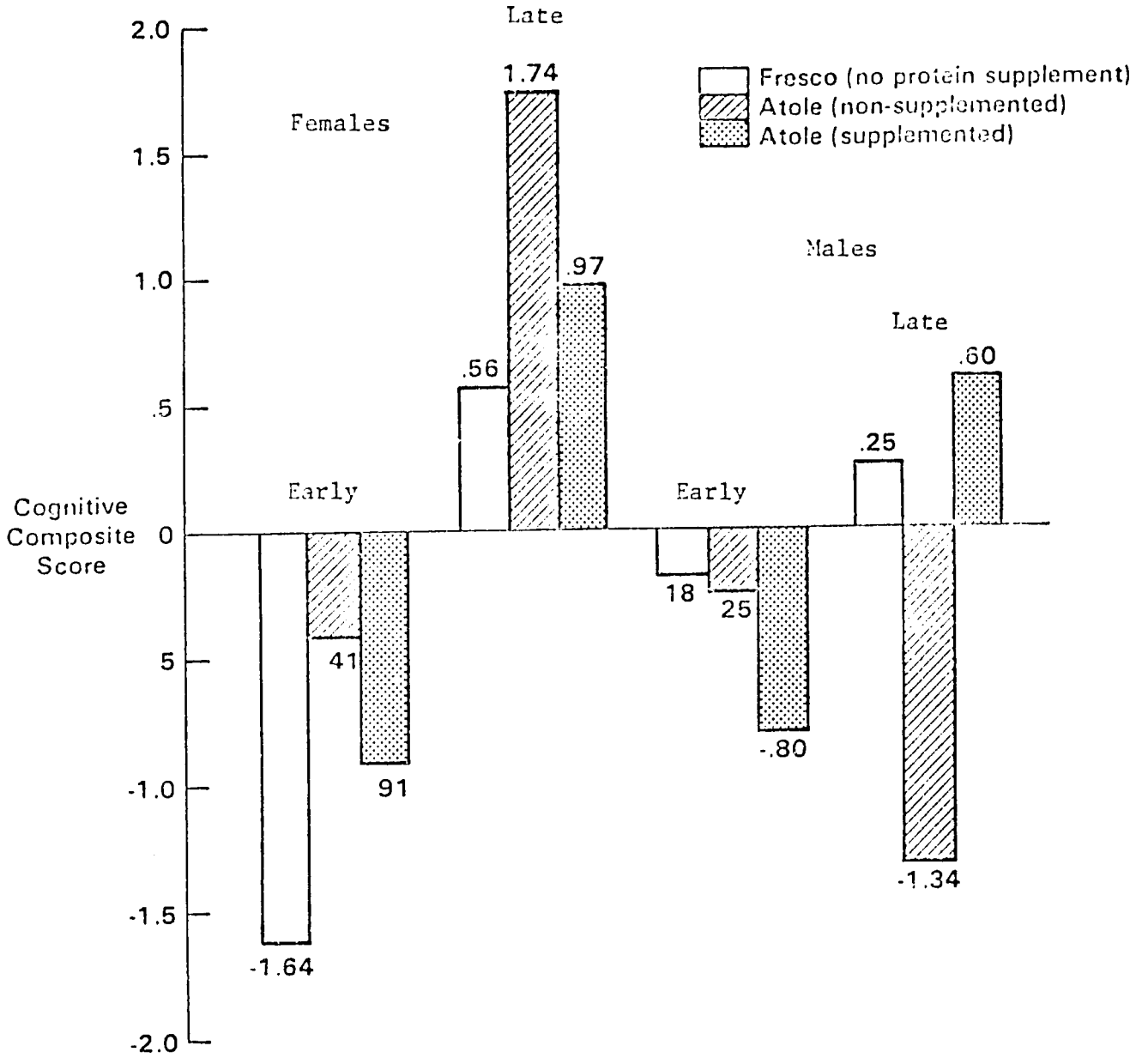
Measures of the mental and physical development of all children in several Guatemalan villages were taken over a seven-year period as part of a study of effects of a nutritional supplementation program. No differences were found in the physical environment of boys and girls; reported home diets, prevalence of diarrhea, and length of lactation were similar for children of both sexes.[18] Despite the apparent similarity for boys and girls of diet, lactation, and morbidity, the mental development scores of girls, particularly those given a protein supplement, improved much more than the scores of boys receiving the supplements (figure 8). Do the supplements themselves explain the differential in improvement between boys and girls? No.[19] The nutritional program apparently affected the mental development of girls more than boys by accidentally creating a new social environment for girls. The program involved a large number of female personnel; about six women were present in villages each day. All homes

[18]Guatemala results are from Patricia Engle's ICRW Conference paper, "Sex Differences in the Effects of Nutrition and Social Environment on Mental Development in Rural Guatemala." She cites Sara Nerlove on children's play activities.

[19]According to Engle supplementation appeared to help most girls from the poorest families, and boys from better-off families, perhaps because "when resources are scarce, boys are treated preferentially."

Figure 8

Mean Cognitive Scores of Three Year Olds by Cohort* and Supplement History, Rural Guatemala, 1969-77.



The first three years vs. the last three years.

NOTES: Data were obtained in a INCAP 7 year longitudinal study of malnutrition and mental development in Guatemala.

SOURCE: Engle, Patricia. "Sex Differences in the Effects of Nutrition and Social Environment on Mental Development in Rural Guatemala."

were visited by a woman once every two weeks; a girl of about age 15 from each village was hired as an assistant. Children in the villages were observed "playing INCAP" (the acronym for the organization conducting the program), and pretending to be program personnel.

Could the chance to observe the female nurses, nutritionists, and program assistants have changed girls' expectation for their own future/ Prior to the program, girls had only their mothers to imitate. Of those women in the villages who earn any cash income, most are domestic servants or work at home in crafts or on the farm.[20] These limited options for adult village women are mirrored by sex-typing of child play and chores. Boys are much more likely to play far away from home than girls, and for young children there is considerable variation in chores by sex.

The implication is that better role models improve girls' test scores; improved test scores increase girls' success in school and the likelihood they will stay in school longer.[21] Education in turn influences girls' economic activities, their productivity, and what as mothers they transmit to their children.

A similar picture emerges in the Philippines.[22] Families spend somewhat more on food for boys than for girls, especially in the one-to-six-year-old

[20]Interestingly, 64 per cent of the women said they would like additional work for money, most preferring marketing or work at home (ironing, mending, washing). But to separate questions concerning possible conditions under which women might work outside the home (with young children, with older children, occasionally, full-time, or his own wife if she wanted to), 76 per cent of the husbands said no to all five conditions.

[21]Girls are sent to school or choose to stay only when they are smart enough; this is less true for boys in the same villages, for whom schooling is more a function of family income.

[22]Family inputs to children by sex in rural Philippines are reported in Navera, "Home Investment in Children in the Rural Philippines."

age group (400 and 287 pesos respectively), but this may reflect differential needs rather than any discrimination against girls. A more important difference is spending on schooling for teenage girls and boys. Parents spend 281 pesos annually for education of boys, but only 152 pesos annually for education of girls. Time inputs of parents also differ somewhat betwe girls and boys; mothers and fathers both spend somewhat more time with boys than with girls (figure 9).

Throughout the Third World, there are many more boys than girls enrolled in school. The ratio of females to males enrolled in both secondary and higher education is less than 35 per cent in almost all African countries at the secondary level and less than 20 per cent in almost all African countries at the higher level. For Latin America, the same ratios are about 50 and 40 per cent, and for Asia about 30 and 25 per cent.[23] If it is assumed that ability is distributed similarly between males and females, then it can be seen that the value added of the educational system is reduced when women do not attend school; an economy's return to education is maximized when the most able people attend at all levels.

Low enrollment rates for girls reflect parental expectations with respect to their daughters' choices and chances in life. Poor girls are left to choose between hiring out as domestic help, working as unpaid family labor, immediate marriage or some form of prostitution.[24]

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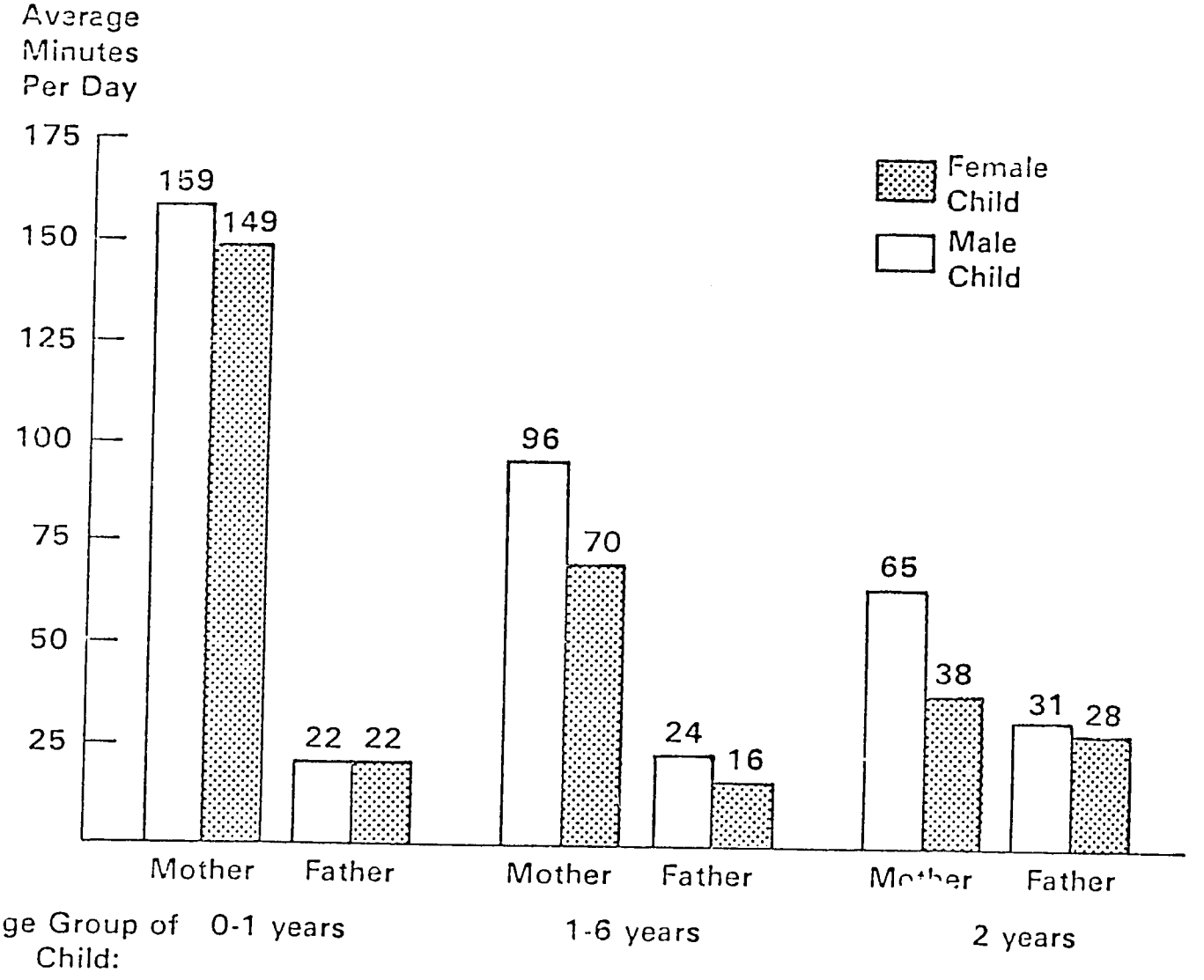
[23]Reported by Selowsky, "Women's Access to Schooling and the Value Added to the Education System."

[24]See Elsa Chaney, "Agripina: Domestic Service and its implications for Development," paper presented at the Primer Simposio Mexicano-Centro Americano De Investigacion Sobre La Mujer, (Mexico: November 1977). Judith Harrington spoke at the ICRW Conference on the large number of Nigerian women who migrate to urban areas and support themselves as "girlfriends" of married men.

Figure 9

Time Spent on Childcare
(in Average Minutes per Day per Child)
by Rural Parents
according to Sex and Age of Child,
Laguna, Philippines, 1976-77



NOTE: The data are based on a sample of 137 households.

SOURCE: Navera, Emeline. "Home Investment in Children in Rural Philippines."

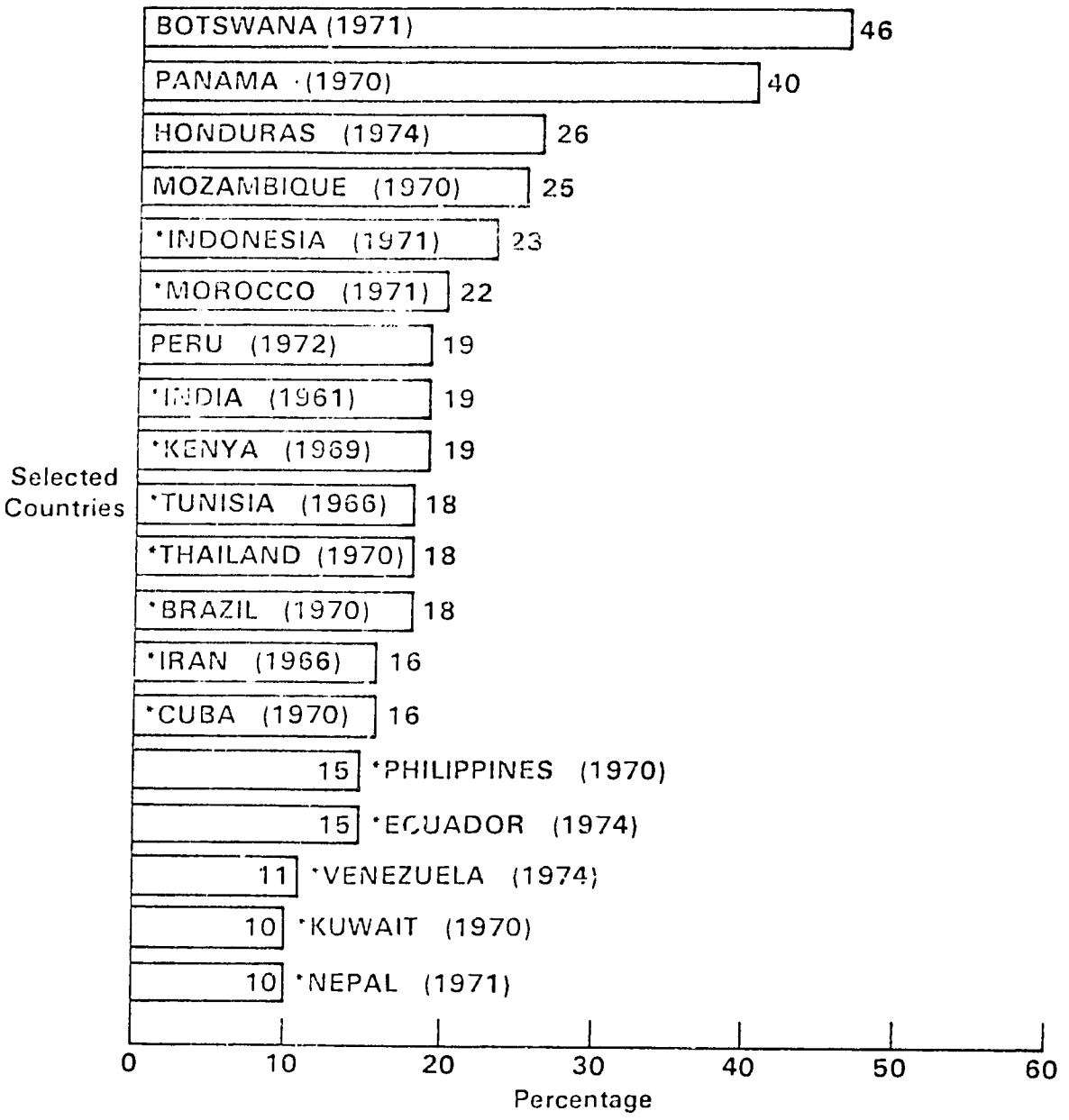
Few families foresee major income-earning responsibility for their daughters. Yet many of them may have to take on such responsibility, especially women who, because of divorce, dissolution of an informal union, or the death of a husband, become single mothers. We saw above that households headed by females in Brazil are more likely to be poor than those headed by males. Households headed by females are not unusual in the Third World.[25] They constitute 35 per cent of all households in many countries of the Caribbean; their proportion could be as high as 18 per cent in India, 23 per cent in Indonesia, 18 per cent in Kenya, and 15 per cent in Iran (figure 10).

For most countries, we have no information on the growth in the number of such households. Official definitions differ; interviewer and respondent attitudes change; comparing the incidence from one time or place to the next is difficult. Available data from Brazil, however, show that the number of households headed by women in that country nearly doubled between 1960 and 1970. This trend probably prevails elsewhere. Migration at differential rates by sex is one cause. Households headed by females increased by 33 per cent in Morocco between 1960 and 1971 (the number of those headed by men increased minimally), as Moroccan men migrated to Western Europe. In one district of Kenya, 40 per cent of the households sampled are headed by female farm managers. Among tax-paying households in Lesotho, 25 per cent are headed by females, reflecting male migration to the mines of South Africa. In Latin America, more women than men migrate to cities; households in Santiago, Chile, headed by migrant women had a median income of 49 escudos monthly in 1962; for native women the figure was 84, for migrant and native men 93 and 109 escudos, respectively.

[25] Information on female-headed households in the developing world is from the study of Buvinic and Youssef who review other literature and analyze what information there is in country censuses. See "Households Headed by Women in Third World Countries: An Overview."

Figure 10

Percentage of "Potential" Heads of Household who are Women in Selected Countries



*Single mothers are not included as data were not available.

NOTES: The magnitude of households that might be headed by women was defined by the percentage of "potential" women heads to "potential" total household heads. "Potential" women heads of household include all women who are widowed, divorced, separated or single mothers. "Potential" total household heads include "potential" women heads of household plus men over the age of 20 who are not single.

Data were obtained from national censuses or U.N. Demographic Yearbooks. Dates for the different data analyzed are given in parentheses in the figure.

SOURCE: Buvinic' Mayra, and Nadia H. Youssef. "Women-headed Households in Third World Countries: An Overview." Paper presented at the International Center for Research on Women Workshop "Women in Poverty: What Do We Know?" Belmont Conference Center, Elkridge, Md., April 30—May 2, 1978 (Table 2).

Only a few countries provide census tabulations indicating the number of children to women within categories of married, divorced, single; for the few that do, the child-woman ratio (including only women who are mothers) for divorced and widowed women ranges from 3.4 (Peruvian divorcees) to 5.1 (Botswana) to 6.6 (Honduras). Nor do widowed women necessarily have adult children to support them. In Guatemala, widowed and divorced women have five children at the age of 35, when support from adult children is still unlikely.

Single mothers must either work in the marketplace or count on some support system--either private (help from relatives or friends), or public (social welfare programs). With development, private support systems have deteriorated, but there has been no concomitant growth in public welfare. Female household heads are only the starkest examples of victims; all women, because of childbearing responsibilities, greater longevity, social restrictions on their labor force participation, and low wages, are more dependent for survival on some support system than are men.

Economic development stimulates internal and international migration and weakens traditional support systems. It is having the unintended consequence of multiplying the number of female-headed households. That fact in itself may not be bad; women may choose to live apart from men and even choose to abandon traditional avenues of support and thus exercise greater control over their own lives. However, few women are prepared by their home training and schooling to add financial support to their childcare responsibilities. A first step in providing such preparation is a wider awareness of the implications for women and for their children of these side-effects of development. Parents who realize that their daughters, as

well as their sons, face a different world from the one they have known can prepare children not merely to cope with poverty but to rise from it.

Women's Poverty is a Development Issue

Women's work outside the home is constrained by their responsibility for raising children. In poor countries, and especially in poor households, women choose occupations which enable them to adjust hours between home and market work as the family grows; they rely on flexibility and, later, the help of older children to assure themselves access to some cash income. Mothers work outside the home to increase household current income. Such work is probably a necessity for women heads of households. But it may imply a cost to the children's well-being as adults, particularly if they leave school to help mothers.

Mothering time increases chances for survival (in the case of breast-feeding) and improves children's scores on measures of health and nutritional well-being. Mother's education influences children's schooling and later earnings more than father's education.[26] Mothers' investment in the nutrition, health, and education of children are critical to the total stock of human resources which any economy can call on for future growth. In their mothering, poor women are the builders of tomorrow's generation--or the progenitors of a new cycle of poverty. Yet poor families are less likely to educate daughters. Throughout the world girls leave school before

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[26] See, for example, Arleen Leibowitz, "Home Investments in Children," in Theodore Schultz, ed., Economics of the Family (Chicago: University of Chicago Press, 1974). She uses U.S. data; the result also holds in Colombia (Birdsall, "A Cost of Siblings: Child Schooling in Urban Colombia," paper presented at 1978 meeting of the Population Association of America, Atlanta, Georgia).

their brothers, often to help their mothers. Poor families foresee for their daughters lives like those of their mothers, with limited opportunities to earn cash income.

The "trickledown" approach applied to women calls for increasing the productivity of men, thus increasing household income, relieving wives of the burden of market work, and assuring more time for childcare. But this is a roundabout, expensive solution for society as a whole, and no solution at all for poor women.

Productivity gains have not spread to typically female work in agriculture, nor to the informal sector which atrracts urban women by reason of its flexible hours. Trickledown via higher husband earnings ignores altogether the growing numbers of women without partners. Poor women enter the workforce to enhance their control over resources and to have a "window on the world"; trickledown cruelly ignores this human aspiration.

Enhancing women's range of choice by assuring equal schooling and more productive jobs <u>is</u> development. It is not attained by increasing the income of men. Poor women work with limited capital and simple methods. Why not concentrate on human technologies to reduce the time women and children spend fetching wood and water and preparing meals? Why not concentrate on providing easily available clean water for rural women, easier credit and better transportation to wholesale markets for urban market women? Saving time <u>is</u> development: Time saved from humdrum tasks is time to invest in human capital development.

To become less poor, women must become more productive. As fertility falls around the developing world, women will have more time for work at home and work for cash income. The potential of that time for development is enormous if women's time can be made more productive.

Now women have fewer tools, less capital, less schooling, and less choice in how to use them than men. Unlocking the potential productivity of women is the challenge of development. The failure up to now to unlock that potential is the reason why poverty <u>is</u> a women's issue. It is further the reason why the poverty of women <u>is</u> a development issue.

What We Do Know About Women in Poverty: Implications for Programs and Policy Development

Nadia H. Youssef

International Center for Research on Women

As the papers presented in this volume make clear, the problems of poverty in the Third World cannot be addressed effectively by policies that do not specifically recognize the role that women play in society and the special burdens that poverty places on them. Policies and programs that have been aimed at men, on the theory that improving the economic status of men will also improve that of women, have been seen not to work, because they do not take into account the fact that in a great many cases either there are no men in a household or they cannot provide for their families by themselves. Women, then, must find a way to bring in income as well as to raise children and take care of the home.

It is equally clear that in order to be effective, policies and programs aimed at women must be concerned not only with meeting their basic needs but also with addressing the underlying causes of their poverty. Policy directed at enhancing/improving the present life of women through meeting their basic human needs is neutral, can be implemented immediately, and should guarantee delivery of social, health, childcare, family planning, and nutritional services to women and their children. Such programs are crucial; however, they do not in and of themselves address the structural issue of poverty. Hence it is imperative that policies also be developed that are geared to providing greater economic opportunities for women. Effective policy measures can and must be

taken to promote projects that produce income for women in poverty by enhancing traditional income-earning activities, providing women with alternative income-generating opportunities and sources of employment, and making accessible to them training, vocational skills, marketing know-how, and credit and cooperative systems.

I emphasize the distinction between these two directions in policy formulation because of the difference in goals between policy planning for welfare concerns (the former) and policy planning based on the "integration-of-women-into-development concerns" (the latter). The former promotes assistance for improving the physical well-being by providing materials and services. The latter necessarily involves policy intervention in the restructuring of social, economic, legal, labor and political relations. The record shows that in the past welfare programs have been directed at women, and economic development programs at men.

Women in developing countries, particularly those who are living in poverty, have been doubly jeopardized by the welfare approach on their behalf. Welfare programs receive but a small proportion of development funds and skilled human resources. In addition, including women's concerns only in welfare-oriented policies excludes women from the broader national development program and policies that would help them to become more productive.[1]

Policy development should not be grounded on the premise that women in poverty are a welfare issue; rather, women should be perceived

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[1]For an excellent discussion of this issue, see Adrienne Germain, "Poor Rural Women: A Policy Perspective", Journal of International Affairs, Vol. 30 (2): 164.

as a source upon which development planners should draw. Programs and policies must be based on maximizing women's strengths, women's development, and women's economic self-sufficiency.

Economists sympathetic to women's concerns counsel us to assert the "cause" by demonstrating empirically that productivity gains/ increases in income can come about by targeting -- within target groups -- women. To many policy makers these are measures of success Such advice is correct. However, the only way to ensure that women's productive value receives recognition by world economists and policy makers is to "allow" women to be productive in the context of the overall economy. And this is why programs and policies must be economically viable, why women must be taught skills that are marketable in the context of the overall economy, and why women must be guaranteed access to cooperative and credit systems.

The continuous concern and responsibility of policy makers should be to view women as independent, capable individuals. The multi-dimensionality of their roles and potential should be the focus of concern, not the overemphasized,one-dimensional view of women as wives and mothers only. Programs and policies must be based on clear knowledge of the economic reality in which women function and not on idealized role and status concepts.[2]

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[2] Ibid, p. 170.

A social fact to be acknowledged by policy makers is that women in poverty at all ages and regardless of their marital condition need to contribute to their own and their children's survival (as well as, often, that of other family members). It is absurd to question whether or not women among the poor should be or are performing dual roles. The fact is that they are, not only in households where there are no men present, but also in intact family situations where male marginality/male low pay makes the women's income necessary. Poor women work because they must. In most countries, anywhere between one third and more than one half of a woman's time is spent in productive activities other than childbearing and homemaking.[3] In some societies women are clearly expected to provide economically for themselves and their children. There is a contradiction between this economic reality and the lack of work/employment opportunities open to women suffering from poverty. Most societies continue to train women primarily for family roles, not for economically active lives, on the assumption that they will be provided for by men.

Women in poverty do not have a choice in the action they take. I state this rather obvious fact for the benefit of non-economists like myself, who may inadvertently be influenced by the economists' choice of words and their abstract mode of analysis. The world view espoused by economists is that men (and women) act out voluntary exchange and rational decision-making on the calculated basis of

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[3]Ester Boserup "Employment of Women in Developing Countries, " in Leon Tabah, ed., Population Growth and Economic Development in the Third World (Liege: USSP, 1976), pp. 82, 104-106.

maximizing or minimizing their opportunities. Behavior is thus seen in terms of making "choices" and effecting "tradeoffs." I have only recently learned that statements to that effect by economists must not be taken literally. The economists' view of the world and their definition of choice is merely a heuristic device which purports to explain substantial variance in behavior at aggregate levels. It does not necessarily reflect reality.

I feel the need to clarify this point, because the element of choice has important implications for policy formulation. A policy maker not aware of the economists' heuristically oriented methodology might react in a way that carries adverse implications for policy to statements that poor women make "choices" and "trade offs" in opting to work, even though working may adversely affect the welfare and nutrition of their children. Not only can such statements evoke the image of a heartless mother but, more importantly, they seem to support the misapprehension that poor women may indeed not have had to choose[4] to go out and work in the first place.

Women in poverty have particular problems in that the incidence of marital disruption and family fragmentation is higher among them than among women in other socioeconomic groups. The proportion of households

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[4]The concept of real "choice" is best exemplified in Dorothy Remy's paper in this volume. Referring to prostitution, she writes that a Kenya official reserved the term prostitute for a woman who is capable of earning income in a legitimate manner, but chooses to earn part or all of her income from the sale of sexual services. In that sense only about 5% of the women who sell sexual services are prostitutes; the other 95% have no other way to earn income.

headed by women continues to grow significantly in the developing world, due to death, desertion, migration, divorce, or male marginality in the home. The economic situation of poor households headed by women is more critical than that of poor households headed by men. Female heads of household are more likely to be unemployed; if they work, they do so in the informal sector and at correspondingly lower wage rates than male heads of household. There are also fewer secondary workers to bring in additional income in households headed by females than in those headed by males, which increases the burden on women heads of household.

These women have to work, but they are at a disadvantage in the labor market. Work opportunities and wage rates for low-income and landless women have deteriorated more than for males. Female labor, especially in agriculture, construction, and other labor-intensive tasks is assumed to be less productive than male labor.[5] In addition, women's traditional productive roles and income-earning activities or opportunities have been displaced as a by-product of the introduction of technology, export-oriented cash crops and trade, and farm mechanization, as has been amply documented. As new technology is introduced into traditionally female activities, men replace women in those jobs, which aggravates the situation of poor women particularly, because it cuts down on the employment opportunities available to them.

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5 In some Asian countries the conversion factor of women-days to man-days is .7 or .8. The ratio for wage rate is usually the same. There appears to be no data on actual productivity differences.

Recommendations for Programs and Policy Development

The above discussion has outlined the realities of the situation of impoverished women that policy makers and planners must take into account in developing programs and policies aimed at encouraging an active role for these women in their countries' economic life. I will now turn to the specific recommendations for such policy development that have emerged from the papers given at the Workshop and from the discussion at the Roundtable.

Recommendations

The basic premise of the recommendations that follow is that it is through the world of work that the lives of poor women will be most affected. Women's productivity must be increased in order to ensure improvement in wages and income. Only then can the poverty cycle be broken.

Clearly such efforts must be made at the local and national levels as well as the international level. It is essential that the less developed countries (LDCs) incorporate explicit policy on women's issues and concerns into their national directives as an intrinsic part of development strategy. It can no longer be assumed, as it has been in the past, that general development programs will benefit both sexes. The inclusion of a separate component to support women's concerns in a country's Five-Year Plan is critical for several reasons:

1) It ensures recognition of the fact that women in the developing countries are relatively worse off than men; that the problems and needs of women are not always the same as those of men; that therefore development-related changes and policies will affect women and men differently; and that up to now the benefits of development have not "trickled down" to women in the same way that they have to men.

2) It provides a guarantee that development policies initiated for women will be planned within the context of national development strategy (as opposed to being small-scale, piecemeal solutions); and will effect nation-wide transformation (as opposed to reaching out only to small groups of women).

3) It provides a means for bringing to the surface what each country aspires to and realistically is able to choose to do for women; more importantly, it shows that women can be contributors to national goals.

4) It provides a structural framework within which it will be possible to demarcate the "legitimacy" of the role that international and bilateral efforts, a donor country, or even a researcher can realistically play with respect to action-oriented research, project implementation, and policy recommendations related to women's concerns in each individual country.

The specific directions policy measures should take are outlined below. Given first are general recommendations, followed by recommendations for programs for women at particular stages in the life cycle.

General Recommendations

1. Job Opportunities

Projects must be promoted that will produce income for women either directly, by creating or supporting income-earning opportunities, or indirectly, by providing training in marketable skills. Suggestions for improving women's market productivity include the following:

a) Increase the productivity of income-generating opportunities already available to women by making them more efficient. In addition, provide ways of guaranteeing that women will derive the profits from their labor.

b) Introduce economic alternatives for women by supporting women's entry into the formal sector of the economy and/or by developing areas of productivity within the traditional market sector.

c) Find ways to utilize existing skills (those used in home production, for example) in the marketplace and public sphere in order to protect against female marginalization.

d) Labor-intensive production should be promoted in the "intermediate" labor market sector, and more capital should be allocated to women or to specific industries (i.e., industrial sewing, tailoring, textiles, food processing) in which women can function, so as to generate more job opportunities.

2. Wages

a) Discrepancies between women's and men's wages must be reduced. Legislation must protect women from having wage improvement operate to their disadvantage, e.g. through employment discrimination.

3. Home Production and Childcare

a) Women's income potential must be increased by redistributing the responsibility of child rearing, which is now totally a woman's chore, so that family and society share in that responsibility.

b) Home production time can be made more effective through basic improvements, such as running water, that would effectively reduce the amount of hours spent in home production, which is of nonmarket value, and channel such a gain in time into childcare (if needed) and/or promotingequilibrium between the duality of domestic/work roles.

4. Cooperatives

Action programs related to enhancing women's productivity and income-earning potential must recognize the significance of women's informal networks and support activities at the community level as a means of mobilizing and distributing scarce resources -- labor, capital, or information. The direct policy goal here would be to promote cooperative-support projects as a mechanism through which the capacity of women in the community can be increased and their resources can be mobilized more effectively.

Specific Recommendations

Up to now, the few policies that have been directed at women have erred in regarding the female population as a cohesive unit. But the needs and abilities of women vary according to their age, to whether or not they have dependent children, and to whether they live in urban or rural areas.

Policy formulation should center around three groups of women: adolescents, women with dependent children, and older women. In rural areas program and policy development must be explicitly directed toward transforming women's home production tasks to the marketplace, supporting cooperative efforts, and providing basic managerial assistance to protect women producers from exploitation. In urban areas, more intensive efforts must be directed through training centers and vocational programs toward expanding the range of job opportunities and income-earning opportunities for women.

Adolescent Females. Formal educational opportunities for female adolescents must be made more accessible, in order to maximize attendance rates.

There must be an increase in nonformal educational programs that teach marketable industrial skills. The ultimate goal of such programs is to prepare young women for eventual employment in productive work. Such programs may have the added effect of delaying marriage or entry into union, and, within marriage or unions, of lessening the

motivation for having many children, as women are exposed to legitimate alternatives to the wife/mothering role. Such alternatives can become particularly attractive to young women when they find the economic activities they are involved in rewarding.

Women 25-40. This is the age span during which single, married, widowed, divorced, separated women are most heavily burdened with dependent children.

Short-term training should be provided to women in this age group which will either draw upon their existing skills or introduce them to new skills, in order to enable them to have access to better jobs in the formal sector or better income-earning opportunities in the informal sector.

Strategies should be devised to expand the range of jobs in both the formal and informal labor sector that are compatible with childrearing activities.

Specific programs and policy considerations should be directed toward promoting childcare services within the community or neighborhood. Such an effort would have the compound effect of releasing the working mother for productive employment outside the home and at the same time providing an income to women in the neighborhood who provide childcare services in their homes. Working mothers would be expected to pay for such services.

The provision of these services for a community could well be centered around the marketplace. Health and daycare services could be provided, along with short-term education and training sessions. The advantage of locating services on such a site is that it would make possible wide participation of women of all ages in countries where women are heavily involved in market activities.

Women 40 and Over. Because their children are older, these women are not as homebound as those in the 25-40 age group. Therefore women over 40 may be able to devote longer hours to work outside the home and travel longer distances to work.

These women should be encouraged to enter into small-scale trade, agro-business, and commercial retail activities. For them, factory work may prove to be particularly advantageous, because a full-time job would not interfere with their family responsibilities. Hence on-the-job training in machine operation should be made available to this age group as well.

Because of the respect given to older people in most traditional societies, older women control informal social networks. Advantage should be taken in policy planning of this cultural trait. Programs for training older women to assume leadership positions could be instituted; they could be trained in managerial skills and given positions of responsibility in cooperatives, for example.

Research and Policy

One question that has arisen out of the process of scrutinizing the Workshop papers and Roundtable discussion for policy implications is that of how policy makers interpret research results. In other words, how does the way in which results are reported or the way in which a study is focused affect the policy maker's process of interpretation and evaluation of research results? Several of the papers presented at the workshop, for example, focus on the effect on children of women's work outside the home; such research, if taken out of context, could reinforce whatever biased attitudes policy makers already have and result in the articulation of policy that would hinder the integration of women into development.

As Arvonne Fraser aptly stated at the Policy Roundtable Conference, "It is about time that discussion of women's concerns and issues went beyond motherhood." True, the vast majority of women do bear children, numerous children. Mothering is not all they do, however. We cannot continue to define women -- and attempt to identify their needs -- on the basis of their capacity for biological reproduction, for the truth is that women perform more roles in society than those of parent and partner. As long as womanhood is equated with motherhood, programs and policies for women will continue to focus on women's roles as reproducers, and confine themselves to providing welfare-oriented services, such as nutrition, health, and family planning. This orientation is at the basis of the notion that investment in women yields low economic returns.

The aura of sentimentality surrounding the motherhood role obscures the reality of women's new economic roles and responsibilities in the Third World. Assisting women to meet these new responsibilities is what has to be defined as a priority in policy development, particularly in dealing with women in poverty. There is therefore a need to perceive women as independent and capable individuals.

Equating womanhood with motherhood has in the past led to a great deal of ambivalence, hesitancy, awkwardness, and often downright immobility insofar as the articulation and implementation of meaningful policy directed at assisting women to survive economically is concerned. On the rare occasions when income generation has been the programmatic focus, the projects have been based on welfare rather than developmental concerns, involving make-work projects that produce unmarketable items and training in skills which are sold at subsidized rates. As a consequence, such programs have not helped women to become economically independent.[6]

Arguments have been made to the effect that encouraging women to take up roles other than those that are home- and child-oriented will diminish family welfare or violate the sanctity of the family. Unless these myths are debunked, efforts to marshal action in support of women's economic needs will continue to be accompanied by feelings of "guilt." This is why studies that conclude that the

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[6] Germain, op. cit., p. 163.

mother's work status is associated with negative effects on the nutritional status of children in rural households, time spent in childcare, and on family welfare generally are dangerous, for policy makers may interpret them as indicating that women should not work outside the home. It must be made clear that such analyses are indications of problems that must be considered in developing programs and policies for impoverished women, who -- in most cases -- have no choice but to work.

Any policy affecting women will bring about altered relations within the family; work outside the home will have some impact upon children. But it is important to remember that it is not policies for women per se but the consequences of development that have caused severe disintegration and dislocation in traditional family structure, as authority patterns, marital stability, and male economic responsibilities become severely threatened.

Overemphasis on the value of nonmarket production, particularly when such activities are equated with productive value derived from market activities, could also lead to decisions which would undercut the importance of policy development directed to enhancing women's income-earning opportunities. Demands for the integration of women into development have in the past been based on recognition of the fact that women contribute to development in different ways. The more recent trend, (quite pervasive in the Workshop papers) is to advocate the cause by emphasizing the value of women's home (nonmarket) activities. Economists now argue for the need to impute productive value to women's traditional activities (motherhood, childcare, health care, nurturance) because, though not

monetized, such activities enhance the welfare of society, provide support mechanisms, meet need-satisfactions, and have a direct bearing on human capital formation. There is a danger in extolling the virtues of traditional home production, however, for this attitude may inadvertently reinforce traditional views of appropriate activities for women and reduce the accepted range of women's legitimate activities to purely supportive roles. The crucial question as to precisely what costs and benefits accrue to women when they extend such supportive services to their husbands and sons and society at large will never be considered.

Women are and always have been producers, both in the home and at work. Women in poverty are not in need of a romanticized version of home tasks, they are in need of gaining access to ways and means through which they can engage in economically productive (i.e., marketable) activities. There is compelling evidence that intrafamilial labor deployment by sex in households is conditioned not by differences in men's and women's skills, but by the purpose and scale of each economic activity. Women generally are in charge of use-value and men of exchange-value production, but there is no reason why the efforts, skills, and talents displayed by women in the multitude of economic activities they pursue for the household cannot be transferred to the market and put to use in exchange-value production. Such a transfer will serve the real economic needs of women. It will also facilitate, I believe, a social dialogue on the redistribution of the work load in the home and on the substitutability of tasks in central (sex/age) terms, and will provide support for improvements in home technology.

II. WOMEN IN POVERTY: WHAT DO WE KNOW?

CHAPTER 1: WOMEN AND WORK

Time Allocation and Home Production in Philippine Rural Households

Elizabeth K. Quizon
and
Robert E. Evenson
Yale University

Home production, home management, and home technology have, until recently, been the concern of only home economists even though the concept involved in the study of such subjects are not alien to general economics; agricultural economists, for instance, focus extensively on farm production, farm management, and farm technology. The neglect of home production is primarily the consequence of the development of the conventional theory of consumption and the emphasis on market activity by economists in general. In recent years, however, economists have rediscovered home production, and a modern body of theoretical and empirical work on households is being developed. Related efforts, of which this paper is one, are being made to adapt the general body of modern household economic theory to the low-income rural household setting.

Using data from a survey of rural households in Laguna, Philippines, this paper analyzes the factors that determine time allocation in such households. This analysis is the basis for a discussion of the value of home production and of the need to include that value in any estimates of the full income of rural households. If the value of household production is added to market income in determining full income, the importance of the nonmarket production of women in rural households becomes clear.

The basic household economics model used in this study assumes that the household maximizes a utility function which has as components more basic commodities called "consumables," produced by combining market goods and time.[1] That relationship which shows the transformation of goods into "consumables" is the household production function. Because time is an input into nonmarket production and leisure as well as into market production, it becomes a constraint to the maximization of household welfare. Besides allocating time among alternative uses, households also allocate their time resources among members, resulting in activity roles within the household. Changes in the price of time would then induce not only a substitution between goods and time inputs in the production process, but also a substitution between husband's time and wife's time in different activities. Using this basic framework of analysis, the supply of time to the market and to the home become interrelated household decisions, simultaneously made, and dependent on market wages, productivity of time, tastes, and other characteristics of the household.

The data used in this study were gathered through a multi-purpose survey of rural households in the Philippine province of Laguna. Two sets of time data were generated by the survey. The "recall" data were collected in the initial phase of the project. Respondents were asked to recall how much time was spent on particular activities in the past week, for nonseasonal activities, and over a longer period for seasonal activities. Leisure time is calculated as a residual. The "observation" data were collected by direct observation of the households in three separate 24-hour visits over an eight-month period. Recording of time allocation was done in great detail, with more than forty activities specified. Leisure was measured directly, and joint activities, such as

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[1] For a full description and discussion of the model, see Appendix 1.

food preparation and child care, were recorded as separate activities; therefore, the observation data may actually sum to more than 24 hours per day.[2]

Patterns of Time Allocation

There are a great number of different activities in a day. The Laguna survey divided daily activities into classifications (see table 1), which for this study have been aggregated into three broad categories: market production, home production, and leisure.

"Market production" includes various types of work, such as wage employment, practice of profession, business, farming, and other income-earning activities. On the average, fathers in the Laguna sample households spend about 7 hours a day in market production, and mothers about 2½ hours.

The activities comprising work at home are difficult to identify. One problem is that the product of income-earning home production time may not be entirely offered in the market, making it difficult to separate the home production time component from the market work component. A second difficulty, which stems from the fact that time is itself a direct source of utility as well as a productive resource, is

[2] The total recorded time may also be less than 24 hours per day, depending on whether time spent outside the home was fully reported. No time component was calculated as a residual in the observation data.

For a comparison of observation and recall data, see Appendix 2.

Table 1. Time Budgets in Laguna Rural Households (hours per day)

Activities	Father	Mother	Children[a]
Economic Production	6.86	2.55	5.56
Wage employment	1.91	0.56	1.17
Profession	0.35	0.14	0.11
Business	0.45	0.44	0.50
Pre-harvest	1.32	0.28	1.10
Post-harvest	0.58	0.27	0.54
Coconut production	0.54	0.16	0.62
Sugar cane production	0.02	0.00	0.02
Vegetable production	0.15	0.11	0.24
Home Gardening	0.07	0.03	0.05
Livestock raising	0.70	0.28	0.57
Handicraft	0.02	0.13	0.05
Marketing	0.08	0.05	0.05
Fishing	0.25	0.01	0.22
Repair	0.16	0.03	0.02
Travel	0.25	0.08	0.18
Hunting	0.00	0.00	0.12
Others	0.00	0.00	0.00
Home Production	1.29	7.44	13.36
Cooking	0.41	2.06	0.84
Breast-feeding	-	0.36	-
Bottle feeding	0.01	0.01	0.01
Caring of children	0.38	1.69	0.44
Marketing & travel	0.10	0.39	0.31
Fetching or chopping	0.13	0.07	0.20
Household chores	0.22	2.76	1.71
Story-telling	0.01	0.003	0.07
Care of aged & sick	0.004	0.04	0.00
School or class	0.04	0.04	9.77
Leisure	13.56	14.00	54.75
Sleeping	7.89	8.64	34.63
Eating	0.59	0.67	2.85
Playing with children	0.02	0.04	0.45
Passive recreation	4.22	3.77	12.77
Active recreation	0.01	0.00	1.39
Being sick or immobile	0.08	0.10	0.34
Church activities	0.02	0.09	0.19
Festival activities	0.77	0.60	1.99
Social Service utilization	0.07	0.08	0.24
Others	0.00	0.00	0.00

[a]The average number of children in the sample households is 4.

that certain home activities, such as childcare, can be considered either as work or as leisure. For our purposes, home production is simply defined as

> those activities which are carried on, by and for the members, which activities might be replaced by market goods, or paid services, if circumstances such as income, market conditions, and personal inclinations permit the service being delegated to someone outside the household group (Reid, 1934).

In the Laguna rural households, the average mother allocates 7½ hours a day for home production, while the average father devotes less than 1½ hours to the home. Childcare and food preparation are the two most important home activities of the mother.

The third major activity group is leisure, which includes time for personal care (sleeping and eating), active and passive recreation, church activities and festivals, and other activities. According to the data, the leisure hours of father and mother consist chiefly of time spent for personal care--8½ hours for fathers and over 9 hours for mothers. Passive recreation (leisure activities that do not require much physical effort) accounts for 3 to 4 hours of each parent's day. Very little or no time is devoted to any form of active sports. The data show that men spend more time on social activities--attending weddings, town fiestas, etc.--than women. Women, on the other hand, allocate more time than men for church activities.

On the whole, the average household allocates about 15 hours a day to market production and less than 12 hours to home production. More than 3 hours are spent on childcare, slightly less on food preparation, and about 7 hours on other household tasks. The father's market time

alone accounts for 46 per cent of the family's total market production time, indicating that he is the primary breadwinner. The mother's chief contribution to household production is her nonincome-earning work at home, which is 57 per cent of total home production time.

Children do participate in both market and home production. It is interesting to note the importance of children in crop cultivation, livestock raising, and fishing. The market work time of children, which is, on the average, more than 30 per cent of the total for the family, exceeds the mother's; and their home production time, also 30 per cent of the family total, is greater than the father's, although it should be noted that time at school is included in home production time. Children in these rural households do, then, play a significant role as producers, both in the market as well as in the home.

Determinants of Time Allocation

Every household is unique, and each therefore is expected to exhibit its own pattern of time allocation. Comparisons of time use between farmers and nonfarmers, between big households and small, between employed and unemployed individuals, etc., can, however, reveal some underlying determinants of time allocation behavior.

1. Occupation. Occupation affects time allocation as is shown in table 2. In the total sample, more than 40 per cent of the fathers and about 5 per cent of the mothers are farmers--that is, they report farming to be their primary occupation (including fishing or livestock raising); and more than 50 per cent of the fathers and about 30 per cent

Table 2. Time Allocation of Fathers and Mothers in Laguna Households by Occupation Group (hours per day)

Activity	Father		Mother	
	Farmer	Non-Farmer	Farmer	Non-Farmer
Market Production	7.50	7.56	4.61	3.92
Wage employment	1.06	5.02***	1.10	2.19***
Farming	5.17	0 97***	3.36	0.01***
Livestock raising	0.59	.44*	0.02	0.32
Others	0.69	1.21**	0.13	0.34
Home Production	1.00	1.21*	4.34	6.06**
Child care	0.26	0.37	0.79	1.64***
Food preparation	0.34	0.32	1.74	1.76
Others	0.41	0.45	1.80	2.66*
Leisure	14.60	13.42***	14.95	14.02
Personal care	9.75	9.20	11.58	10.37*
Recreation	4.21	3.64*	2.93	2.98
Others	0.64	0.58	0.88	0.67

*** Difference between means is significant at the 1% level.
** Difference between means is significant at the 5% level.
* Difference between means is significant at the 10% level.

of the mothers are nonfarmers--hired farm laborers, factory workers, government or private enterprise employees, annual workers, entrepreneurs, and others. Most nonfarmers do not have second jobs, whereas many farmers do report second occupations. This is not surprising, since individuals who have jobs with less rigid working hours or with more seasonal variation would be able to, and perhaps would be compelled to, supplement their incomes. Many women do not claim an occupation.

The total market production time of both farmer fathers and nonfarmer fathers is about 7½ hours a day; there is no significant difference between them. That of farmer mothers, however, is greater than that of nonfarmer mothers. As expected, nonfarmer fathers devote more time to wage employment than do farmers, who spend more hours on farming activities. Some degree of diversification in the economic activities of all fathers is evident: nonfarmers do spend a few hours on farming and livestock raising, and farmers also earn income from wage employment and other market production. Farmer mothers, as would be expected, have more farm time than nonfarmer mothers, who, in turn, spend more time in wage employment.

Farmer fathers allocate less time for home production than do nonfarmer fathers. Nonfarmer mothers spend about 2 hours more on home production than do farm mothers, particularly on childcare and other home chores; however, they both spend about the same amount of time on food preparation. Farmer fathers have about 5 hours of recreation in a day, compared with about 4 hours for nonfarmers. Although the difference in the mean time spent for recreation by mothers is not significant, farmer mothers do enjoy greater total leisure hours.

2. Time spent on market work. The time budgets of employed fathers and mothers in table 3, grouped according to their hours of employment, give interesting results. Fathers who allocate fewer hours to work in the market devote significantly more time to childcare, food preparation, and other home chores (although the time they spend in work at home--2½ hours--is still significantly less than the time spent--7½ hours--by women with the same degree of market participation). They also enjoy more leisure hours--more time for personal care, for recreation, and other forms of leisure. The general pattern observed is that fathers with only a couple of hours of market work have more home time and more leisure than those with 4 to 6 hours of market production, and the latter have more home time and leisure than fathers who work more than 6 hours. It may be noted, in particular, that only when market production time averages more than 10 hours a day do fathers reduce greatly their time for children and for other household tasks. Moreover, their time for personal care and recreation is also drastically cut down.

The time allocation of mothers is very similar to that of fathers. In general, women who are active in the market for only a few hours a day can still devote time to home production and to leisure, but that time is reduced as market production rises. Only when market time exceeds 6 hours do mothers reduce their food preparation time. This implies that labor force participation of women per se need not result in a decrease in time spent for essential home production activities. Rather, such time is determined by the degree of market participation or the quantity

Table 3. Time Allocation of Fathers and Mothers in Laguna Households, by Work Status (hours per day)

Activity	Father, by hours of work				Mother, by hours of work			
	0	-4	4-6	6/	0	-4	4-6	6/
Market-Production	0.00	1.80	4.99	10.62***	0.00	1.30	5.21	8.93***
Wage employment	0.00	0.26	0.69	5.06***	0.00	0.34	1.77	4.90***
Farming	0.00	0.68	2.62	3.84***	0.00	0.32	1.46	2.48***
Livestock raising	0.00	0.35	1.08	0.47**	0.00	0,27	0.94	0.22**
Others	0.00	0.42	0.60	1.25***	0.00	0.37	1.04	1.32**
Home Production	1.90	2.41	1.98	0.65***	8.38	7.62	5.15	3.30***
Child care	0.13	0.63	0.72	0.19***	2.72	2.02	0.84	0.68***
Food preparation	0.31	0.88	0.47	0.16*	2.00	2.10	2.17	1.30***
Others	1.46	0.90	0.78	0.29***	3.65	3.51	2.15	1.32***
Leisure	21.51	19.15	16.52	12.72***	15.64	15.21	13.37	11.82***
Personal care	13.24	11.43	10.39	9.38***	11.15	10.35	10.16	9.76**
Recreation	5.85	6.34	5.68	3.02***	3.71	4.02	3.09	1.80***
Others	2.41	1.38	0.44	0.32**	0.78	0.84	0.12	0.26

*** Difference between means is significant at the 1% level.
** Difference between means is significant at the 5% level.
* Difference between means is significant at the 10% level.

of labor supplied to the market. When the labor market structure allows flexibility in the number of working hours, such as is the case in the informal business sector and agriculture, labor force participation does not necessarily imply a decline in the role of these women at home. The findings here also suggest that, since active market participation can cut deeply into home production time, "full" income rather than cash income would be a better measure of household welfare.

3. Children. One factor which is known to greatly affect the time allocation of married persons is the presence and number of children in the household (Gronau, 1976a; Boulier, 1974). The sample households in this study have an average of four children. Table 4 shows a comparison of time budgets for households according to the number of children.

Apparently, the number of children does not materially affect the fathers' total market production or total home production time. On the other hand, the market production time of mothers in larger households is greater than in smaller households. Furthermore, fathers and mothers with more children spend less time on their children than other parents, and enjoy more leisure time. This result is not surprising, as larger households will probably have older children who can substitute for the parents' childcare time.

More important, perhaps, than the size of the family are the ages of the children, because infants and pre-schoolers will need more parental attention and care than older children. Table 4 shows that having an

Table 4. Time Allocation of Fathers and Mothers in Laguna Households by Number of Children at Home (Hours per day)

Activity	Father				Mother			
							Without infants	With infants
Market Production	6.66	6.12	6.20	2.30	2.16	3.45**	2.96	2.10**
Wage employment	2.33	2.52	2.68	1.08	0.91	1.78	1.35	1.06
Farming	2.78	2.54	1.91	0.53	0.64	0.83	0.79	0.59
Livestock raising	0.33	0.41	0.42	0.22	0.16	0.34	0.28	0.10
Others	1.22	0.65	0.98	0.46	0.45	0.60	0.54	0.35
Home Production	1.33	1.12	1.17	7.44	6.30	5.63**	5.93	8.97***
Child care	0.88	0.27	0.16**	2.10	2.04	1.26**	1.04	3.96***
Food preparation	0.55	0.38	0.26	1.95	1.71	1.71	1.92	1.89
Others	1.45	0.61	0.71	3.39	2.54	2.66	2.97	3.12
Leisure	14.33	14.96	17.10**	14.26	15.51	14.93*	14.32	13.00***
Personal care	8.97	11.50	12.06**	9.73	12.46	10.74**	10.38	10.70
Recreation	5.23	3.10	4.32*	4.10	2.64	3.52	3.83	2.30***
Others	0.13	0.36	0.72*	0.43	0.41	0.67	0.11	0.0 **

*** Difference between means is significant at the 1% level.
** Difference between means is significant at the 5% level.
* Difference between means is significant at the 10% level.

infant significantly decreases the mother's market and leisure time and increases home production time.

Econometric Analyses of Time Allocation

The discussion of time allocation in the previous section provides a number of testable implications for empirical analysis. In this section we develop these in further detail and report findings for two subsets of the Laguna data.

The model we have used in this study (see Appendix 1) is subject to certain implicit and explicit restrictions. For example, we have assumed that the wife can simply substitute for the husband's home time in a two-person household. We have also assumed that the wife can substitute her farm time for the husband's farm time. In the case of job costs we suppose simple fixed costs which do not depend on the hours worked.

A number of testable implications are directly related to these restrictive assumptions and this should be clearly recognized. A change in these assumptions would yield different implications. It seems most reasonable, however, given the current state of the art, to start with a relatively simple and restricted model and submit it to the evidence. We can then proceed in future modelling development to be guided by whether the evidence rejects the present model.

The Husband's Market Wage

When the husband's wage increases, the price of leisure rises, inducing a substitution of market time for leisure. It also produces an income effect which runs in the opposite direction. More leisure is desired when income rises. The increase in income has no effect, of course, unless the husband is working in the market (or is induced to enter by the increase). We generally expect the substitution effect to dominate the income effect; thus an increase in the husband s wage will induce him to work more hours in the market. He will also work less in the home, unless he is already fully specialized in the market. If he has the option of farm work, he will work fewer hours in the farm (and the home), and this displacement of time will result in a larger market time effect.

The husband's wage rate will also affect the wife's time, although this will primarily be an income effect for her, unless there is agreement on leisure sharing. With equitable leisure sharing, the wife will reduce her leisure, even though she does not have a substitution effect per se. It should not affect her home time at all if she is in the market.

In table 5, the effect of the husband's wage rate is as expected on the husband's time allocation. The effect on the wife's time allocation is similar and suggests that leisure is "shared." The regressions in table 6 also support the expectations regarding an increase in market time of the husband and a decrease in farm time. The husband's home time effects are not expected to be significant. The evidence in table 6, however, has little to suggest regarding the wife and the sharing of leisure.

Table 5. Regression Analysis of Laguna Observation Time Allocation Data

Independent variables	Wife		Husband	
	Home time	Market time	Home time	Market time
Constant	363.20	196.63	88.06	266.06
Wife's market wage	-3.53 (3.72)	6.16 (3.69)	-0.28 (7.00)	4.76 (5.41)
Husband's market wage	-27.22 (10.80)	13.01 (10.66)	-5.10 (0.74)	26.69 (11.55)
Home capital	29.35 (10.91)		-9.18 (5.58)	
House	-2.90 (1.87)		1.56 (1.01)	
Farm capital		2.39 (2.08)		7.31 (2.86)
Children 0-1	186.77 (30.72)	-37.43 (30.43)	27.35 (16.58)	-7.16 (44.75)
Children 1-6	37.18 (14.03)	-3.68 (13.63)	-1.05 (7.50	12.47 (20.44)
Children 7-15	-5.47 (9.77)	9.03 (10.33)	-6.96 (5.27)	18.97 (14.82)
Children 16+	12.60 (16.15)	-8.90 (16.18)	5.85 (8.01)	-14.78 (21.42)
Education of wife	-4.19 (9.52)	16.82 (8.99)	7.51 (5.04)	4.76 (5.41)
Education of husband	-6.46 (8.18)	2.50 (8.06)	5.56 (4.38)	-14.29 (13.23)
Wife's age	10.78 (7.76)	-13.42 (7.80)		
Wife's age^2	-0.24 (0.12)	0.26 (0.12)		
Husband's age			3.32 (3.65)	0.82 (10.25)
Husband's age^2			-0.07 (0.06)	-0.03 (0.14
Wet season	-8.13 (27.10)	20.78 (26.99)	-30.67 (14.54)	14.60 (39.46)
Cool season	-5.03 (31.44)	-5.17 (30.41)	-19.84 (16.53)	16.34 (45.39)
R^2	0.320	0.118	0.113	0.108
No. of cases	291	291	291	291

Standard errors in parentheses.

Table 6. Regression Analysis of Laguna Resurvey Recall Time Allocation Data

Independent Variables	Non-farming Households (101)				Farming Households (124)					
	Wife		Husband		Wife			Husband		
	Home time	Market time	Home time	Market time	Home time	Farm time	Market time	Home time	Farm time	Market time
Non-wage Income	-.00004	.00006	.00084	-.00004^{xx}	.098^{x}	.014	.045^{x}	-.002	-.009	.012
Wife's Market Wage	-1.085^{x}	.983^{xx}	-.474^{x}	-.796^{x}	-.32	-.76	.708^{xx}	-.014	.155	.035
Husband's Market Wage	.091	.015	.007	.336^{xx}	.275	-.56	.069	-.014	-.336^{xx}	1.01^{xx}
Home Capital	.0018	.0018	.0004	-.0003^{x}	.00025	.0005	.00005	-.00005	.0005^{xx}	-.0001
Farm Capital					.0005	.0003^{x}	-.0003^{x}	-.0005^{xx}	-.0004	-.58^{x}
Farm Replacement Wage - Wife					.0276^{xx}	.0063^{xx}	-.060^{x}	.002	.002	.0046
Farm Replacement Wage - Husband					.020	-.0002	-.0098^{x}	-.0004	.084	-.002
Cost of Market Job		.208		3.17^{xx}			.049			.009
Children 0-3	-2.99	-4.53	3.19	-2.61	6.16	-1.48	-3.55^{x}	.98	.30	-4.22
Children 3-6	1.67	-2.05	.009	1.37	7.19^{x}	1.98	-1.36	-.28	2.55	.34
Children 6-9	-2.65	4.16^{x}	-.25	5.36^{x}	-4.04	-.10	4.82^{xx}	.13	-1.31	.31
Children 9+	-5.40^{xx}	1.43	-1.14	-.61	-.55	-.08	.27	-.22	-.94	.78
Education of Wife	-.25	.16	-.67^{xx}	.27	.42	-.46	.085	.27^{x}	-.30	.21
Education of Husband	-.66	-.20	.54^{xx}	.56^{xx}	-1.53^{xx}	.52	.031	-.093	.23	.61^{xx}
Year Married	.61^{xx}	.15	-.016	.29^{x}	.51^{x}	.80	.05	.13	.36	.21
Days Sick	.339	-.03	-.011	-.033	-.607	-.282	-.20	.38^{xx}	.067	-.07

The Wife's Market Wage

A change in the wife's market wage has no effect unless she is actually working in the market (or would be induced to work by the wage income). If she is working, there will be income and substitution effects, with the substitution effect probably dominating. She will also displace home and farm time, so that there will almost certainly be a positive effect on market time and a negative effect on home and farm time. The effect on the husband will depend on the sharing of leisure.

Table 5 shows that an increase in the wife's wage does reduce her own home time and increase her market time. It has a possible positive effect on her husband's market time, thus supporting the leisure-sharing hypothesis. The table 6 results also show strong positive effects on the wife's market time and negative effects on her home and farm time. The effect on the husband's time is ambiguous and does not provide strong support for leisure sharing. In fact, in the nonfarming households, it appears that leisure is not shared.

Farm-replacement Wages

For farm households, farm-replacement wages reflect the alternative costs of farm time and would be expected to predict time allocation. In particular, they should be positively associated with farm and home time, and negatively associated with market time, because high farm productivity will lead to a displacement against market time. Table 6 provides evidence that in farm households the wife's replacement wage does induce more farm and home time and less market time for her. The husband's replacement wage effect is somewhat weaker.

Cost of Market Jobs

The theory predicts that when job costs are high, substantial market work will be undertaken. A rise in job costs will thus induce more market work. Table 6 provides support for this proposition.

Farm and Home Capital

An increase in home capital should raise the productivity of home work and thus increase home work and decrease farm and market work for the wife. The effect on the husband should be to induce market work. Tables 5 and 6 both provide support for this expectation.

Similarly, an increase in farm capital should lead to an increase in farm work and a decrease in market work and home time for both husband and wife. Again, there is some support for this in both tables 5 and 6 (except for the farm time of husbands in table 6).

Nonwage Income

The effect of an increase in nonwage income depends on whether the husband and wife work in the market. Increased income shifts the "combined" curve (see Appendix 1, figure 2, panels C and D) upward. If both husband and wife work in the market, both will reduce market time because of a pure income effect. Since leisure is a normal good, both will opt for more. If the wife is not in the market but the husband is, the wife will reduce home time. The effect will be somewhat less than in the first case, however, because her marginal product will rise somewhat. The effect on farm time will be similar. When neither husband nor wife works in the market, negative effects on both home and farm time for each are predicted.

We did not explore this effect in the first survey, but table 6 reports some results. The expected negative effect is borne out rather poorly. It is statistically significant for only the husband's market time in nonfarming households and has the wrong sign in some of the regressions.

Education

The effect of education when wages are held constant is difficult to predict, since wages presumably are picking up the effects of skills to some extent. We might expect it to induce more market work because of taste factors. This seems to hold for the husband in Table 6 and for the wife in Table 5, but our results are not very information on this score.

The effect of children in the household can be thought of as having three components:

a) a household life-cycle effect;

b) a goods effect (child services are relatively home-time-intensive goods);

c) a work effect (children's time can be employed in home and market production).

The life-cycle effect is associated with the timing of the other two effects. Consider the early life cycle, during which children are present but contribute little to home production. This has the effect of raising the home production curve because children are home-time-intensive. And, because they are intensive in the mother's time, the addition of children at this stage is similar to the case of an increase in the productivity of the mother's home time as analyzed above.

Now consider a middle life-cycle stage, where the household has both younger children and older children. Here we have two effects. One is the effect of increased home production just discussed. The other is associated with the addition to the model of children as workers. Without developing a further formal analysis, it can be readily seen that the addition of children as workers is roughly equivalent to the addition of a second person. Just as the wife displaced her husband's home production time to make possible gains from specialization, older children will replace the home production time of the wife, at least in certain tasks. At a later stage in the life cycle, when only older children are present, the specialization effects will dominate. These effects are generally borne out in both sets of data.

The analysis made here is quite modest in terms of the statistical properties of the regression results. Nonetheless, support for the model is provided.

The Value of Home Production and Full Income

Conventional household income can be measured in two equivalent ways. It can be measured as the payment to nonlabor assets held by a household plus the payments to household members for work performed. It can also be measured in terms of expenditures on consumption and investment goods. The modern household concept of full income may be similarly measured. However, it differs from the conventional concept in its definition of productive resources and of goods. Full income, measured in terms of payments to productive resources, includes payments to nonlabor earning assets, payments for work associated with the production of market goods

(which includes farm production work, wage employment, and so on), plus the value of time devoted to home production as well as the value contributed to home production by home capital. Full income, measured by expenditures, is the sum of expenditures on household or home goods plus expenditures on investment goods.

Little has been done to actually estimate the value of home production, which involves several problems. First, classifying most home activities as work-oriented or consumer-oriented presents problems because of the pervasiveness of joint production, time being itself a source of utility as well as a productive resource. However, perhaps the more serious problem is that of assigning a money value to the output. On the one hand, they can be valued at the prices for which similar items can be bought from the market. On the other hand, they can be valued based on the production costs of home goods and services to the household. The weakness of the first approach is that household goods which are not generally traded in markets do not have market prices. Instead they have "shadow prices," which can be imputed and which can be defined as the costs of production of household goods. The implicit assumption of a constant marginal product of home time when using "shadow prices" and the difficulty of assigning prices to other inputs of home production are the limitations of the second approach.

The dilemma regarding the valuation of home time can be illustrated by looking at Panel D in Appendix 1 figure 1. In the presence of fixed job costs, if the indifference curve is u_2, home production will have an average product in excess of the observed wage rate (the slope of db'). But if u_1 is the indifference curve, then the average product of home

production is not necessarily higher than the wage rate. In situations where there are job costs (or where home production has a leisure component) and work in the market is not undertaken, the wage rate does not necessarily understate the average product or value of home production time. When actual market work is undertaken by both husband and wife, we can say that the wage rate probably undervalues home production time. The case where it might not is a situation where a nutrition effect exists, that is, where the amount of home goods produced affects the ability to work. In cases where the wife does not work in the market, one cannot say that the wage which she might be able to earn understates the value of her home production. Gronau (1976a) has developed a method for using home production time allocation regressions similar to those reported in table 5 to estimate the average product of home time.[3]

The Laguna data afford an opportunity to value home production and thus full income. Gronau's methodology was used to obtain the estimates of the value value of home production summarized in table 7. The estimates are based on home time allocation regression estimates for employee fathers, mothers, and children, which, while not reported here, were quite comparable to the table 5 results. It might also be noted that the estimates in table 7 are quite similar to those computed simply by multiplying home time by wage rates.

The results are of considerable interest. They show that home production is indeed quite important. They show that farming households have

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[3] Gronau estimated the marginal productivity function of employed and non-employed women. Integrating this yields the value of home production:

$$X_H = f(H) \int_o^H f'(y)dy = \int_o^H (\alpha_o - \alpha_{1y} + \alpha_z Z)\, dy.$$

Table 7. Estimated Value of Home Production in Laguna Rural Households, by Types of Households
(Pesos per year)

Type of Household	Father	Mother	Children*	Total
Farm	631	3342	2820	6793
Nonfarm	710	3280	1757	5947
Mother Employed	396	3067	2275	5738
0 - 3 children	460	3274	1009	4742
4 - 6 children	354	2833	3057	6244
7 + children	288	2967	4869	8124
Mother Not Employed	661	3954	1217	5832
0 - 3 children	788	3874	541	5203
4 -6 children	511	3862	1481	5855
7 + children	783	4169	4658	9610
Mother Employed	396	3067	2275	5738
with infant	630	4864	845	6339
without infant	331	2554	2038	5523
Mother Not Employed	661	3954	1217	5832
with infant	884	5368	1381	7633
without infant	578	3359	1162	5099
Mother's education				
0 - 6 years	463	3338	2212	6014
7 + years	507	2955	1062	4524

* Excluding the value of school time.

somewhat higher home production than nonfarming households, and that home production is higher in households where the mother is not employed and in households with a greater number of children. It might be noted, however, from table 8, that when the market income of the mother is added to the value of home production, the result is that full income in households where mothers are employed is 16 per cent higher than in households where mothers are not employed. Another important feature of the results is the impact of children on the value of home production, which reflects the value of children both as consumers and producers. Indeed, estimating the full income for these households shows a dramatically different picture of the role of mothers and of children from that portrayed by conventional market income measures. The mother contributes only 20 per cent of market income, but her contribution to full income is over 40 per cent. Children in these households contribute about 22 per cent of market income and 23 per cent of full income, if school time is not regarded as productive. Under the more reasonable definition of school time as a form of home production, the contribution to full income of children rises to over 30 per cent. The father contributes 57 per cent of market income but only 34 per cent of full income.

The Role of Women

The focus on full income as a modern household measure of income has shown that home production should not be disregarded in the study of economic activities, for it is in the household that critical decisions regarding marriage; fertility; investments in human capital, such as

Table 8. Value of Market Production, Home Production and Full Income Based on Phase II data from Laguna, Philippines, regression estima

	Pesos per year
Market income	
Father	3334
Mother	1148
Children	1301
Total	5783
Value of home production	
Father	668
Mother	3287
Children (excluding school time)	2061
Total	6016
Children (including school time)	3599
Total (including school time)	7554
Full income	
Father	4002
Mother	4435
Children excluding school time	3362
Total	11799
Children including school time	4900
Total	13337

nutrition, health care, schooling; and labor force participation are still made. The importance given to time allocation within the household is, furthermore, well based. For poor households, time represents the dominant household resource. It will be allocated to several activities in such a way as to minimize the cost of producing household goods.

With this view of time, the modern household economics recognizes that the nonmarket time of women can hardly be described as "leisure." Inducing women to increase work outside the home does not, therefore, necessarily mean reducing their leisure or minimizing their idleness. Indeed, the importance of nonmarket production of women, especially in developing countries, cannot be overemphasized.

Table 9 compares the time budgets of women in six countries. Roughly, it shows that in terms of number of hours spent on income-earning and home activities, Asian women appear to be more "hardworking." Not only do rural Filipino and Javanese women spend more time per day working at home, they also spend more hours in market production. The Bangladesh women report more than 9 hours of home production. That Asian women spend more hours for home production may be explained partly by the greater number of children in Asian households, and partly by the absence of labor-saving home capital in their homes. That they spend more time for market work, on the other hand, may be attributed to the availability of low-paying part-time and seasonal jobs on the farm and in their own backyards.

Table 9. Cross-Country Comparison of Time Budgets
(Hours Per Day)

A. WOMEN

Countries	Market Time	Home Production Time	Leisure	Number of Observations
Laguna, Philippines (1975)				
Total	2.55	7.44	13.99	291
Employed	3.54	6.86	17.01	211
Not employed	0	8.95	15.09	80
U.S. (1974)				
Total	1.76	4.31	17.93	1990
Employed	3.44	3.52	17.05	1022
Not employed	-	5.14	18.86	968
Israel (1968)				
Total	1.60	6.19	15.64	791
Employed	4.30	4.40	14.87	281
Not employed	0.11	7.18	16.06	510
Bangladesh (1974)				
Total	1.68	9.22	13.14	700
Java (1972-73)				
Employed	5.83	5.42		28

B. MEN

Laguna, Philippines (1975)				
Total	6.86	1.29	13.67	291
Employed	7.70	1.41	14.54	257
Not employed	0	1.15	21.41	34
Bangladesh (1974)				
Total	9.02	1.14	13.83	700
Java (1972-73)				
Employed	7.99	0.85	-	25

Table 9 cont'd

Sources: The different time data used are the following:

The time data of U.S. and Israeli married women are taken from Gronau (1976 a and b). In the Israeli survey conducted by the Institute of Social Research, the interviewees were asked how they spent each hour of the previous day with 48 different activities identified. The U.S. data are taken from the Michigan Study on Income Dynamics (1968-1974). The head of the household was asked about the number of weeks he and his wife worked in the market in the previous year and the number of hours worked per week. Also, he was asked the number of hours he and his wife spent on housework in an average week. The reported annual hours devoted to home work may underestimate the real extent of home production because it is not clear whether the respondents included activities like shopping or child care in their replies about home time. Leisure was calculated as a residual. To make the U.S. annual data comparable with the Israeli and the Philippine data, the number of hours in any of the three activity divisions were divided by 365 days.

The Bangladesh survey was conducted over seven Unions throughout the count representing modern and traditional urban and rural situations. The time data collected refer to the respondent's use of time on the day before the interview. To allow comparison with other time data, the Bangladesh activity groups were aggregated as follows: cash-earning work and self-employed income-earning time were added and labelled as market production, expenditure-saving household work time (such as going to market, washing clothes, cooking, cleaning the house, teaching one's children, etc.), time spent for study and training and time for unpaid but necessary work were summed up under household production time; personal care (which refers to "time used for toilet, eating, bathing including some rest before and after meals") and sleeping time (which is defined as a residual item) together make up personal care (or Gronau's physiological needs) time; and finally, time for recreation, religious work and unused time (which includes "sitting idle" or "moving about aimlessly") comprise the recreation category.

White's (1976) data on Java were collected in 1972-1973 from the village of Kali Loro (in south central Java) based on a sample of 20 households containing 104 individuals which were visited for 60 days per household per year. Annual time data for 50 females and 54 males from ages 6 to 50+ years were obtained. No clear distinction regarding civil status was made. For the purpose of the comparison, the daily average time budgets of men and women aged 20 to 50+ years were estimated from the average annual time. Market production time is the sum of hours spent for handicrafts, preparation for food sale, animal care or feeding, trading, agricultural wage labor, and non-agricultural wage labor. The components of home time are number of hours for child care, housework, food preparation, firewood collection, and shopping

Policy Implications

Rural development policies have stressed improvements in farm technology and the dissemination of better farm practices. Inasmuch as home production constitutes about half of full income in Philippine rural households, it makes sense for rural development policies to also support improvements in home technology and the wider use of better home management practices. A new nutrition and health technology, for instance, includes more efficient ways of obtaining the nutritive components of food and more effective means of disease control. The impact of such technological changes on the welfare of household members is clear and direct. Such changes also have an indirect effect on time allocation decisions of the household, such as labor force participation, as home production time becomes more efficient.[4]

We have seen from the empirical analysis above that the home time of the wife is the single most important component of total household production and that the wife contributes as much as about 30 per cent of full income. It is clear, then, that the target of home management extension programs should be the wife, whose managerial skills are the key to the adoption of technological changes in home production. Yet, even as we stress the wife's home production, we must point out that women do play a major role in income-earning market production too. In the discussion above, we have noted that the full income of households with employed mothers is significantly higher than that of other households. Greater labor force participation of women, then, enhances the welfare of the household.

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[4] It is useful to reiterate the distinction between technology and home capital. Some technology is embodied in home capital, but much is not. There are many types of home technology improvement which do not require the purchase of new home capital items.

The role of women in rural households is clearly twofold, as the Laguna data have shown. The woman is the may bahay or "keeper of the house," and as such, her main concerns are the needs of the family in terms of nutrition and health. But her traditional role is being extended to include the need to engage in an occupation in order to help the family financially. With the rediscovery of home production, the wife, in fact, is recognized as a producer in both capacities (an are other household members). This is a big step toward a better understanding of household decisions regarding the allocation of time among market, farm, and home production, and among household members.

Appendix 1

Modelling Time Allocation for Rural Households

The household goods model employed in the analysis of fertility and related investment behavior also provides a framework for the analysis of time allocation (Becker, 1965; Gronau, 1973). In its full development, it is capable of analyzing the household's choice of household goods and the minimum cost allocation of household resources utilized in the production of those goods. The time of household members will be allocated to home production of each good, to market work, and to leisure in such a way as to minimize the total costs of producing any set of household goods (including leisure) chosen by the household. In these models, changes in wage rates, prices of market goods, nonlabor income, or home production factors will lead to changes in household goods consumed and in the allocation of time.[1]

The multiple household good analysis, while critical to the analysis of choice of household goods, is less so for the analysis of time allocation. In this paper, we concentrate only on the allocation of time between home production activities, market or farm enterprise activities, and leisure. The specialization in time allocation within a household between husband, wife, and children adds complexities that are not easily handled in the more general household goods model, therefore we follow Gronau (1976a) in utilizing a model with only two goods, a composite consumption good (Z) and leisure. This allows us to utilize a geometric approach and to focus more directly on the questions of interest.

[1] These models postulate that household-produced goods are arguments in household utility functions. These goods are produced utilizing market goods and home production time of household members. Maximizing utility subject to the full income constraint implies that the household acts as a cost minimizing firm in the production of household goods.

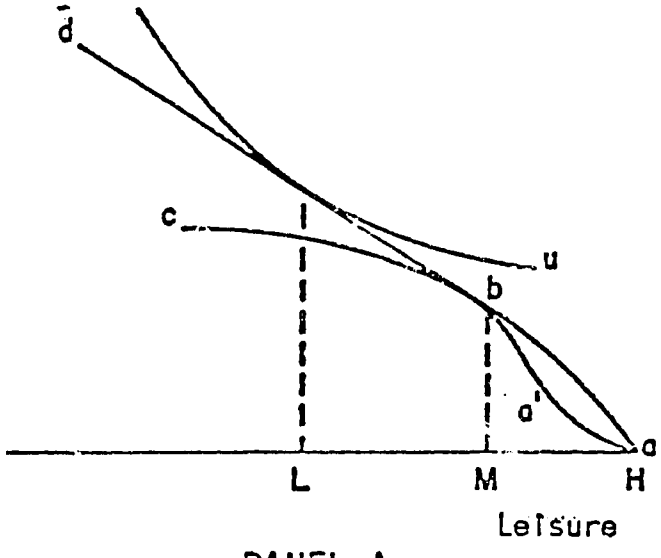
The Single-Person Household

Even though we are primarily interested in the behavior of multiple-person households in this paper, the single-person case affords a simpler exposition of the basic features of the model. Figure 1 portrays several cases of interest. Panel A shows the simplest case. In this case, the household is presumed to have a minimal amount of household resources in the form of shelter, cooking utensils and a small home garden in addition to household time resources. We will also presume that the composite good Z can be either produced in the home or purchased in the market.[2]

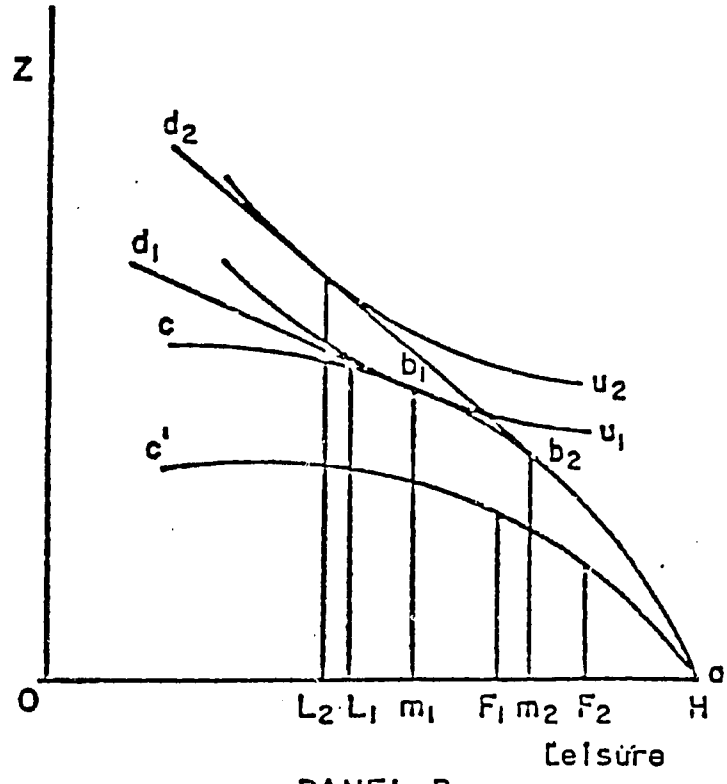
The composite good is measured on the vertical axis. Leisure is measured on the horizontal axis. The point H is maximum possible leisure. The curve a b c traces out what might be termed a home production curve. Its actual shape depends on other sources of income. If sufficient nonlabor income is available to insure adequate nutrition with no home production, the curve will be as depicted by a b c. If this is not the case a relationship between production and consumption will exist. The curve a a' b c shows a nutrition work-effect in which productivity is low at low levels of production. The home production curve is based on rational work organization in which the most productive tasks are first undertaken. Because of fixed home capital resources, diminishing marginal product will be a characteristic of the curve after some point.

[2] This is a critical assumption as it implies that the mix of home-produced and market-produced goods does not affect the productivity of home production time. In the case of farm production to be considered later, this is not as critical.

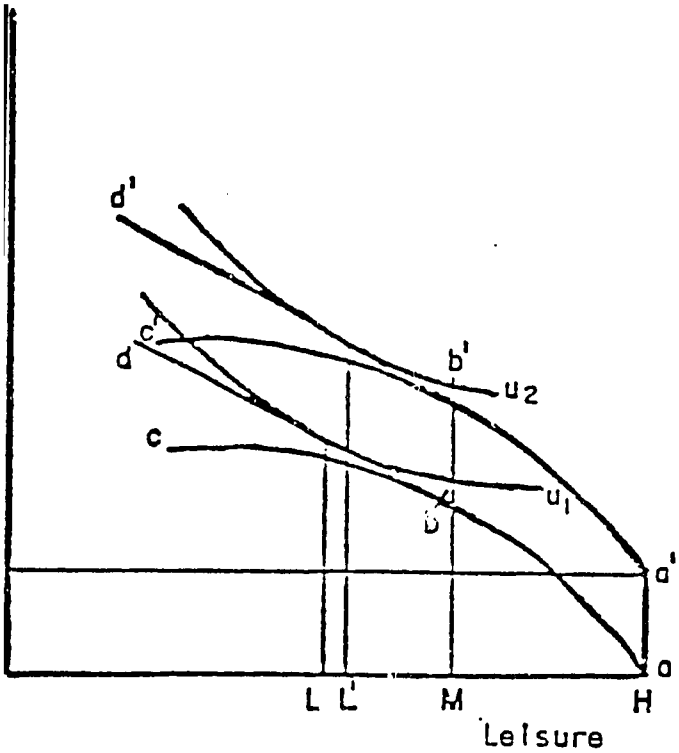
Figure 1. Single Person Household Cases



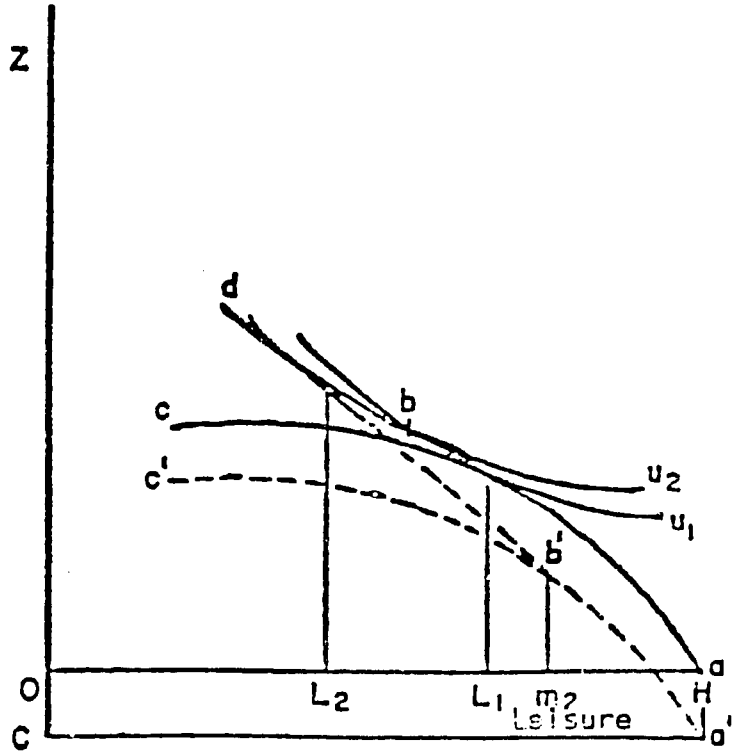
PANEL A



PANEL B



PANEL C



PANEL D

The segment d b in panel A shows the goods-leisure locus offered by the labor market. The slope of the line is the wage rate divided by the goods price. It is located such that it is tangent to the home production function, reflecting the fact that at points to the left of the point of tangency, b, the productivity of time in the market exceeds that in the home.[3] In equilibrium in this simple case this household will devote OL units of time to leisure, LM to work in the market and MH to home production.

Panel B portrays the case where the household has access to land resources and engages in agricultural production. The curve a c' is a home production curve as in Panel A. The curve $a\ b_2\ b_1\ c$ reflects the combined product from both home production and farm production. Farm production is net of payments to landlords and to variable factors so this may depict the case of a small tenant farmer. The segment $b_1\ d_1$ again reflects the opportunities afforded by a labor market.[4]

In the initial equilibrium with indifference curve u_1 with market opportunities $b_1\ d_1$, this household will have 0 L_1 units of leisure, $L_1\ M_1$ units of market time, $M_1\ F_1$ units of farm time and $F_1\ H$ units of home time. Note that the marginal product of home, farm, and market time will be equated so the point F_1 is located where the slope of the curve $a\ c_1$ is equal to the slope of the segment $b_1\ d_1$.

[3] We are presuming here that home time is not sold.

[4] This labor market may be for work on other farms.

Panel B also portrays the simple analytics of the consequences of a rise in the market wage. The segment $B_2 d_2$ reflects the higher wage rate. Note that the point of tangency with the combined home and farm production curve shifts to the right from b_1 to b_2.

The effect of the rise in wages has two parts. The first is the conventional income and substitution effect on leisure which in this sample results in a decrease in leisure from 0 L_1 to 0 L_2. The substitution effect is depicted as outweighing the income effect. This is for convenience of exposition and is not dictated by the theory. The second part of the effect is the displacement effect against both farm and home time. In Panel B farm time is reduced from $M_1 F_1$ units to $M_2 F_2$ units and home time is reduced from $F_1 H$ units to $F_2 H$ units.

Thus, even if the income effect of a rise in the wage rate outweighed the substitution effect (total leisure increased), the displacement effect could still produce a positive labor supply response to a change in the wage rate. A backward-bending supply curve of labor is highly unlikely for a single-person household.

Panel C depicts the analysis of the effects of an increase in nonlabor income. Suppose nonlabor income is increased by an amount sufficient to purchase 0 N units of goods. The total opportunity curve shifts upward in a parallel fashion to a' b' d'. The point b' is directly above b, so the increase in nonlabor income has no effect on the amount of home time (or of combined home and farm time in the case where farm activities are involved). It will increase leisure, however, as long as leisure is a normal good (from 0 L to 0 L' units). Consequently it will reduce market time (from L M to L' M' units).

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5 The relative shapes of the home and combined curves will determine the relative displacement effects against home and farm time.

Panel D depicts the effects of fixed job costs. Suppose that costs equivalent to O C units of goods must be incurred in the form of job search and maintanance costs. The relevant opportunity locus in this case becomes a b d. Note that with job costs, a certain minimum number of time units will be devoted to market work if market work is undertaken. Note also that small differences in the indifference curve or in market wages, can yield large differences in time allocation in certain circumstances. With indifference curve u_1 the equilibrium is O L_1 units of leisure, no market work and L_1 H units of home (or farm and home) time. The indifference curve u_2 produces only O L_2 units of leisure, L_2 M_2 units of market work, and M_2 H units in the home.

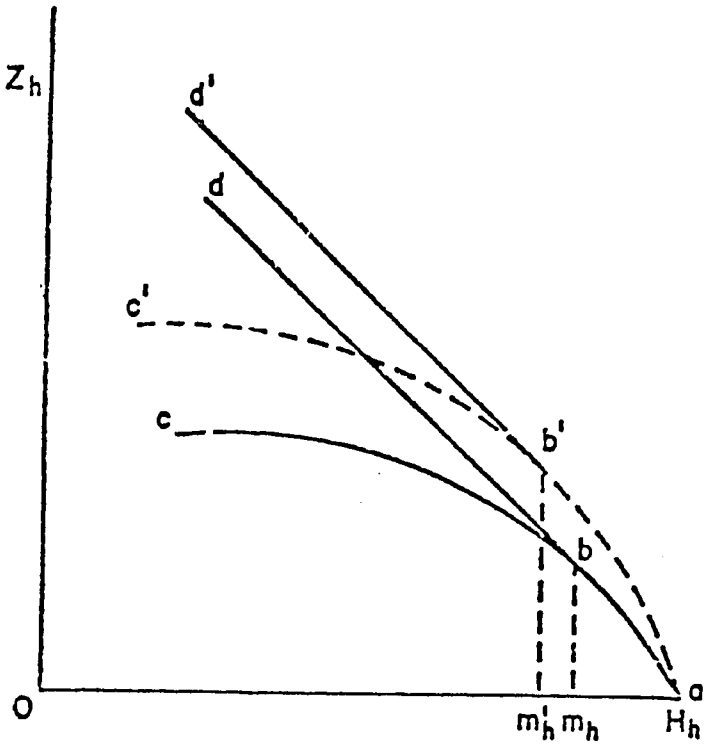
A slight rise in the market wage with indifference curve u_1 would have produced a similar effect as the shift from u_1 to u_2 indicates. In the presence of job costs the "position" of the equilibrium becomes important.

The Two-Person Household

Figure 2 extends the previous analytic framework to the two-person case. The households in our sample are based on nuclear families. The extension of the analysis to consider children and other household members is taken up later. Here we are concerned with the economics of specialization within the household.

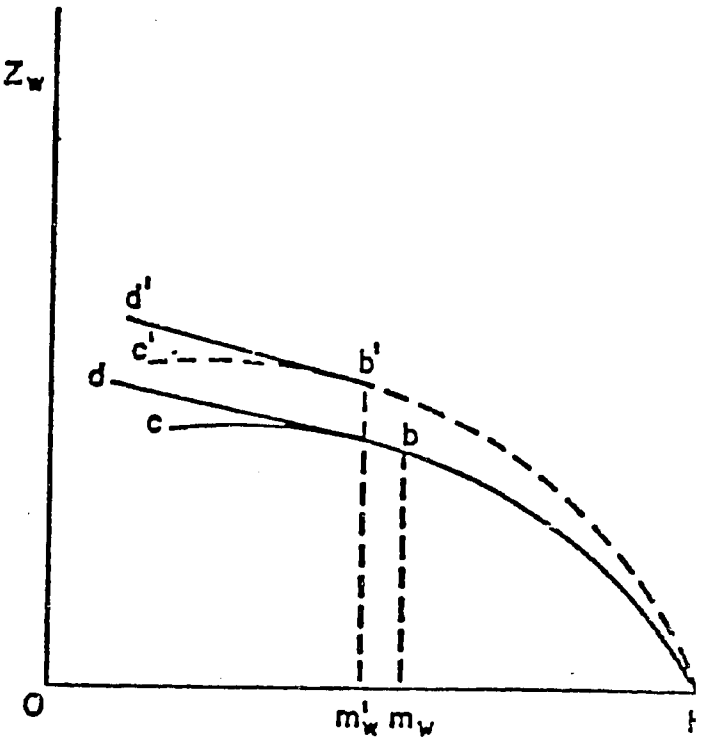
In Panel A and Panel B we depict the single-person case for a husband (Panel A) and a wife (Panel B) acting independently. The opportunity curves a b d are for households without land. The curves a b' d' are for households with land. The home production curve for the husband

Figure 2. Two-Person Household Cases



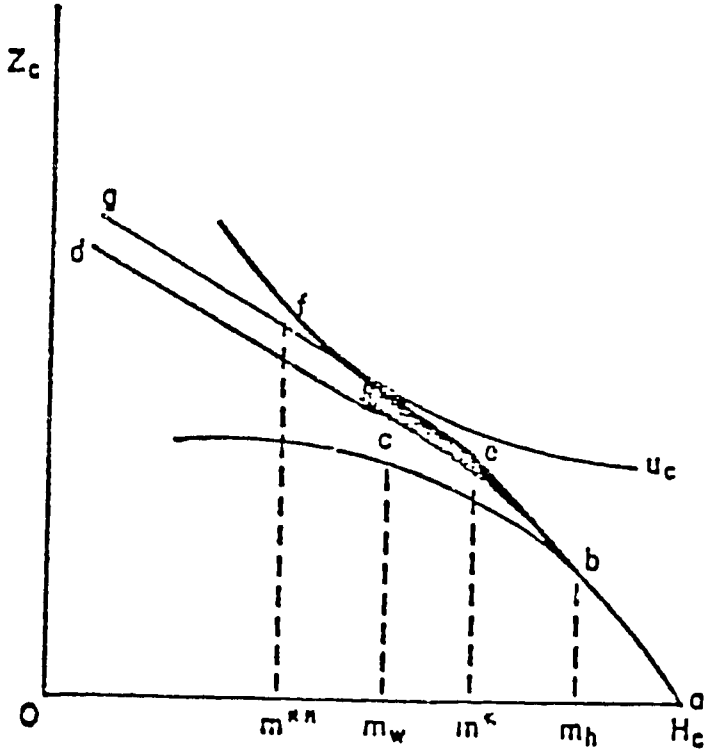
Leisure (husband)

PANEL A



Leisure (wife)

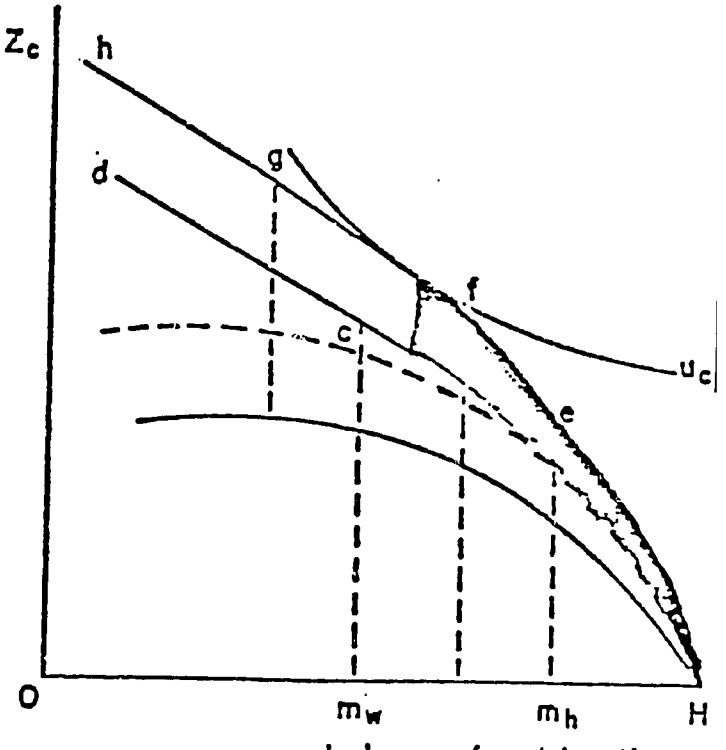
PANEL B



Leisure (combined)

Households without Land

PANEL C



Leisure (combined)

Households with Land

PANEL D

is equivalent to that for the wife. Note, however, that the husband commands a higher wage in the market and is more productive on the farm in this example. This specification is consistent with most empirical evidence.

Panel C depicts the combined household case for landless households. The axis measure goods per member and leisure per member. The curve a b c d represents the nonspecialization combination and is a simple average of the single goods cases. In the segment a b both husband and wife work in the home. In the segment b c the husband is working in the market, the wife is working at home, while both work in the segment c d.

The curve a b e f g represents specialization according to comparative advantage within the household. We suppose here that the wife's time is a perfect substitute for the husband's time in home production. If so, the following sequence takes place. Over the segment a b both will work in the home as this maximizes the combined product. Over the segment b e, the husband will be working in the market at his higher wage rate. It will now be optimal for the wife to replace her husband's home time. Each additional hour that she replaces allows the husband to work one more hour in the market without changing the leisure of either. The segment b e in Panel C will have the slope of the husband's wage rate and will be the same length as the segment a b, because the husband's home time will be entirely replaced.

The segment e f is one in which further specialization takes place. The husband will work in the market. The wife will work on both her own and her husband's home production curves. She will thus not enter the market at the point M_w, but at some later point, M**, where her marginal product on both home production curves has fallen to her wage rate. Both will be in the market after this point.

In the equilibrium (given a household utility function) depicted in Panel C, the wife does not work in the market. The "gains" from specialization are shown as the shaded area. These gains can be associated with the segment b e which will be larger the higher the husband's wage rate and the more productive the wife's home time. The segment to the left of e is larger the more productive the wife is in home time and the more easily substitutable her home time is for her husban's home time. It can also be seen from the diagram that as the wife's wage is increased as the point M** moves to the right. As the wife's wage rises to her husband's level the gains from specialization are reduced.

Panel D, figure 2, depicts the combined case for households with land. The curve a b c d is the simple combination of the single-person cases. The curve a e f g h is based on specialization. Here the specialization begins immediately because of the presumption that the husband is more productive on the farm. In segment a e, the wife is replacing her husband's home time by equating her own home and farm productivity and his home production time. She may not fully replace his home time at the point e. In the segment e f the husband enters the market and the wife further replaces both his farm and home time. Again, because she is less productive on the farm this is a partial replacement so the linear segment e f is less than the length of the segment m $_h$ H (on the vertical axis). The segment f g is curved because the wife continues to work on the farm and the home and to replace some of her husband's farm time. At the point g she will enter the market but will not have fully replaced the husband's farm time. Gains from specialization are indicated by the distance between the two curves.

Appendix 2

Comparison of "Recall" and "Observation" Data

Comparing the two sets of data presents problems, because the "recall" data were recorded in hours per week and "observed" data in minutes per day. Dividing the "recall" data by seven days is reasonable for home production time, but similar treatment of market production time could be misleading, since work days per week vary for different occupations. Thus, the market production of fathers for the "recall" data is likely to be overstated, while that of the mothers is likely to be more consistent for both data sets. Table 1a appears to bear this out to some extent, as the recall method reports a substantially higher level of market time for fathers. These problems, however, are insufficient to account for more than minor differences between the two data collection methods. The clear consensus of both the field staff and the researchers associated with the Laguna Project is that the observation data are highly accurate and not subject to significant bias. Accordingly, we may interpret differences between the two data sets as reflecting bias in the recall collection method.

With this interpretation, we note that the recall method probably overstates the market production time of fathers as well as the home production time of mothers. The major discrepancy between the two methods, however, is the drastic understatement of the market production time of children. The observation method measured more than three times as much market production time for all children as did the recall method. Parents apparently

have a tendency to see children's work on the farm as leisure or as a training activity.

A Laguna resurvey which included many of the original respondent households plus some new ones generated time data also using both methods. The "recall" questions in the resurvey were revised to improve the accuracy of reporting. Leisure was still calculated as a residual. Table 1b shows that home production time collected by the home recall method does not differ significantly from the data generated by direct observation method for both the husband and wife. This implies a gain in accuracy with the revision of the interview questions. Market production, however, was understated for both.

Table 1. Time Budgets of Household Members Using Recall and Observation Data: A Comparison (hours per day)

(a) Laguna Survey

ACTIVITY	Recall			Observation		
	Father	Mother	Children	Father	Mother	Children
MARKET PRODUCTION	8.20	2.80	1.80	6.86	2.55	5.56
Wage employment	4.40	1.40	1.40	2.71	1.14	0.78
Farming	1.80	0.10	0.10	2.60	0.82	2.52
Livestock raising	1.40	0.60	0.20	0.70	0.28	0.57
Fishing	0.20	0.00	0.00	0.25	0.01	0.22
Income earning home production	0.40	0.40	0.20	0.09	0.16	0.10
Others	-	-	-	0.51	0.14	0.37
HOME PRODUCTION	0.60	8.30	2.60	1.29	7.44	13.36
Child care	0.20	1.70	0.60	0.41	2.11	0.97
Food preparation	0.20	3.60	0.70	0.41	2.06	0.84
Others	-	-	-	0.47	2.27	11.55
LEISURE	15.20	12.90	91.60	13.60	14.04	54.75
Personal care	-	-	-	8.48	9.31	37.48
Recreation	-	-	-	4.23	3.77	14.16
Others	-	-	-	0.89	0.96	3.11

(b) Laguna Resurvey

MARKET PRODUCTION	3.44	1.06	6.76	2.92
Wage employment	2.33	0.49	3.31	1.92
Farming	1.10	0.50	2.49	0.62
Livestock raising			0.12	0.15
Others			0.84	0.71
HOME PRODUCTION	1.22	6.32	1.18	5.97
Child care	0.42	1.62	0.17	1.60
Food preparation	0.21	2.90	0.24	1.70
Others	0.59	1.80	0.77	2.66

* This figure includes time spent by children in school or doing school work (9.77 hours per day). The corresponding figure using Phase I data does not include this. Class or school time is classified under leisure.

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Women and Work: The Market Sellers of Lima

Ximena Bunster B.
Clark University

This paper explores the lives of market women in urban Lima and the strategies they use to balance the need to both care for their families and earn an income. Little attention has been paid to these women who have extended and almost exhausted their human potential as women and workers in their struggle to survive in the city. Women have structured a very rational and present-oriented economic role in order to keep from crossing the borderline between poverty and starvation. They have integrated activities within the household with those of production outside their homes in such a way as to mobilize overlapping resources when critical economic or family crises aries.

The main assumption underlying this study is that market women with fixed stalls in the poverty-stricken districts of the Peruvian capital have maximized their potential in the reproduction of their labor power and social production by interlocking household and market roles into a complex process.

Note: This paper is only part of a larger study on women in marginal occupations in Lima, Peru: "La Madre y El Trabajo." The research team included four social scientists: Ximena Bunster B., Elsa M. Chaney, Hilda Mercado, and Gabriela Villalobos. Funding was provided by the National Institutes of Health (Grant No. 1 ROL MD 08353-01), the Social Science Research Council (collaborative grant to Bunster and Chaney), the Smithsonian Institution's Interdisciplinary Communications Program, and the local office of the Ford Foundation in Lima.

The information used here came from a case study of vendors in a cooperative market. Before I turn to analyses of that study, it will be useful to give some general information on Lima's market system and the kinds of markets operating in the city.

The market system in Lima is complex, almost chaotic, and unevenly organized. There are approximately 47,387 small traders who do their business in 290 selling areas distributed in the different districts of the Peruvian capital; 65 percent of these sellers work in fixed installations, and 35 percent are street vendors in and around markets. Of the 290 commercial areas, 41 percent are permanent markets, 32 percent are mercadillos, and 27 percent are paraditas.

The wholesale markets have been built for the purpose out of brick and concrete These markets fall into three categories according to who owns and runs them: municipal (28 percent), private (32 percent), and cooperative (42 percent).

Trading allows them the necessary flexibility to integrate daily maintenance household activities with income-generating pursuits. From the vantage point of their own perception of the scant economic options available to them--basically domestic service, petty trade and factory work for the more skilled -- proletarian mothers value marketing over the other two because they can reduce, in part at least, the conflict stemming from their dual responsibility as workers and mothers.

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Ing. Aida Oballe de Espada, Estudio de la Comercializacion Minorista Tradicional en Lima Metropolitana (Lime: Direccion de Asistencia Tecnica de la Direccion General de Comercializacion de Agricultura, 1971).

The different municipalities in Lima have been responsible for building municipal markets. Municipalities rent stalls and shops to market sellers. These municipal markets usually have facilities that others do not have, such as storage space and refrigeration rooms. Sometimes, however, these facilities are either in need of repair or do not operate regularly. Therefore, the services rendered to market workers are very inefficient. The municipality assumes the responsibility of administering, cleaning, and supplying guards for the markets.

Private markets are housed in buildings that have been constructed for the purpose by private companies or individuals who sell or rent stalls and shops to market sellers. Private markets boast refrigerated rooms, ample storage space, and other services, which are usually run by a concessionnaire who rents them out. Ironically, most of these mercados privados are empty, because the sale or rental prices of the shops and stalls are too high for the average market seller.

Most of the cooperative markets are found in the poorer districts of Lima. These markets have been built by cooperative organizations made up of market sellers. Stalls and services within the market are the sole property of the cooperative, which also manages the market and supervises its cleaning.

The cooperative markets have many more problems than the municipal and private markets. In many cases, the land on which they stand has been seized by the sellers rather than purchased. They have difficulty obtaining financing for land purchase or building construction.[2] In addition,

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[2] According to the study made by Ing. Aida Oballe de Espada, only 29% of the 290 marketing centers in Lima have finished buildings; 19% operate in half-finished buildings; and 53% are functioning the temporary installations. In regard to land ownership, the author also discovered that in 41% of the cases ownership was unclear (the land had been seized by the market workers themselves); 26% of the land was owned by the municipalities; 20% was owned by market sellers themselves; and 13% of the land was rented.

they are harassed by municipal authorities who do not like the cooperatives and believe that all markets should be run by the municipalities.

The Municipal Councils also try to block the proliferation of street vendors. These efforts have led to the mercadillos, temporary markets that the vendors have set up in open lots. They build ramshackle stalls out of whatever building materials are available, in an effort to acquire some stability for trading and to delimit for themselves a specific "selling territory."

The Municipal Councils have also tried to obstruct the paraditas that keep springing up in different districts of the city. A paradita is a trading post, usually erected on a street, where street vendors park themselves in order to sell. Products are sold from carts, tables, and the floor. Street vendors may work in a paradita the yeararound or do business there temporarily. These places offer the vendors no services of any kind and are usually very unhygienic. Paraditas represent the first step towards the development of mercadillos.

Mercado Ciudad de Dios: A Case Study in Survival Strategy

My observations on the nature of the dynamic interplay between household and market activities are based on data from an in-depth case study of a representative sample of market women who have fixed stalls in the market Ciudad de Dios.[3]

The ages of the market sellers at the time of the study ranged from 21 to 53 years; 75 percent of the women interviewed were living with a husband, while roughly 20 percent of them were living with their children and were heads of their families and the main providers. Approximately

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[3] Comparative data on market women selling in markets of middle- and upper-class neighborhoods are available in the larger study, "La Madre y El Trabajo" (see Note, p. 1).

5 percent were living in a consensual union. The number of children per woman fluctuated between one and twelve, with an average of five children per working mother.

Half of the women in the study had started to work when they were eight to fourteen years old. Most of them had migrated from the rural areas into the city and had worked initially in agriculture or domestic service. After their first children were born, they had engaged in street peddling or had gone back into domestic service. Over a third of the women interviewed had been street sellers before promoting themselves into the fixed market stall business.

Methodology

The "talking pictures" approach, a sophisticated combination of still photography and open-ended interviewing, was the method used to communicate with the market women. By structuring questions around photographs relevant to their work, we hoped to be able to understand the women's feelings about the value and significance of their work and their perceptions of their economic role in the marketplace.

The photographs were taken with the cooperation of "key informants" selected from the group of vendors we were studying. These key informants allowed the researchers to follow them around during their daily, weekly, and monthly work cycles in the market as well as during their domestic routine at home. The most relevant aspects of those market and home activities were recorded on film, and the photographs were taken back to the group of key informants, who helped choose the pictures to be included in the final photo-interview kit by indicating which they thought were most representative of their daily routines.

The photo-interview kit included 120 photographs chosen from the 3,000 which were taken. These photos were pasted in a large album which could be accommodated over piles of vegetables and crates in markets. The photos were combined with a structured, open-ended questionnaire.

The photo-interview was organized in three general sets: (1) The Labor Set dealt with work in the market -- the daily work routine, availability of services, union participation, interpersonal relationships, socialization of children in the work environment, perceptions of different occupations, and aspirations for their daughters' future work. (2) The Family Set elicited information on the mother's family life and her interpretation of the significance and meaning of family relations. (3) The Participation Set focused on whether the women had been exposed to political institutions and processes at the national and union levelsand their reactions to political participation.[4]

Background

The market Ciudad de Dios,is a cooperative market functioning in provisionary wooden buildings. At the time of our field work, the members of the market cooperative had decided to build the permanent market site themselves

There is no municipal market among the nine marketing centers in this area. There is, however, an important nucleus of trade formed by the cooperative market Ciudad de Dios, the Paradita del Niño Jesús, and municipal mercadillos. This nucleus is part of the district of San Juan de Miraflores, a low-income district with a high rate of unemployment.

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[4] For more about the method see Ximena Bunster B., "Talking Pictures: Field Method and Visual Mode," in Women and National Development: The Complexities of Change, The Wellesley Editorial Committee (Chicago: The University of Chicago Press, 1977).

The unemployment rate is mirrored in the large numbers of street vendors who have invaded the streets and the cooperative markets. Most of these vendors are jobless men and women who have no other means of earning income. Through them, supplies are channeled to a large percentage of the population of metropolitan Lima. In San Juan de Miraflores there are more market sellers, both street vendors and market workers with fixed stalls, than can be supported by the area's demand; therefore competition for customers is fierce. Many times market sellers inside the cooperative market of Ciudad de Dios have to close their shops when business is slack during weekdays and go out with their merchandise as ambulantes into the neighboring mercadillos and paraditas or to other established Lima markets.

The market offers a variety of products and services: food-- groceries, vegetables, meat, poultry, fish, fruit, spices, prepared foods; baskets, notions, cloth, and ready-made clothes and shoes; and radio and TV repair, cheap jewelry, tailoring and sewing, and hairdressing.

The market women in our study sold vegetables, poultry, fish, spices, baskets, prepared juices and foods, and notions such as thread, sewing materials, and yarn. Only a small percent of the women had small grocery shops; none owned meat stalls, operated the larger grocery shops, or sold ready-made clothes. In other words, they could not operate in areas requiring large capital investment.

Daily Routine

Market women start their working day at 3 or 4 o'clock in the morning when they cook the midday meal for the children who go to school. At 5 o'c they leave for the wholesale market, La Parada,[5] where they go three or four

[5] The best report on La Parada has been written by Richard W. Patch, La Parada, Estudio de un Mundo Alucinante (Lima: Mosco Azul Editores, SRL, 197

times a week, and sometimes everyday, to buy their supplies. Those selling fish go to the Terminal Pesquero, and flower vendors have to go in the direction of the National Stadium. Working mothers go with their youngest offspring, usually babies and toddlers, to these wholesale centers; they take along one or two of the older children to help carry the supplies. Some of the children -- often the middle ones who cannot be carried,do not go to school, and have not yet started working alongside their mothers -- are left behind under the care of an older sibling or an adult relative.

These market women will finally arrive at their market at 6:30 a.m. They open their stands, distribute the freshly bought merchandise, and have breakfast with their children before sending them off to school. Market activities start very early. The busiest selling hours are from 7 to 10 a.m., and business drops off around 1 p.m. Lunch is eaten on the premises. The more prosperous market women buy a hot lunch from one of the many restaurants inside the market. Most market women, however, have their lunch brought from home by one of the children on their way to the afternoon school shift.

At 5 p.m. the market closes and the mothers go home to their families. More work awaits them there: cooking the whole family's evening meal, sewing, washing and ironing clothes, and putting the children to bed. Most of the women in our study agreed that they preferred work outside the home, where they had a window to the world, to the drudgery of the household routine; but all of them complained about the difficulty of getting enough sleep because of the pressures exerted upon them by their double roles as homemakers and market sellers.

The twenty-one women interviewed in depth for two to three hours agreed that market selling was more appropriate for a working mother than domestic service or factory work. Approximately half of them had done agricultural work before coming to the city, another half had been domestic servants. Many of them had progressed from agricultural activities to domestic service to street vending, and ultimately to market selling.

The decision to engage in street peddling and market activities had been reached by each woman independently from her husband or compañero, often after more than two children had been born or when the wage earnings of the father were less than adequate. For example, Tomasa, a 44-year-old mother who had worked first as a domestic servant said:

> Fortunately, I am a market worker and I learned my trade at the age of 12 when I was hired as a domestic servant after both my parents had died. The woman for whom I worked was a market seller and she taught me. I became very good at running a business. I have spent my life doing it. But I have also been a factory worker and a domestic servant. This was when I had no children. After my girls were born I became independent as an ambulante. I did not want to work in factories or in private homes because then the mother has to lock the child up in order to go to work. And I said to myself, "My little daughter is not going to suffer, I won't let that happen." I've continued working in the market business all these years. One has to be awfully patient, for there are times when one earns a bit and there are times when one loses money instead. It's uneven--you earn, you lose.

Trading allows these women the flexibility to integrate daily maintenance household activities with income-generating pursuits. Market women can minimize the conflict arising from their roles as workers and mothers. The illustrations that follow exemplify the balance they try to maintain.

The Economic Value of Children

It has been previously observed that market women are quite independent. Decisions dealing with market and household tasks are taken without consulting the husband. Women run their families and their businesses in very similar ways.

Children are organized and directed by their working mother. She decides who stays home to look after younger brothers and sisters and who cooks, runs errands, and brings lunch to the market. Children are constantly shuffled between home maintenance activities and market activities. At the age of ten, children start working alongside their mothers. It is very common to see children behind counters while the mother is home looking after a sick baby or taking time off from her selling.

Child labor is looked upon by mothers as necessary for the survival of the whole family. Eight to twelve-year-olds rapidly learn the business and are able to sell, handle money, and market food like adults. Sometimes they even make more than their mothers. Therefore almost all women who have worked for long periods of time are aided by their offspring.

With very few exceptions, almost all the women interviewed in our study had been born in rural areas and had migrated to the city. It is easy to hypothesize that they had carried to the urban world the traditional attitudes toward child rearing of the rural areas, where the learning of income-generating activities by peasant children plays a major role in their socialization. Carmen Diana Deere, an economist who has given a lot of attention to the interpretation of children's contribution to production within the peasant family economic unit on the Peruvian minifundia, says:

> The more children, the more hands available to relieve the mother of many small tasks, enabling her to devote more time to complementary activities to the family's subsistence. Also, a larger family increases the possibilities of generating income from the sale of handicraft or processed products which take a larger input. The more children, the greater the possibility of increasing the number of farm animals, generally under children's care, which improves the family's liquidity. A large family also increases

> the possibility of farming more land -- first from the increased economic possibilities for saving, to rent or purchase more land, then by the possibility of having sufficient family labor power on hand to undertake the expansion of the land base. [6]

The proletarian urban market mother, like her rural counterpart working in the fields alongside her children, maximizes the utilization of her family's labor power in order to earn more cash. The average market seller cannot afford to hire an adult assistant to help her in the market trade; therefore she either works alone or is assisted by her children.

Health

This is another area in which household and market activities influence each other. For instance,if a woman gets very sick, she will close up her stand and go home; if a child or relative becomes ill, she will stay home and send an older son or daughter to take over the business. Thus, whatever happens in her family affects her work, and vice versa. Crises are resolved with the collaboration of the same family personnel--children, the market worker's mother or sisters, and, in rare cases, the husband or mate.

The market in which they work has a direct bearing on the frequent sicknesses of these mothers and their children. Markets like Cuidad de Dios have been constructed without taking into consideration the needs of the women engaging in the trade or the basic space requirements for cleaning the market and disposing of its waste products. There are no daycare centers in markets, no emergency clinics, no sanitary toilets. If somebody gets sick the patient has to be taken to a private doctor because there is no form of socialized medicine available. Market women run into debt to pay high doctor's fees Bronchitis, colds, varicose veins,

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[6]Carmen Diana Deere, "Theoretical Considerations of the Division of Labor by Sex and Subsistence Production on the Minifundia." Mimeograph, p. 41.

gynecological problems, and kidney trouble are attributed by women to their unhealthy working conditions. Garbage piles not removed daily from the markets trigger infections that affect children quite severely. Garbage and unsanitary toilets endanger the health of those involved in the market business.

If these conditions were improved,the mother's workload would be eased and the average female market seller would greatly decrease her absenteeism from work; her earnings would increase if she did not have to close her store for days and sometimes weeks to attend to the welfare of her family members.

Lack of Storage Space and Refrigeration

Storage space and refrigeration are simply not available in most markets; Ciudad de Dios is no exception. Working mothers apply the same daily, present-oriented criteria to the purchase of their groceries for their home consumption as to the purchase of merchandise they resell in their business. Perishable goods that begin to spoil are taken home for the evening meal. As one of the informants explained, "Anything that starts to rot or that I was not able to sell and will not be fresh enough for customers the following day I take home and fix something for all of us in the family to have. It is usually a stew or a soup."

Adelina, 35 years old and mother of seven, sells fish, although in the past she has sold other products such as vegetables and fruit. She is willing to assume the high risks involved in selling fish because sometimes earnings are good. Like the rest of the sellers involved in the same business, she has to go practically every late afternoon or evening to the fisherman's wharf in Chorrillos. She buys fresh fish that she puts in a large basket full of layers of ice, which is the only way she has of keeping the fish fresh. She and the other fishmongers from Ciudad de Dios

hire a van to take these baskets back to the market for sale the next day. In spite of these precautions, fish spoil very rapidly, and Adelina and the other sellers often have to lower their prices. On days when sales ar slack, they almost give the fish away.

Because there is no way to store or refrigerate poultry, live chicke are kept in cages in the market stalls and are slaughtered, plucked, cut u and cleaned by poultry venders themselves. This procedure is expensive si money has to be invested in kerosene stoves, kitchen utensils, and wooden crates. As stalls are small, they can hold one crate at a time which can temporarily shelter twelve chickens. When sales decrease, live hens have t be kept for days in crowded conditions. Market women complain that the chickens rapidly lose weight in spite of their efforts to feed them.

Inefficient Buying Mechanisms and Lack of Credit Assistance

Unfortunately, cooperative markets like Ciudad de Dios do not buy in bulk directly from the producers; therefore market sellers have to supply themselves individually.

Wholesale dealers who buy vegetables, fruit, flowers, and chickens from the producers in the rural areas sell their wares from trucks parked i vacant lots adjacent to the markets and paraditas They are the "middl men" in the market supply chain. Small retail dealers, like the women of our study, either buy from them or go to La Parada. In either case, the products are more expensive because they have been through the hands of intermediaries.

The amount of time, energy, and cash spent in supplying their stalls is a constant physical and financial strain on market sellers. They have to get up at the crack of dawn, take their children along with them, spend money on bus fares, and pay carriers to load their purchases on buses, truc or taxis.

For example, Marcela, 36 years old and mother of three, has a vegetable stall where she sells mainly potatoes and onions. Her plight, as she explained in detail, is common to all market women. Marcela has to start worrying about the next day's purchase before she has finished selling for the day. She described at length what happened when she had to buy a sack of onions at a time when there was an acute shortage of this product.

> Would you like to know what I do in order to make sure that I'm going to have access to a sack of onions? After I close my stall at 3 p.m., I go to the wholesale market and go into the onion and potato section as if I were a regular hoodlum! By this I mean that I have to lie to the guards to let me in after convincing them that I'm a wholesale dealer myself and that I'm going into talk to my sister who's already inside. I go better dressed to impress them. At 5 p.m. one of the wholesale dealers arrives in his own truck. "Will you sell me a sack of onions, senor?" (I beg of him). He answers, "Yes." But there I have to wait for about three hours till he finally gets around to selling me one. By this time it's already 8 p.m. I mark it with my name and go back home to eat supper. Then I return to the wholesale market where I sleep keeping an eye on my own sack.
>
> Sometimes everything is so hard! Shortages of certain products make it so tough for us! It is then my children practically don't go to school, they are exhausted and go to sleep in class, under the teacher's nose. I blame myself because I've had my children stay awake all night helping me out at the wholesale market. When I see them so tired, it breaks my heart and I feel so guilty and so powerless!

The more prosperous market sellers, usually men, become major capitalists in their own right within Ciudad de Dios and other such markets, because they can invest large sums of money in the purchase of goods. When a product is scarce, they rapidly buy it up and store it until the shortage becomes really severe. Sometimes market women have to turn to them and pay exhorbitant prices for foodstuffs like rice, which they need to have in stock in their small grocery shops. If women do not carry staples like rice, a basic ingredient in most native Peruvian dishes, they will lose their regular customers to other sellers.

Proletarian working mothers, who usually do business with scant capital, are perfectly aware that they are exploited by these wholesalers inside their own market. As Juanaticilla, mother of seven children and owner of a small grocery stand put it:

> These big sharks, the rich wholesalers, are the ones responsible for soaring prices. By hoarding products and exerting control by monopolizing them, they make the product more expensive to us and to consumers. The wholesalers are the ones who get enormous profits but we poor, common market sellers, suffer very much.

Cooperative markets are cooperative in name only, for they offer no credit assistance or other help to their members. Two thirds of the women in our study have a stall in the market because they had been part of the group that seized the plot of land on which the market is built. In many cases, they had built their stalls themselves. They have to pay a high monthly fee in order to keep necessary common services going, like guards to police the stocked stalls at night. In theory, the market belongs to the group, not to individual stallholders; in practice, however, a great deal of speculation in stalls goes on and rents and transfer payments are demanded. Such demands are difficult to meet. In the group we interviewed there were two women who, because they needed extra cash to pay the transfer fee for a stall, had to hire themselves out as domestic servants for a period, leaving a relative to look after the market stall.

Most of the women in our study were illiterate or had had an average of three years of primary schooling (although there were a couple of exceptional women who had had some high school education). As a rule, market women have not had the opportunity to learn the arithmetic and perhaps basic accounting that would help them in keeping a record of the capital invested in their business and their daily, weekly, and monthly earnings.

At no point in the process of buying and selling do these women have an exact idea of the amount of their capital. This lack of specific information is aggravated by the fact that they have to draw from it quite regularly to attend to urgent family needs. There are no fixed boundary lines between what percentage of their cash is spent on investment in merchandise and what percentage is alloted to fixed family spending or to emergencies.

The habit of taking perishable stall merchandise home for family consumption or of drawing upon their non-perishable goods (infant's clothing, cloth, yarn, etc.) to meet private famuly needs contributes to their lack of capital. Most women's earnings from a day's sale in the market are not high enough to compensate for the use of foodstuffs and other products from their stalls to fill family needs, so in the long run, women are forced to cope with a drain on their capital. This contributes to a gradual home and market improverishment in periods in which the market business is slow. At best their capital remains stationary and they can never expand it enough to stock their stalls adequately and obtain higher earnings.

Harassment by Municipal Inspectors

The Municipal Council of each Lima district tries to regulate the market business in order to protect consumers. Uniformed municipal inspectors are sent out to see that the official prices (set by the government) are respected. However, many inspectors use their authority arbitrarily, intimidating the powerless market sellers in order to make the sellers pay bribes -- in cash or scarce foodstuffs -- to avoid fines or jail terms. Even though the sellers have not broken the law they are powerless to fight back.

The following two cases, as explained by the affected women themselves, illustrate this constant police harassment and the conflicts which they generate. Alina, mother of five children, sells sewing materials and baby clothes in her small stall. She used to sell mondongo (tripe) as a street vendor at mercadillos and paraditas.

> One day my son was helping me sell mondongo. I was running an errand when a municipal inspector reprimanded my boy and confiscated our scales. Without scales we cannot do business. He also fined him for being outspoken. I went to talk to him and he insisted on the fine because, so he said, my son had insulted him. I couldn't believe him. I told him, "My son is going to school and he is learning lots of things, among others, respect for adults, so he couldn't have been offensive in his language towards you." The inspector said that he would only return the scales if my son begged his forgiveness. "Of course he won't do that, if he hasn't offended you! I would rather pay you this fine than have him come crawling to you." So I paid him ten libras but he wouldn't return the scales until I had given him a kilogram of mondongo free! He took the mondongo forcibly away from me, a large quantity that I needed to sell!

Maria, who sells poultry, describes what happened to her during a week in which she had run out of money.

> Many times these municipal inspectors will squeeze you like a sponge to get money out of you. I have cried so many times when I have been the easy prey to their injustice! One day I did not have any poultry to do business with so I brought a duck that I had at home. An inspector came along and he fined me because I did not have the invoice to show where I had bought the bird and how much it cost. I explained to him that it was my own, and that I needed to make a little money out of its sale. Instead of helping me, he fined me for not having the invoice! I appealed to the Concejo Municipal. I was so desperate that I wept in front of the authorities and I told them, "Please let me work in peace. I also have a right to this life and so do my children. You oppress me with unfair fines and treatment. You oppress me to the point that you make me feel you don't want me to live. Look, I had to bring this duck from home out of need; otherwise I wouldn't have anything to sell!"

In cases where a proletarian mother is abused by a municipal inspector, her fellow workers do not come to her defense. In answer to the question What do you do when a co-worker, a mother like yourself, is unduly fined?" the patterned response obtained from all of them has been, "She has to deal with it herself, it's her problem."

The fact that market women are burdened by both household and income-generating activities contributes to their powerlessness as a group. They work in isolation and with minimal ties to neighbors at home and co-workers in the marketplace. Therefore they do not participate actively in community agencies, which would help them become aware of their common needs as working mothers, or in labor unions, which would foster their sense of solidarity.

Toward Economic Autonomy for Women: Intentional Associations and Collective Action

Dorothy Remy
University of the District of Columbia

In this paper I develop a theoretical approach to the study of women in which the social and economic processes which produce "poverty" are distinguished from the condition of "being poor," in the sense of lacking material resources. The process of impoverishment is butressed by institutions that maintain a distribution of resources and power from which women are largely excluded. This systematic and institutionalized exclusion of women can be distinguished from the various ways in which individual women are mistreated. I argue later in the paper that policies aimed at strengthening the intentional associations of women help establish mechanisms through which the redistribution of corporate social and economic power may be accomplished. Examples of effective collective action by Nigerian and Kenyan women are used to illustrate the effectiveness of this approach.

The distinctions between "being poor" and "poverty" and between "mistreatment" and "oppression" help focus the theoretical discussion that follows. It may be helpful if I state at the outset how the terms will be used here. Poverty is the result of an economic and social process whereby personal and material resources are systematically and disproportionately concentrated among a small proportion of the population, usually those who own productive resources. The process is maintained by a wide range of institutions, including the family, the church and schools, as well as the government itself. "Poor," on the other hand, is a term describing those with inadequate material resources. Farmers in the Kenyan highlands, for example, were <u>poor</u> before colonial rule , but their

impoverishment began with colonial restrictions on their access to land and cultivation of cash crops.

The second distinction is between "mistreatment" and "oppression." "Mistreatment" is simply hurting another person. It has an idiosyncratic quality to it--a person who has been hurt, either physically or psychologically, attempts to gain a momentary sense of power by hurting (mistreating) someone else. "Oppression," on the other hand, is the systematic and institutionalized restriction on the participation of people in the social, economic, and political life of their country. Oppression is one-way. People from a socially dominant group oppress those from a subordinate group.

The distinction between being poor and poverty is helpful, because it enables us to specify areas where external intervention may or may not have beneficial results. Improving the material condition in which people live--focusing on the problem of being poor--implies a set of policies which could include provision of public housing, free lunch programs, neighborhood health clinics, installation of sewers and running water, and the like. In each case the policy objective is clear. It is to provide materials and services that will improve the physical well-being of poor people. A focus on reducing or eliminating poverty, on the other hand, necessarily involves at least some restructuring of social, economic, or political relations. In the example just mentioned, redistributing farm land from white settlers to Kenyans was a necessary step in reducing their poverty. The policy becomes one of restructuring institutionalized and legal social relations to benefit those who are impoverished.

The two parts of the analysis come together at this point. The social relations that keep people in poverty are oppressive in that they deny equal access to resources and full participation in decision-making to identifiable social categories within the population. From this it follows that policies

oriented toward reduction of poverty among women must necessarily incorporate a restructuring of the institutions which oppress them. It also follows that policies oriented toward improving the material condition of women will not necessarily reduce the oppression of women but may ameliorate the conditions which perpetuate their mistreatment.[1]

It is necessary at this point to provide a brief description of the conditions under which many African women live. I call attention to the historical process through which urban women became impoverished and to their ad hoc responses to their situation. With this sketch of individual strategies for survival as background, I then turn to an analysis of the more effective and enduring results of intentional associations and collective action.

Women in Kenya

Kenyan Women's quest for wage employment and their income-producing strategies are shaped by the pervasive oppression of women and by the historic development of Kenya's cities. The British colonial government prohibited migration to the cities without proof of employment. Since few women were hired by colonial merchants or by the government, this policy resulted in a disproportionate number of men living in the cities, as well as the development of "illegal" communities of urban women who provided services for the male population. Although urban migration is no longer illegal, and the proportion of women in the cities is nearly equal to that of men, the effects of the colonial policy can still be seen.

[1]The institutionalization of the restrictions placed on women's participation in economic development has been amply documented elsewhere. See among others, Esther Boserup, Woman's Role in Economic Development (London: Allen and Unwin, 1970); Laurel Bosgen, "Women in Modernizing Societies," American Ethologist 11 (November, 1975: 587-601); Dorothy Remy, "Underdevelopment and the Experience of Women: A Nigerian Case Study," in Rayna Reiter (ed.) Toward an Anthropology of Women (New York: Monthly Review Press, 1975); and Ann Rubbo, "The Spread of Capitalism in Rural Colombia: Effects on Poor Women," in Reiter, 1975. Issues 12/13 and 15 of Latin American Perspectives (1977) develop the general position further.

The assumption that men would be the primary wage earners in urban households lay behind colonial policies of differential minimum wages for men and women. The legal minimum wage for women is two thirds that of men The present earnings ratio for men and women is 3:2. Without a change in government policy, it is unlikely that women's relative economic position will be changed. Women are disproportionately concentrated in the service sector and in the lowest paying jobs--laundry, personal service, and hotel and domestic service--within that sector.[2] In addition to the disproportic concentration of women in low wage employment, more than twice as many wome as men are unemployed--that is, looking for full-time wage employment and unable to find it. The International Labour Office Employment Mission to Kenya concluded that male household heads had an unemployment rate of 4.2 t 4.9 per cent while female household heads had an unemployment rate of 10.5 to 10.8 per cent in 1970.[3] And an even higher proportion of women are not seeking full-time wage employment and are relying for survival on income fr a range of other activities.

In addition to restricting urban migration to the wage employed, the colonial government's policies for regulation of the economic activities of the indigenous population included numerous restrictions on the behavior and mobility of those living

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[2] Employment and Earnings 1971, Kenya Ministry of Finance and Economi Planning, Statistics Division.

[3] International Labour Office, Employment, Incomes and Equality; A Strategy for Increasing Productive Employment in Kenya (Geneva: ILO, 1972), pp. 55-56. Sharon Stichter's interpretation of the data on women's employment is different from that of the ILO report. See Stichter, "Women in the Urban Labor Force in Kenya: Problems and Prospects," paper presente at the Conference on Women in Development, Wellesley College, June 2-6, 19;

in the city. Many of these restrictions remain in force and directly affect women. For example, petty trade, the basis for the economic autonomy of West African women is restricted by law in Kenya to those who buy a hawker's license. In addition, the number of licenses issued is limited by the availability of stalls in municipal markets. Illegal trade provides a variable source of income to unemployed women. Another source of income is brewing beer, also an illegal activity. A social worker in Mathare Valley, a large squatter settlement in Nairobi, reported that a woman could earn up to 50 shillings per brew, but added that the very high incidence of police raids, rainfall, or accident made it difficult to estimate, even crudely, average earnings from beer brewing.[4]

Women unable to make a monetary contribution to the household unit must exchange their physical services for support. For some women this may mean simply performing household chores, but for many it means providing sexual services. One observer reserves the term "prostitute" for a woman who is capable of earning income in a "legitimate" manner but chooses to earn part or all of her income from the sale of sexual services. She estimates that there are relatively few women, about 5 per cent, who are prostitutes in this sense, but that there are large numbers of young women who sell sexual services only because alternative sources of income are not available. Sale of sexual services ceases, she adds, when other possibilities of earning income are available.

These major sources of income are illegal and hence not reported; there is, therefore, no way of estimating the proportion of "unemployed" women who obtain income from trade, sale of beer, or sexual services.

[4]Julius Carbach reports that in the early 1960s over 10,000 women were convicted of crimes against three local ordinances; the Liquor Ordinance, the Traders Licensing Ordinance, and the Vagrancy Ordinance. Carbach, "The Position of Women in Kenya," Economic Commission for Africa, Workshop on Urban Problems: The Role of Women in Urban Development, September 1963.

Because such activities are illegal and therefore entail some risk, and because income from these sources is highly erratic, most women resort to such activities only when sources of regular income are not available. Few women have access to other means of earning income, however. From half to three fourths of all women household members are dependent on a male supporter for their maintenance with only these very erratic and risky alternatives available to them.

Women's Intentional Associations: Examples from Kenya and Nigeria

The foregoing discussion serves to indicate the sense of powerlessness that accompanies both poverty and oppression. In each case institutions over which people appear to have no control directly impinge on their lives. It is this sense of powerlessness that has in the past led both men and women to band together with others for the purpose of gaining some influence over the institutions which seem to control their lives. The organizational basis of such associations has varied with circumstance. Sometimes the basis has been common work place; at other times ethnicity or residence has been the bond. Women have participated in all such associations. In some instances, women have joined together to improve the material conditions under which they live or to stop persistent mistreatment. Whatever their focus, such associations enable women to begin the process of overcoming a sense of powerlessness.

Associations of women, whether spontaneously formed or initiated by respected outsiders, provide a firm basis for implementation of policies to improve the material conditions of women or to restructure the institutions which currently oppress and impoverish them. A necessarily brief discussion of the structure and organization of two successful strategies through which women asserted control over their environment will illustrate the point. One strategy, illustrated with two examples from Kenya, is to focus on self-help mechanisms of improving a group's material condition, a focus on the condition of "being poor." A second strategy, that of

mounting a collective challenge to institutionalized discrimination or potential impoverishment, is illustrated by two movements in Nigeria.

The two examples of women's collective action occur in extremely different historical and cultural settings. It is necessary, therefore, to provide some introductory background.

Nigeria and Kenya are the two most economically developed countries in their respective regions. Each experienced British colonial rule. The variations of natural resources and the ethnic diversity within each country, in the context of a colonial policy oriented toward quick profits, resulted in extreme variation in the degree of incorporation into the international economic system of the various subpopulations within each country. The rivalries among regions and ethnic groups thus fostered by the colonial governments as a mechanism for inhibiting united challenge to exploitative policies have persisted since independence. The Nigerian Civil War is the most dramatic illustration of the point.

With the exception of small coastal city-states, the people of Kenya did not directly experience centralized government until British colonial rule. A defining characteristic of British policy in Kenya was the exclusion of the indigenous population from cash crop agriculture and trade. Both of these important economic niches were filled by settler groups alien to the land. These two groups became the focus of nationalist opposition. The Mau Mau movement was instrumental in eliminating the white settler population in the 1950s, and recent action by the present government has effectively eliminated the Asian merchants and their families from the country.

Women did not have leadership roles in either nationalist ventures,

nor did they benefit from the redistribution of economic resources following the expulsion of the settler group.[5]

Self-Help in Kenya

One successful effort of Kenyan women to overcome their economic liabilities has been co-opted by the government. The well-publicized Harambee movement had its origins in village self-help projects. Prior to the government program, village women organized along clan lines pooled their resources to provide capital for improvements. For example, the women, tired of collecting thatch for roofing each season and of constantly fishing the resident maggots from food and bedding, wanted to substitute zinc roofs for their thatch. None, however, could buy such a roof with the money she made from the sale of small amounts of surplus food. The women pooled their resources and bought roofs one at a time for the contributors. In a similar manner huts were fenced, small animals purchased, wells installed, and other improvements made. The primary distinction between the village program and the government program is that the villagers retained complete control over the projects, the order they would follow, and the money.

Kinship ties among the urban population lack the depth of those in the village (although kin-based associations do exist in the squatter settlements); the following case illustrates the potential of cross-class, non-kin cooperative enterprises.

In 1966 women organized a textile factory which, by 1973, employed fifty-four residents of a Nairobi squatter community on a piece-work basis to make silk-screen printed fabric. The manager of the enterprise, formerly a Community Development Officer, was trained in Israel in all phases of

[5] See A. Nipper "Equal Rights for Women in Kenya?" Journal of Modern African Studies, 9 (1971), pp. 429-442; S. Stichter, "Women and the Labor Force in Kenya, 1895-1964," Rural Africana, Special Issue on Women, 29 (Winter, 1976).

textile manufacturing. Women from the squatter community who had had primary schooling were trained as acting supervisors. The production process enabled women to do hand work, such as hemming finished garments, while others prepared the cloth and dyes for printing. All of the women helped with the silk-screening.

The factory made a high-quality product that sold profitably both in Kenya and abroad. The technology selected was appropriate for both the product desired and for Kenyan conditions. Women controlled all aspects of the enterprise--commercial, technical, managerial, and productive. They created flexible work hours and established a children's center adjacent to the workplace. The on-the-job training provided an avenue for upward mobility for the community women, while their income as workers enabled them to support their families. The economic success of the enterprise led to a gradual change in its orientation, however. By the late 1970s the factory had moved from the squatter settlement to a new and larger location in the city. Poor women were no longer able to walk to work nor could their children drift in after school.

In spite of their limitations, each of these efforts was undeniably successful in effectively addressing the needs of poor women, even though neither group of women challenged the institutions which limited their material resources. Nigeria provides two case studies of women acting together to challenge the imposition of systematic barriers to their full participation in the economy of their country. The Nigerian women who mounted this challenge drew extensively on the religious and economic bonds forged prior to European rule.

Protest in Nigeria

Nigeria, unlike Kenya, had two powerful centralized state systems and a range of less powerful, but still centralized, regional political systems prior to colonial rule. Hausa city-states controlled the northern part of the country, while the Yoruba state controlled the west. In these parts of the country large cities dominated their respective hinterlands and were the focus of local trade in subsistence crops as well as long-distance trade in luxury craft products. Men and women in the cities participated in the manufacture of handicrafts, food processing, and trade. There was widespread use of slaves in both the major state systems. Elite women organized the productive activities of their slaves and used the profits to maintain power in a hierarchically organized women's political system which operated independently from that of the men. Outside the major states, in the eastern part of the country, women controlled aspects of intervillage trade in agricultural products. Their political power was expressed by direct participation in village councils as well as indirectly through religious cults.[6]

Women in the western and eastern parts of Nigeria benefited immediately and directly from the early penetration of merchant capital. In the 1920s women in the south-east made large profits from the sale of casasava, palm kernels, and palm oil. Later, in the 1940s, women in Abeokuta, in the west, also profited from their role in the distribution of imported manufactured goods, especially textiles. The two markedly successful women's protests occurred when colonial officials attempted

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[6]The discussion that follows is based on two unpublished seminar papers by Nina Mba of the University of Ibadan, Department of History; "Nigerian Women in Political Action: The Abeokuta's Women's Union 1946-1949" (1974) and "The Women's War in South-Eastern Nigeria 1929-1930" (1975).

to impose special taxes on the women traders. In each case, the taxes would have represented the first step toward oppression of women--that is, the imposition by the state of policies intended to restrict women's access to economic power.

The two protest movements had several features in common. First, each relied on the discipline and experience in collective organizations that the traditional associations provided women. The form of "sitting on a man" was used by Ibibio women to effectively immobilize the District Officer in his efforts to impose a tax on women. The powerful women's trade associations, which were organized along commodity lines, greatly facilitated mobilization of Abeokuta women threatened again by a tax aimed directly at them. Second, each group benefited from the support of women with Western schooling. Legal advice, assistance with petitions, and effective use of publicity were facilitated by the active participation of educated women. The powerful links among women forged in their associations enabled cross-class participation in the protest movements. Third, the mass mobilizations produced indigenous and powerful leaders who were able to effectively argue the case for women after the initial crisis of the taxes was resolved. Fourth, solidarity among the women was facilitated, ironically, by their exclusion from the colonial government. Unlike the men, the women were not at this point divided from each other by differences in access to the benefits of cooperation with the colonial government.

Neither protest was able to halt the erosion of the economic base of women in Nigeria. Nonetheless, women still have a collective strength in areas that concern them as a result of the persistence,

though weakened, of their earlier forms of organization.

There is no need to belabor the point that women in Africa have not benefited from the pattern of economic development seen in countries with strong ties to Western Europe and the United States. To continue to simply describe the dimensions of "being poor" is to avoid analysis of systemic impoverishment and, with it, of women's oprression. Policies oriented toward improving the lot of poor women should not be discounted because they fail to challenge the structures that generate poverty. The appropriate base for any challenge to systematic limitations of economic, social, and political participation in any society are the men and women who experience them directly. Women's intentional associations, whatever their initial focus, are a flexible and at times powerful instrument through which poor women may challenge poverty.

[7]Dorothy Remy "Social Network and Patron-Client Relations: Ibadan Market Women," unpublished manuscript, 1968; and Remy, "Under-development and the Experience of Women. A Nigerian Case Study."

Women, Work, and Child Welfare

Barry M. Popkin
University of North Carolina

It is widely recognized that a mother's activities have important impacts on, among other things, her child's health, nutritional status, and intellectual development. Most women who play active parts in household economic life commonly are expected to maintain major household duties. In some cases the mother's economic role may be compatible with her childcare functions, so that she can both work and care adequately for her children; in other cases there are likely to be tradeoffs between home-related needs and market activities. If the tradeoffs result in the absence of significant maternal inputs to the household, there may be a decline in child welfare unless the maternal inputs can be substituted for by increased contributions of other household members and/or market-purchased goods. There is a critical qualitative dimension to these substitutions, however, For example, it is possible that child welfare will still suffer even if the total childcare time remains constant, if those who substitute for the mother's time do not provide a comparable quality of care.

Note: This study utilizes data from the Laguna Households Study. The Agricultural Development Council, the Philippine Population Center Foundation, the Interdisciplinary Communications Program of the Smithsonian Institution, the Rockefeller Foundation and the University of the Philippines School of Economics are thanked for their support for that study. The author was associated with the University of the Philippines School of Economics and the Rockefeller Foundation during that period. The author thanks Bryan Boulier and Robert E. Evenson for their substantial help on earlier versions of this paper and John Akin, T. Paul Schultz, and Finis Welch for later suggestions. Monica E. Yamamoto is thanked for her assistance in the preparation of this paper. Jim Brown is thanked for his comments of the final version of the paper.

The participation of the mother in market work is clearly based on a perception that the benefits of market work outweigh the costs. Whether her entrance into the market labor force is choice or necessity, it is possible that some future costs may have been poorly conceptualized or some social and private consequences may have been ignored.[1/] Some studies have shown that labor force participation may have desirable results--reduced fertility, for example.[2/] Others have shown that the deprivation of maternal inputs may adversely affect child welfare, especially aspects of child welfare which require large amounts of time.[3/] Conflicts between

1/ Economic theory would state that a woman would usually work only when the benefits outweigh the costs. However, it is easy to perceive situations where the mother's work would negatively affect child welfare. These include women who work out of economic necessity or because they desire to work, do not like children or home production, or are inefficient at home production. Only in the case where the mother's labor force participation is associated with changes in exogenous factors affecting her work decision (e.g., wage rate increases), do we expect a positive effect on child welfare.

2/ A decline in fertility associated with the mother's market labor force participation, especially with market work incompatible with childrearing, has been reported (Birdsall, 1976; Jaffe and Azum, 1960; Nibhon, 1976; Rosenzweig, 1977; Stycos and Weller, 1967). Friedl (1970) has suggested that one adaptation to the requirements of women's work among many societies is lower fertility and wider spacing of children (also Quinn, 1977). In othe words, Friedl feels we should examine the ways childcare and other traditional maternal roles are accommodated to women's market work.

3/ Fraiberg (1977) emphasizes the negative effects that the deprivation of maternal attachment can have on child behavior. Others have shown the significant effects of maternal deprivation on infant health and mental and psychomotor development (e.g., Barnes, 1976; Chavez, 1975; Klaus and Kennell, 1976; Monckeberg, 1977; Torun et al., 1975). There is disagreement on some of these issues. Bronfenbrenner (1976) for example, does not feel that childcare in a center or a home with either a mother or babysitter will affect aspects of the child's emotional development. Time-intensive activities such as breastfeeding, the preparation of vitamin A-rich vegetables, and the use of social services which require significant travel time have been shown to decline significantly when the mother works, especially if she has a market job that is incompatible with childcare (Sharman, 1976; S. Nerlove, 1974; Popkin and Solon, 1976; Popkin, 1978).

mother's market work and child welfare clearly cannot be resolved by preventing women from engaging in market activities.[4/] More detailed linkages between maternal work and child welfare must be explored and politically reasonable and economically feasible policy changes must be considered.

Using data from 34 rural barrios in Laguna, Philippines, this paper explores the effects of mother's labor force participation on their children's diets, on time devoted to preschool children, and the resultant impact on rural preschool children's nutritional status. In the first section a conceptual framework is developed for analyzing the impact of the mother's market work status on household time allocation, child dietary intake, and child nutritional status. Presentation of data from rural Filipino barrios, empirical analysis, and discussion follow.

Conceptual Framework

A household production model is used, with utility assumed to be a positive function of the nutritional status of children and other complex goods or consumables (Becker, 1965; M. Nerlove, 1974). Child nutritional status is defined according to a multivariate production function which involves such factors as childcare time, diet, genetic endowment, sanita-

[4/] It is possible that any negative relationship attributed to the mother's market work status may be incorrect. Women who engage in market production may have a negative child orientation or have less ability to develop child nutrition. Some fertility studies have shown that women with a higher commitment to market work have fewer children (Birdsall, 1976). Woolsey cites a study which concludes "that if the mother is satisfied with whatever she is doing--working at home or in the labor market--the children are likely to be better off emotionally" (Woolsey, 1977, p. 142). However, no studies examine how such work preferences affect either the preferences for child nutrition or the development of child nutrition. Also it is possible that the women who have market work compatible with childcare may select such work because of their preference for children (Brown, 1970).

tion factors, and birth weight. This production function interacts with the income and preferences of parents, various prices, and the number of children to determine the level of nutrition of each child. The number and composition of children affect the cost of raising the average level of child nutrition. Using this framework, average child nutritional status is related to children's dietary intake, childcare time, and other health factors.[5/] Two measures are selected to represent nutritional status--weight and height.

It is useful to begin by examining the determinants of the total time allocation of the mother, the father and older siblings where:

$$T_{ki} = a_{0ki} = a_{1ki}LFPM + a_{2ki}SES \qquad (1)$$

Time = time spent in activity k by person i;

k = market production time, childcare time (cc), nonchildcare home production time, or leisure;

i = mother (m), father (f), or older siblings (c);

LFPM = market labor force participation of the mother; and

SES = a vector of household socio-economic, age/sex composition, and capital variables.

5/There is a growing literature which shows that increased social stimulation and playtime may enhance the growth pattern of preschool children. Torun et al. (1975) in Guatemala have shown that increased physical activity enhances nutrition rehabilitation. Similar results have been reported by Monckeberg (1977). These results point to one possible effect of childcare time. We must note, however, that only Chavez and Martinez (1975) have looked at childcare time specifically, but their study design did not allow them to determine its separate effect on growth and development. The time data in this paper measure only a quantitative dimension of childcare.

Ordinary least squares is used to estimate this relationship.[6/]

The determinants of the average dietary intake of these preschool children are analyzed in a similar manner.

$$Diet_j = b_{0j} + b_{1j}LFPM + b_{2j}SES \qquad (2)$$

Diet = average dietary intake of preschool children and

j = protein or calories

To examine the effect of the intrahousehold substitution of time and "the market-food-for-home-time tradeoffs" on child nutritional status, the following recursive formulation is used.

$$NS = c_0 + c_1\hat{T}ime_{ccm} + c_2\hat{T}ime_{ccf} + c_3\hat{T}ime_{ccc} + c_4\hat{D}iet_{pro} + c_5\hat{D}iet_{cal} \qquad (3)$$
$$+ c_6Health$$

NS = measures of the average nutritional status of children.

$\hat{T}ime_{cci}$ = predicted variable based on equation 1 regressions.

Health = health factors which directly affect NS.

Either the formulation presented in equation 3 or a reduced form in which child nutritional status is determined by health, mother's labor force participation and socioeconomic status factors can be used to reflect what

[6/] When the total system of time allocation of a person is analyzed by using a method such as that shown in equation 1, the disturbance terms of the regressions of each of the k activities for person i can be correlated. When each of these seemingly unrelated regressions involves exactly the same variables for each of the k activities, then the use of ordinary least squares produces exactly the same explanatory variables as does a more complicated generalized linear regression model which is often used to develop efficient estimators for this case (Kmeta, 1971). I recognize that the labor force participation of the mother is determined simultaneously with the allocation of her time and most likely that of other household members. Attempts were made at developing identifiable systems in which LFPM, or the hours worked by the mother, is estimated and this predicted variable then placed in equation 1. These attempts were unsuccessful.

is viewed as a recursive relationship between the childcare time and dietary intake of these children and their nutritional status. Equation 3 is essentially a biological relationship which many may term a household production function.

The use of average childcare time, dietary intake, and nutritional status is important. Intrahousehold allocation of food and childcare time will vary as household and community relationships change. Rather than examining the impact of the mother's market work status on each child-- and having to face these intrahousehold allocation issues-- this study focuses on average child inputs and outputs.

These equations are laid out to facilitate an understanding of the impact of the mother's market status on each input and output. There are several key issues. One is the compatibility of the mother's job with childcare. One of the more interesting differences between industrialized and low-income areas may be that in the latter there is a greater prevalence of jobs that allow the working mother to be more responsive to child rearing needs. Hours may be less rigid, the job may be located in or near the house, and there may be greater possibilities for the child to accompany the mother to the work site.

Another issue is the effect of mother's market work experience and number of hours worked per week on child nutrition. Women who work fewer hours may be able to substitute both leisure and crucial home activities for market work, while those who work longer might be expected to reduce

all home activities to some extent.[7/] Mothers with more work experience should be more efficient in their use of scarce home production time than women who have engaged in market work a short time. On the other hand, the negative effects of maternal work on child nutrition could be greater if they occurred over a longer period of time. No data on maternal work history is available, so this factor cannot be examined.

The availability and quality of the substitutes for the mother's time is crucial. Siblings or older persons who have less childcare skill and/or interest in the child's welfare can have significant impact on the child's nutrition. Fraiberg (1977) feels that there are only rare occasions when the childcare substitutes in the United States provide childcare equivalent to that of the mother. In lower income areas where childcare substitutes may be more closely related to the family, it is possible that these substitutes provide higher quality childcare.

The effects of intrahousehold time substitution on child nutritional status is examined by comparing the impact of mother's labor force participation on the childcare time per child of the mothers ($\hat{a}_{iccm}$), and older siblings ($\hat{a}_{iccc}$), (the $\wedge$ symbol refers to estimated regression coefficients). In turn, in equation 3 the net effect of these time changes on child nutritional status can be determined ($\hat{c}_1\hat{T}ime_{ccm} + \hat{c}_2\hat{T}ime_{ccf} + \hat{c}_3\hat{T}ime_{ccc}$). It

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7/ It is not possible to examine the substitution between extra hours of market time of the mother and changes in the childcare time of the mother, father and older siblings because of the joint determination of these relationships and the resultant multicollinearity between the hours of market work of the mother and the SES factors. Thus mother's labor force participation is represented only by dichotomous (0-1) variables. This results in undetermined simultaneity biases. In Appendix I, regressions which eliminate this simultaneity bias with the use of the mother's wage rate--an exogenous factor--rather than labor force participation are presented.

is hypothesized that the quality of the time provided by the father and older siblings does not match that of the mother, and that the net effect of the mother's market work will be reduced child nutritional status.

The final factor which may affect the linkage between mother's labor force participation and children's nutritional status is the market-purchased food substituted for home time. (Other market-purchased goods such as child-care services are not considered in this study, as they are not important in the population studied.) The net effect of maternal market work on child-care time is compared with the effect on diet ($\hat{c}_4\hat{D}iet_{pro} + \hat{c}_5\hat{D}iet_{cal}$) to determine this food-for-time tradeoff. It is predicted that maternal market work status is associated with increased market food purchases and increased child dietary intake of calories and proteins. The nutritional status effect cannot be predicted.

Data

Data collected in a survey of 573 households in 34 barrios in the province of Laguna, Philippines are utilized (Boulier, 1977; Evenson, Popkin and Quizon, 1979). Detailed cross-sectional information was collected on economic, demographic, and nutrition factors during May-July 1975. The 34 barrios were representative of the major rural occupational groups--fishing, lowland rice farmers, diversified upland farming, and semi-urban barrios close to industrial employment. Random samples of households were selected from each barrio. The childcare time data for the larger sample were based on specific recall questions answered by the mother in each of these households.

mother's market work status is represented by a (0-1) market work variable and one which divides her market work into a three-way, no work/work some/work much, category. The proximity of the mother's work to the home is the job compatibility variable used. A second variable is also examined. Each rural job is ranked by the field interviewers as to its compatibility with childcare. Occupations which usually allowed the mother to care for the child while she worked (e.g., occupations such as laundry woman) are coded as good jobs.[9/]

Characteristics of the mother include her education level, which presumably affects her productivity in various activities; her preferences and her knowledge of these productive processes; her age, which can affect her productivity in both home and market activities; and her nutritional status, which can affect her home productivity and directly affect the nutritional status of the infant. Household capital could include the value of various home- and market-production-related assets or the presence of specific assets. The presence of electricity is used because of its potentially significant effects on time allocation, especially the time available for home production (Popkin, 1976; Herrin, 1976).

The demographic factors include the age and sex of children residing in the household in the week prior to the collection of survey data and the number of other persons living in the household (grandparents, other

9/ In addition, the effect of having a distant job which allowed breaks adequate for the mother to go home is examined for the urban sample. This factor is associated with a significant increase in the mother's childcare time.

Table 1. List of Variables Used in Regression

Dependent Variables

Hours of childcare time provided over a 7-day period by mother, father, all older siblings to preschool children.

Childcare time per preschool child.

Hours per week of nonchildcare, nonincome-earning home production time.

Hours per week of market production time, including income-earning home productions (gardening, handicrafts, etc.).

Leisure time of mother, father, older siblings (168 minus the sum of childcare, home production and market production time in previous week).

An average for all preschool children aged 1-71 months of grams of protein intake.

An average for all preschool children of calories consumed.

Preschool child average weight as a percentage of the normal weight for each child's age and sex based on international standards (Jelliffe). (The same nutritional status variables were calculated for anthropometric data collected at the time dietary and time observation data were obtained.)

Preschool child average height for age as a percentage of the height for age as a percentage of the height for the standard height for the age and sex of each child based on international standards. (The same nutritional status variables were calculated for anthropometric data collected at the time dietary and time observation data were obtained.)

Independent Variables

Market labor force participation of mother (=1 if works in market, =0 otherwise).

Mother works up to 39 hours/week = 1, =0 otherwise.

Mother works $\geq$ 40 hrs = 1, =0 otherwise.

Mother works $>$ 99 minutes and $<$ 333 minutes per day = 1 =0 otherwise.

Proximity of mother's work to home (=1 if job is in or very close to house, =0 otherwise).

Compatibility of mother's work with child care (=1 if occupation rated as usually allowing mother to take child with her, =0 otherwise).

Table 1 (cont.)

Independent Variables (cont.)

Mother's job is not close to home but allows break (=1 if job is not near home and allows breaks for mother to go home).

Formal education level of mother.

Age in years of mother.

Income per capita of household members excluding the mother (in hundreds of Philippines pesos).

Electricity (=1 if household has electricity,=0 otherwise).

Number of children aged 0-1 in household during previous week.

Number of children aged 1-6.

Number of boys aged 7-15.

Number of girls aged 7-12.

Number of girls aged 13-15.

Number of children 16-24.

Number of children 16 and over.

Number of grandparents, relatives, residents and servants living in the household.

Percentage of mother's weight in relation to the standard weight for her height based on international standards (Jelliffe).

Household has a piped water supply into the home (16% of households have this).

Predicted per capita childcare time of the mother (father) (children) based on regressions for the total sample.

Average predicted intake of protein or calories for all preschool children in household.

relatives, unrelated residents, and servants). The specific child age and sex variables used are based on previous analyses which examined some of the intrahousehold time patterns (Boulier, 1976; Popkin, 1976; Popkin, 1978). Boulier found that each additional preschool child increased childcare time of the mother and older siblings and increased the father's market time, and that older female children substitute for the father's childcare and home production time. The impact of older children on the mother's time varies with the family's age and sex composition. In general, he found that older males substitute more for the mother's market time and older girls more for the mother's home production time.

In the following empirical analysis, historical data on goods and time inputs to children or maternal work experience are not available. It is not clear how this biases the result, since it is difficult to state whether there will be greater historical variation in childcare time or dietary intake.

Empirical Analysis

1. Time Allocation

For the purpose of examining the effects of the mother's work status on household time allocation, the time of the mother, father, and older siblings (age six and above) has been divided into four categories: time devoted to the care of preschool children (childcare time) time spent in nonincome home production, time spent in income-earning work (working or market time), and leisure (defined as the residual time in the week).

Table 2 presents means for the time allocation of the mother, father

and older siblings for households of working and nonworking mothers and for mothers whose work is far from home. Note the 4-hour difference in childcare for working and nonworking mothers. Working women have much less leisure time than nonworking women and their husbands. Also, working women who engage in jobs further away from home engage in significantly less childcare. These relationships are explored more systematically in the multivariate analysis presented below.10/

Table 3 presents regressions of the determinants of the time allocation of mothers in all households. Part 1 of table 4 presents regression coefficients for the effects of the mother's work and the nearness of her job to the home on the time allocation for the mother, father, and children. In part 2 are shown coefficients for regressions which use childcare time per preschool child as the dependent variable in place of total childcare time. Tabel 5 presents some predicted values of total childcare time of house holds with working and nonworking mothers who are assumed to have the same socioeconomic and demographic characteristics.

10/ The Lee-Da Vanzo paper elsewhere in this volume reports that Malaysian mothers, fathers, and children spend about 31, 5, and 7 hours per week, respectively, in childcare.

Our Laguna recall findings are quite different. Moreover, a similar study I am conducting in 2,000 Bolivian households reports childcare time of the mothers, fathers, and older siblings of 11, 1, and 6 hours per week, respectively. The Laguna direct observation findings, which record as childcare time all primary and secondary (i.e., joint) activities, are similar to the Laguna and Bolivia recall findings. Thus the difference is not related to the exclusion here of joint childcare and other home activities. The greater time for the Malaysian fathers may reflect a tendency also reported in U.S. time studies for the father of households with better educated or working mothers to increase his childcare time. The much higher 31 hours of childcare time by the Malaysian mother, however, cannot be easily explained. It may relate to differences in child-rearing patterns although this is unlikely, as Filipino and Malaysian child-rearing patterns have been reported by some social scientists to be quite similar.

Table 2. Household Time Allocation and Mother's Work (hours per week)

Time Allocation	Mother's Participation in Market Production		Location of Mother's Job	
	None	≥ 1 hour/week	no job or job near home	job far from home
MOTHER				
childcare	12.0	8.8 [2]	10.7	7.8 [2]
non-childcare home production	40.4	42.1	42.0	39.9
market production	0	31.1	13.7	38.8 [2]
leisure [1]	115.6	86.0 [2]	103.7	85.9 [2]
FATHER				
childcare	1.0	0.4	0.6	0.7
non-childcare home production	2.7	2.8	2.7	2.9
market production	50.9	51.4	50.4	54.1
leisure [1]	113.4	113.4	115.3	114.9
OLDER SIBLINGS (total)				
childcare	2.5	4.5 [2]	4.0	3.0
non-childcare home production	12.1	16.0 [2]	13.6	17.7 [2]
market production	11.0	15.8	13.6	15.2
Average % weight for age [3]	77.2	76.1	76.8	75.4
Average % height for age [3]	90.8	90.3	90.6	90.2
Number	214	349	440	133

[1] Leisure is a residual category.

[2] T-value significant at .05 level.

[3] Percentage of child's weight or height in comparison to the weight or height of a U.S. child's 50th percentile for the same age and sex.

We examine first the effect of the mother's work status on the mother's time allocation. When the mother works, leisure time declines by almost 28 hours per week on the average. Women who work 0-39 hours average 14 hours of work per week, and those who work more than 39 hours average 60 hours of work per week. As is seen in Table 3, there is close to a 1:1 correspondence between an increase in maternal work time and the decline in maternal leisure time. The mother's childcare time declines very little in comparison. For working mothers, near jobs are associated with increased home time and reduced work time. The impact on childcare time of having a near job is small. A good job which allows the mother to be with her young children also has a small impact on her childcare time.

Changes in the mother's work status have little impact on the father's time allocation but have a large impact on the time older children provide for childcare and home production. What is surprising, however, is that children whose mothers work more than 39 hours per week provide no more childcare than do those whose mothers work less (table 4). In the case where the mothers work less than 40 hours per week, siblings' childcare time increases significantly by 2.3 hours per week, and when the mother works 40 or more hours in the week, siblings increase their child care time by 2.1 hours.

The compatibility of the mother's job is associated with a decrease in the childcare time of fathers and an increase of the childcare time of older children. One possibility is that the presence of mothers forces older children to spend more time with their siblings. In other words, according to this hypothesis, the mother who is nearby is more able to supervise the childcare time of the older children. This could further explain why a separate study of breastfeeding behavior in this same sample

Table 3. Regression: The Total Sample of Time Allocation of Rural Mothers (hours per week)

Independent Variables	Childcare	Home Production	Leisure	Market Production
Constant	9.8	52.3	108.36	8.80
Labor force participation	-1.2 (.91)	2.7 (1.32)	-27.7 (9.93)	
Education	.2 (.53)	-1.8 (2.82)	1.2 (1.40)	.7 (.96)
Age	-.2 (2.25)	-.2 (1.77)	.3 (1.92)	.3 (2.38)
Per capita income of other household members	-.03 (.68)	-.03 (.52)	.1 (1.21)	-.2 (2.20)
Electricity	.3 (.19)	2.1 (.94)	-2.9 (.94)	-1.7 (.70)
Number of children aged 0-1	10.7 (5.58)	.04 (0)	-6.5 (1.99)	-7.7 (2.29)
Number of children aged 1-6	5.3 (7.71)	2.8 (2.57)	-8.4 (5.40)	1.2 (1.02)
Number of boys aged 7-15	-.2 (.38)	.4 (.37)	.93 (.65)	-2.0 (1.80)
Number of girls aged 7-12	-.3 (.37)	-1.5 (1.07)	.7 (.03)	3.2 (2.13)
Number of girls aged 13-15	.1 (.04)	-1.6 (.76)	.3 (.08)	.3 (.11)
Number children aged 16-24	-.4 (.82)	-1.5 (1.81)	1.7 (1.46)	.3 (.34)
Number of others living in household	1.1 (1.37)	-2.1 (1.70)	.9 (.51)	-.9 (.67)
R^2	.28	.07	.24	.05
adjusted R^2	.27	.053	.22	.03
F	18.3	3.7	14.4	2.77
N	571	571	571	571

(t-values in parentheses)

Table 4. Summary: Effects of Changes in the Mother's Status on Household Time Allocations (hours per week)

	Mother				Father				Older Siblings		
1. Total Time	Childcare Time (1)	Home Production Time (2)	Market Production Time (3)	Leisure Time (4)	Childcare Time (5)	Home Production Time (6)	Production Time (7)	Leisure Time (8)	Childcare Time (9)	Market Production (10)	Home Production (11)
A. Total Household											
1. Mother's labor force participation	-1.2 (.91)	2.7 (1.32)	---	-27.7 (9.93)	-.6 (1.62)	.3 (.60)	1.4 (.48)	-.2 (.07)	2.3 (2.64)	3.9 (1.61)	2.1 (1.17)
2. Mother works up to 39 hrs.	-.8 (.6)	3.0 (1.30)	---	-14.4 (4.90)	-.6 (1.29)	.3 (.43)	.8 (.22)	-.2 (.06)	2.3 (2.30)	3.6 (1.34)	.5 (.3)
Mother works 40 hrs. or more	-1.8 (1.10)	2.3 (.9)	---	-61.6 (16.2)	-.6 (1.26)	.2 (.22)	4.6 (1.17)	-1.9 (.60)	2.1 (1.83)	2.4 (.7u)	6.1 (1.82)
B. Families with Mothers Engaged in Market Work											
3. Proximity of work to home	1.0 (.69)	3.1 (1.14)	-16.9 (5.84)	12.0 (3.03)	-.4 (1.65)	-.4 (.60)	-7.9 (1.94)	6.6 (1.60)	1.3 (1.10)	.8 (.29)	-.6 (.18)
4. Compatibility of work with childcare	.8 (.59)	4.0 (1.48)	-19.6 (7.0)	14.2 (3.63)	-.4 (3.39)	-.4 (.46)	-6.2 (1.64)	3.8 (1.08)	1.5 (1.30)	-.1 (.04)	-1.9 (.78)

2. Childcare Time Per Preschool Child

	Mother	Father	Older Siblings
A. Total Household Mother's labor force participation	3.4 (1.28)	-.3 (1.35)	1.3 (2.03)
B. Families with Mothers Engaged in Market Work Proximity of work to home	0.7 (.82)	-.1 (.85)	0.9 (1.15)

B coefficients with t-values in parentheses.

found women with compatible jobs breastfed less than other working women (Popkin, 1978). A conflicting hypothesis would be that women with compatible jobs are better able to recall the childcare time of the older siblings. In other words, measurement error might explain this effect.

An alternate way to examine this impact of the working status of mothers on childcare patterns is to compare the childcare of families with and without working mothers. In table 5, the assumption that all socioeconomic and demographic factors other than the mother's work status are the same is used to develop predicted childcare time estimates.[11/] In column 1 parts A and B the difference between the working and nonworking mothers' households' childcare patterns are highlighted. While the net effect is that children of working women receive about one less hour of childcare time, working mothers provide three less hours and their older children provide an additional two hours of childcare. When the working mother's job is near, the net impact is to provide an additional 1.8 hours of childcare time.[12/]

11/ The Chow test is used to test the difference between time allocation of the fathers, mothers, and children in households with and without working mothers. Significant differences ($p < .05$) exist for the father's and children's time allocation regressions.

12/ Unreported urban time allocation results show that women in this urban sample who work reduce their childcare time much more than working rural women. Moreover this is not compensated by the childcare of older children. Rather the fathers increase their childcare time, as, it appears, do other adult household members. An addition of other non-nuclear family household members is associated with significant 5 and 3.3 hour reductions in the mother's and father's childcare time, respectively. A near job is also more meaningful and is associated with a significant large increase in childcare time by the mother. It is difficult to explain the greater effect on childcare in urban areas when the mother works and when they have a near job. Many more of the rural women have compatible jobs. Also more rural market work would be expected to have a smaller effect on childcare. Even the rural, incompatible (far) jobs are probably less disruptive on desired childcare patterns. In the urban areas, women with a far job who have a break which allows them to return home add 17.4 hours per week to their childcare time, ceteris paribus.

Table 5. The Effects of Simulated Changes in Socioeconomic Variables on Time Allocations of Childcare in Rural Households[1/]

	Predicted Value	Mother's Work Close to Home	Infant in Household
A. Working Mothers			
Mother's Childcare Time	10.2	+1.0	+11.6
Father's Childcare Time	0.6	-0.5	+0.1
Older Siblings' Childcare Time	19.1	+1.8	+12.1
Total	19.1	+1.8	+12.1
B. Non-Working Mothers			
Mother's Childcare Time	13.0	---	+10.1
Father's Childcare Time	1.0	---	-0.9
Older Siblings Childcare Time	6.0	---	-2.8
Total	20.0	---	+6.4

[1/] These calculations assume that both samples have the mean values for the total population, no electricity, and the mother works at a job far from home. These predictions and marginal changes are based on regressions with the same independent variables as those in table 2 except that the father's equations include his education and predicted wage rate and exclude the income per capita variable.

These simulated effects presented in Table 5 are similar to the effects derived by using mother's work status and near-job dummy variables (tables 3 and 4).[13/]

2. Dietary Intake

The mother's market work status is associated with an increase of 7 percent in the consumption of calories and proteins derived from market food purchases and increased caloric and protein intake by preschool children, other things being equal. The average sample household buys about 39 percent of its caloric intake from food markets; households with working mothers purchase about 42 percent of their calories, and those with non-working mothers purchase about 35 percent.[14/]

[13]The results in table 4, part 2 indicate that the use of childcare time per preschool child as the dependent variable does not change the pattern shown in table 5.

[14]The amount of proteins purchased in households of working and those of nonworking mothers is similar. About 33 percent of the former's and 26 percent of the latter's protein consumption comes from food purchases. The results for the calorie and protein purchased is similar when multivariate analysis is used. For example,

$$\begin{array}{l}\%\ \text{calories} \\ \text{purchased}\end{array} = \underset{}{.39} + \underset{(2.5)}{.07}\text{LFPM} - \underset{(2.4)}{.02}\text{EDUCM} - \underset{(.69)}{.0001}\text{MoAGE} + \underset{(.72)}{.001}\text{YOTHCAPH} - \underset{(4.6)}{.13}\text{DECLITE} + \underset{(2.59)}{.14}\ \text{Household size}$$

$R^2 = .08$ (t-values in parentheses) $F = 8.1$

LFPM = Mother's labor force participation.
EDUCM = Mother's education
MOAGE = Mother's age
YOTHCAPH = Per capita income of other household members
DECLITE = Electricity in household.

The determinants of the caloric and protein intake of preschool children are presented in table 6 for all households and for those with working mothers. Once again, these are averages for preschool children (aged 1-71 months) in the household. In general, children of women who work have an improved daily consumption of about 145 calories and 3 grams of protein. At the same time, women with nearer jobs work less, earn less income, and their children have lower intakes of calories and protein.[15/]

The negative effect on diet of job compatibility may be related to the differential income levels associated with near jobs. Among working women's households, the per capita annual income of households of women with near jobs is about $18 less than those with far jobs. In table 4 both measures of job compatibility--near job and good job--are shown to be associated with increases in nonchildcare home production time, which includes food preparation and food marketing. A similar result was found in another study:

> This was particularly true for food preparation on which mothers working at home spent an average of 3 hours more per week than those who worked outside the home in the same barrio, and an average of 5 hours more than those who worked outside the barrio. (Jayme-Ho, p. 51.)

15/ If the preparation and feeding of calories and protein are time-intensive activities we would expect a different result. The feeding of vitamin A-rich vegetables to children appears to be a more time-intensive activity. When women in the Laguna study work, household vitamin A consumption declines significantly (Gonzalo, 1976). In Cebu, Philippines, child vitamin A intake declines as the mother works and increases among those with compatible jobs (Popkin and Solon, 1976).

Table 6. Regression: Average Daily Calorie and Protein Intake of All Preschool Children in Household

	Total Households		Working Mothers	
	Average Calorie Intake	Average Protein Intake	Average Calorie Intake	Average Protein Intake
Constant	35.16	23.2	718.7	26.9
Proximity of mother's work to home	--	--	-28.9 (.3)	-1.6 (.4)
Labor force participation of mother	145.4 (1.8)	3.1 (1.2)	--	--
Mother's education	32.6 (1.4)	-.02 (.03)	40.4 (1.4)	.3 (.3)
Mother's age	21.5 (3.2)	.3 (1.4)	22.9 (4.1)	.4 (1.2)
Per capita income of other household members	-6.0 (1.1	-.02 (.1)	-7.3 (.9)	.05 (.2)
Electricity in home	30.5 (.4)	2.4 (.9)	277.0 (2.4)	5.3 (1.3)
Number of children aged 0-1	-176.4 (1.8)	-6.6 (2.1)	-267.0 (2.0)	-8.8 (1.9)
Number of children aged 1-6	-51.0 (1.1)	-1.8 (1.2)	-102.9 (1.9)	-2.9 (1.5)
Number of boys aged 7-15	71.3 (1.8)	2.1 (1.7)	-61.1 (1.2)	-1.0 (.6)
Number of girls aged 7-12	60.0 (1.2)	2.7 (1.7)	-3.7 (.06)	2.0 (.9)
Number of girls aged 13-15	10.5 (.1)	-.8 (.3)	-6.6 (.1)	.4 (.1)
Number of children aged 16-24	-1.1 (.03)	-.9 (.6)	-38.0 (.8)	-1.8 (1.0)
Number of others living in household	-95.3 (1.8)	-2.1 (1.3)	62.8 (.6)	2.2 (.6)
R^2	.55	.37	.57	.35
Adjusted R^2	.48	.28	.46	.19
F	8.39	4.13	5.25	2.14
N	70	70	37	37

(t-values in parentheses)

In summary, the additional food preparation and other home production time that women with compatible market work have available appear to be inadequate to compensate for the food they cannot afford to buy at their lower income levels.

3. Nutritional Status

The previous sections have shown that when mothers are engaged in market work, total childcare time is slightly less, that there is an increase in childcare time of older siblings to substitute for the reduced childcare time of the mother, and that there are increases in calorie and protein consumption. Moreover, when the mother's market work is near, the childcare time of the mother and children increases and the dietary intake decreases. In table 7 the direct effects of maternal market work status on nutritional status are explored in a reduced form equation. Table 8 presents the recursive formulation (equation 3), in which the effect on nutritional status of the predicted per capita childcare time and percentage of calorie and protein RDA are examined. In table 8 the predicted per capita childcare time for the mother, father, and children in equations 1-4 are based on the per capita childcare time regressions.16/

16/ There is a conservative assumption underlying the use of these per capita childcare time variables. That is that there is no complementarity between the time inputs into each child (i.e., production is not shared). Clearly, childcare of the mother, father, and older siblings will benefit more than one child. The exact time inputs into each child fall between the total and per capita time variables. Use of per capita time increases the positive increase in the childcare time of older siblings relative to the decrease in the time of parents. When predicted total childcare time variables replace the per capita variables used in table 8, the results are similar.

Table 7. Regression: Determinants of the Nutritional Status of Preschool Children in Rural Households

	Total Households		Households with Working Mothers	
	Average Child Weight as % of Normal Weight for age	Average Child Height as % of Normal Height for age	Average Child Weight as % of Normal Weight for age	Average Child Height as % of Normal Height for age
Constant	79.6	84.8	78.5	86.8
Proximity of work to home	----	----	1.9 (.72)	-1.3 (.57)
Mother's labor force participation	-3.9 (2.02)	-1.0 (.73)	----	----
Mother's education	1.1 (1.86)	1.4 (3.11)	1.2 (1.62)	1.7 (2.58)
Mother's age	.04 (0.22)	.06 (.43)	-0.1 (.57)	-.06 (.31)
Per capita income of other household members	.04 (0.40)	.008 (.10)	-.01 (.06)	-.02 (.20)
Number of children aged 0-1	4.6 (1.98)	1.3 (.78)	3.1 (.98)	1.7 (.63)
Number of children aged 1-6	-2.5 (2.45)	-0.5 (.73)	-1.6 (1.28)	-0.7 (.62)
Number of boys aged 7-16	-0.8 (.87)	.12 (.17)	-0.4 (.31)	0.7 (.61)
Number of girls aged 7-12	-1.04 (.83)	-.70 (.78)	-0.7 (.48)	-0.7 (.52)
Number of girls aged 13-15	-1.3 (.61)	1.5 (1.01)	-0.9 (.36)	3.3 (1.55)
Number of children aged 16-24	1.9 (1.80)	0.5 (.70)	2.4 (1.95)	0.3 (.25)
Number of others in household	0.3 (.22)	0.3 (.34)	-0.9 (.55)	0.4 (.35)
Electricity in household	1.8 (.82)	2.7 (1.76)	0.8 (.28)	4.5 (2.01)
R^2	.11	.07	.08	.10
$\bar{R}^2$	.06	.03	.01	.03
F	2.55	1.71	1.17	1.39
N	269	269	166	166

(t-values in parentheses)

Table 8. Regression: Food and Time Determinants of Nutritional Status of Preschool Children in Rural Households

Independent Variable	Average Child Weight as % Normal Weight by age	Average Child Weight as % Normal Weight by age	Average Child Height as % Normal Height by age	Average Child Height as % Normal Height by age	Average Child Weight as % Normal Weight by age	Average Child Height as % Normal Height by age
Constant	56.9	58	83.18	83.05	69.2	70.7
Predicted per capita child-care time of father	0.8 (.44)	--	-0.2 (.15)	---	-.01 (0.2)	-.1 (1.02)
Predicted per capita child-care time of mother	0.4 (2.46)	0.4 (2.50)	0.3 (3.17)	0.3 (3.17)	+.01 (.66)	.04 (2.11)
Predicted per capita child-care time of children	-0.9 (4.93)	-.9 (5.11)	-0.6 (5.75)	-0.6 (5.82)	-.1 (2.2)	-.1 (1.71)
Percentage mother's weight in relation to height	+.08 (2.77)	.08 (2.76)	-.004 (.24)	-.004 (.24)	.04 (.76)	.05 (1.00)
Piped water in house	1.7 (1.17)	1.7 (1.16)	0.3 (.32)	0.3 (.32)	.47 (.20)	1.0 (.41)
Average predicted intake of calories for preschool children in household	--	--	--	--	.0004 (.05)	-.0002 (.29)
Average predicted intake of protein for preschool children in household	--	--	--	--	.04 (.11)	.04 (.94)
R^2	.08	.08	.08	.08	.07	.07
Adjusted R^2	.07	.07	.07	.07	.01	.01
F	7.4	9.2	7.0	8.7	.93	.90
N	269	269	269	269	68	68

(t-values in parentheses)

The reduced form results indicate that adverse intrahousehold time and food-for-time tradeoffs occur when the mother works in market production. In table 7, the average percentage weight for age and percentage height for age is lower among children of working mothers. Also the children of working women with near jobs have better nutritional status.

In table 8, the effect of the intrahousehold time substitutions between the working mother and the father and other siblings is shown to be negative. Multiplying the change in time associated with the market status of the mother (see table 5) times the regression coefficients shows a reduction of 2 percent and 6.9 percent in the weight for age and height for age of the average child when the mother works.[17/]

The net impact of the food-for-time tradeoff on child nutritional status is negative as would be expected from table 8.' When the mother works (see table 6), the impact of increased calories (+145.4) and proteins (+3.1) on percentage of weight for age is +.18 percent (table 8, column 5). The negative time effect of -1.29 percent weight for age for this same subsample more than offsets this positive diet effect for a net reduction of 1.11 percent weight for age. Children of mothers who work only 99-333 minutes per day have a smaller reduction in nutritional status of -.70 percent weight for age. There is a larger protein increase and smaller childcare

17/ The interpretation of these results is not straightforward. The inverse childcare time of the older siblings associated with nutritional status may reflect some unrelated demographic relationships. For example, more older children could force the mother to work and/or lower per capita household resources. The negative coefficient for siblings' childcare time could catch this resource effect. Or it could reflect intrahousehold food allocation which goes to older children and reduces the average consumption of preschool children.

time decrease associated with this level of work effort.

The results of the negative diet-for-time tradeoff (columns 5-6 of table 8) must be treated very cautiously as the percentage of variance explained is very low and few of the coefficients are significant. On the other hand, most of the per capita childcare time coefficients in equations 1-4 are significant. The covariance structure of these equations are quite stable, as is indicated when the father's per capita time variable is excluded from the regressions for equations 2 and 4.

Finally, the question "So What?" must be asked. Is a drop of 2-6 percent of weight or height for age meaningful? For preschool children who are severely malnourished, such a reduction is significant. In about 27 percent of the households, the average weight for age is less than 69 percent of normal. There is a small increase in the probability that children are in this severely malnourished category when the mother works and a much lower probability that children are in this category when the mother has a compatible job.[18/]

Discussion

These results must be interpreted cautiously because of the exploratory nature of this analysis. The results indicate a potentially negative

18/ In unreported regressions, the impact of mother's labor force participation on the probability of being in two severe malnutrition categories (third degree or percentage of weight for age $\leq$ 50th percentile and percentage of weight for age $\leq$ 69th percentile) are estimated. There is a 4 percent increase in the probability that children are in these categories, while near jobs are associated with a large and significant (6 percent third degree and 16 per cent percentage of weight for age $\leq$ 69 reduction in the probability of being severely malnourished.

association between the mother's market work status and child welfare. The time effects, which appear more conclusive, may indicate an adverse impact on the emotional and intellectual development of the child. The tempering effect of market work compatible with childcare on this linkage is also important to note.

Drawbacks inherent in this analysis should be mentioned. First, the effects of changes in the mother's work role on child welfare are best viewed within a broader household production model. A more complete analysis, which includes the effects of work role changes on the number and pacing of children and other dimensions of child welfare is needed. Second, we must learn more about the mother's work decision. We know very little about the determinants of her choices or about the constraints she faces. Third, it is possible that the mother's labor force participation regression coefficients are biased. When her wage rate is substituted for labor force participation, there is a significant reduction in preschool child nutritional status associated with maternal wage rate increases among children of mothers with lower wage rates. (Appendix I).

An additional need is to consider more carefully the types of health, nutrition, and socioeconomic factors that should be examined in order to understand more about the determinants of child health and nutritional status and the way changes in the role of the mother can affect these relationships. Our understanding of these factors is at a relatively primitive level. Such issues include the impact of home management and childcare skills of the mother and siblings and home assets which can indirectly, as well as directly, affect child welfare through their effects on home productivity. For example, a large proportion of the households in low-

income countries do not have access to potable water (note the effect of piped water supply in table 8) or sanitary kitchen facilities (e.g., Briscoe, 1978; Kawata, 1978).

Finally, more careful attention should be given to the ways community factors,such as changes in labor market conditions to provide more compatible work (split work shifts, for example), affect child welfare. Not only can health and childcare facilities and professionals directly affect the child's health, but they may also have more subtle effects on household attitudes and skills related to child welfare. The need to consider such factors more carefully should be underscored.

A significant proportion of the women in low-income nations engage in market work. This potential conflict between women's market activities outside the household and aspects of home production must be recognized. Moreover, increases in the factors that adversely affect child welfare may amplify this problem in the future. For example, the greater availability of public education, increased industrialization, and better access to agricultural technology may increase the demand for adolescents to be in school and have negative impacts on childcare arrangements (Whiting, 1977). The increased potential market productivity of better educated women may decrease their participation in time-intensive childrearing activities. Moreover, this author expects that an increased percentage of women will

be engaged in incompatible market work.[19] Finally, the rate of growth of urban areas will remain greater than those of rural ones and it may be more difficult to arrange high-quality childcare in urban areas (e.g., Whiting, 1977).

[19]The probability of the mother's having a compatible job (near job) is regressed on the household composition variables and on either the income of others in the household or the value of the mother's and father's time. Among urban women, there is a positive association between compatible jobs and increased household income of others. Furthermore, there is a large and significant inverse association between the probability of having a compatible job and the value of the mother's time. In the urban areas, only the presence of infants enhances the probability that a woman would have a compatible job. In the rural sample, the income and value of time effects are small but the presence of boys aged 7-15, infants, and preschool children aged 1-6 are associated with greater probabilities of mothers having compatible jobs.

Appendix I: Effect of Changes in the Mother's Market Value of Time

The decision of the mother to work is often affected by the same factors which affect family time allocation and child welfare. Consequently the coefficients of the mother's labor force participation variable in the multivariate analyses presented in the text may be biased. Use of the mother's wage rate minimizes this problem. This wage rate variable is determined both by factors endogenous to the mother (e.g., her education and work experience) and by exogenous labor market conditions.

We predict that an increased wage rate would reduce the mother's home production and increase her market production as long as her substitution effect is greater than her income effect. We split the mother's wage rate into two variables for mothers with lower and higher wage rates in Appendix I, table I. From this we note that wage increases for mothers with lower wage rates increase their market production and reduce their leisure and home production. Both the husband and children substitute their home production time for the mother's. When the wage rate of the mother increases among higher wage rate women there is a shift back to home production and leisure time is not reduced. This means that children of mothers with lower wage rates receive more paternal and sibling childcare time and less maternal childcare time when the mother's wage rate increases. For children of mothers with higher wage rates, childcare time increases when her wage rate increases.

The child nutritional status effect of wage rate increases among women with lower wage rates is negative. In Appendix I, table 2 we show that this effect appears strongest among children aged 1-35 months (e.g.,

in column 3, note the -8.9 coefficient). For children of mothers with high wage rates, there is a very slight nutrition effect. The effect of increases of low maternal wage rates was especially significant in increasing the probability that preschool children would have height for age below the 69th percentile (unreported regressions).

APPENDIX I

Table 1. Summary: Effects of Changes in Mother's Wage Rate and Job Location On Household Time Allocation

	Mother				Father				Children		
	Child-care (1)	Home Production (2)	Market Production (3)	Leisure (4)	Child-care (5)	Home Production (6)	Market Production (7)	Leisure (8)	Child-care (9)	Market Production (10)	Home Production (11)
A. TOTAL HOUSEHOLD											
1. MHRWAGEM	-1.9 (.73)	-4.6 (1.07)	43.3 (10.04)	-31.6 (4.95)	-0.4 (.53)	2.4 (1.87)	-11.4 (1.84)	8.4 (1.47)	1.0 (.86)	4.4 (.79)	4.1 (.9
2. MHRWAGEH	0.1 (.87)	0.3 (1.64)	-0.2 (1.25)	-0.2 (.87)	-0.02 (.67)	.01 (.31)	-.01 (.05)	.05 (.22)	0.2 (2.4)	0.3(1.28)	0.2 (1.
B. FAMILIES WITH MOTHERS ENGAGED IN MARKET WORK (LFPM = 1)											
3. NEARJOB	1.1 (.75)	2.7 (1.01)	-15.7 (5.57)	11.1 (2.80)	-0.4(1.46)	-0.3 (.36)	-8.3 (2.06)	5.06 (1.40)	1.3 (.84)	-3.1(1.01)	-3.1 (1.(

where: MHRWAGEM = 0 if mother does not work in market or has a high wage rate per hour, =1 if mother has low wage rate

MHRWAGEH = 0 if mother does not work or has a low wage rate, =1 if mother has a high wage rate

1 the regressions used here are the same as those reported in Table 3 except that the father's and children's wage rates replace the per capita household income variable.

(B coefficients with t-values in parentheses)

APPENDIX I

Table 2. Regressions: Determinants of the Nutritional Status of Preschool Children in Rural Households

	TOTAL HOUSEHOLDS				WORKING MOTHERS			
	AVE%WTAGE (1-71 mo)	AVE%HTAGE (1-71 mo)	AVE%WTAGE (1-35 mo)	AVE%HTAGE (1-35 mo)	AVE%WTAGE (1-71 mo)	AVE%HTAGE (1-71 mo)	AVE%WTAGE (1-35 mo)	AVE%HTAGE (1-35 mo)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CONSTANT	76.7	86.8	54.8	79.6	76.7	90.1	63.2	97.3
MHRWAGEM	-2.9 (.71)	-3.8 (2.7)	-8.9 (.97)	-4.0 (.87)	-1.6 (.34)	-3.1 (1.10)	-1.5 (.16)	-2.6 (.51)
MHRWAGEH	-.04 (.41)	-.02 (.25)	-0.2 (.94)	-.04 (.46)	.01 (.05)	-.01 (.08)	-0.1 (.71)	-.01 (.13)
Mother's education	1.0 (1.53)	0.9 (2.47)	1.6 (1.22)	1.2 (1.83)	1.1 (1.36)	9.0 (1.79)	1.8 (1.27)	0.9 (1.13)
Mother's age	.04 (.20)	0.1 (1.26)	0.4 (1.08)	0.4 (1.85)	-0.1 (.64)	.05 (.34)	.05 (.10)	.006 (.03)
Father's hourly wage rate	-.08 (.20)	0.2 (.82)	-0.4 (.26)	0.5 (.62)	-0.2 (.36)	0.2 (.61)	-1.2 (.66)	-0.6 (.58)
Electricity	1.6 (.71)	1.6 (1.28)	1.8 (.41)	2.8 (1.29)	0.4 (.14)	2.7 (1.58)	0.4 (.08)	4.2 (1.48)
Number of Children								
aged 0-1	4.6 (1.92)	1.2 (.89)	8.5 (2.01)	3.5 (1.68)	2.5 (.77)	1.3 (.6[illegible])	6.3 (1.23)	2.2 (.76)
aged 1-6	-2.4 (2.23)	-1.0 (1.70)	-2.4 (1.23)	-2.0 (1.99)	-1.3 (1.0)	-1.1 (1.36)	-0.09 (.04)	-2.1 (1.67)
aged 7-15	-1.0 (1.34)	-0.4 (.87)	-1.3 (.99)	-0.3 (.50)	-0.7 (.63)	-0.3 (.41)	-1.7 (1.00)	-.03 (.03)
aged 16-24	1.9 (1.77)	0.3 (.52)	3.0 (1.46)	0.9 (.84)	2.6 (2.05)	-0.2 (.27)	3.9 (1.75)	2.0 (1.63)
OTHERS	0.1 (.08)	-0.7 (.97)	-2.04 (.69)	-1.7 (1.16)	-1.4 (.80)	-1.4 (1.34)	-2.8 (.86)	-0.7 (.35)
R^2	.09	.08	.14	.16	.08	.08	.18	.16
Adjusted R^2	.04	.03	.05	.07	-.005	.004	.02	.001
F	1.96	1.73	1.63	1.88	.94	1.05	1.16	1.01
N	264	264	132	132	161	161	81	81

(t-values in parentheses)

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Women's Access to Schooling and the Value Added of the Educational System: An Application to Higher Education

Marcelo Selowsky
Development Research Center
World Bank

There are two widely accepted notions in the present human capital erature. 1. It is recognized that early traits or innate abilities of indi do have an independent influence on future earnings and productivity. The measurement of these traits has become particularly important in attempts to isolate the net impact of education, given the presumption that the amount of schooling itself is influenced by the level of these abilities.[1/] 2. The semi arithmetic functional form of the earnings function (relating earnings to human capital attributes, schooling, early abilities, experience, etc.) is the most plausible specification for this function from both a theoretical and empirical point of view.[2/]

In an earlier work (Piñera and Selowsky, 1976), it was pointed out that the acceptance of notions outlined above has profound implications for what might be called "the optimal allocation of education across individuals" the semi-log function implies complementarity between early ability and schooling, (i.e., the effect of schooling on earnings will be larger the higher the level of early ability of the individual).

1/ If years of schooling and early abilities are positively correlated, exclusion of the latter will yield positively biased estimates of the schooling coefficient.

2/ Mincer (1974), using a schooling investment model, provided a theoretical justification for this semi-log functional form. Heckman and Polacheck (1974) empirically verified this hypothesis by using the Box and Cox (1964) transformation to test for the correct functional form. Working with several sets of data they concluded that, under the normality assumption, the semi-log form was the most appropriate simple transformation to be used in the specification of the earnings function. Neither Mincer's theoretica argument nor Heckman and Polacheck's empirical test explicitly dealt with the preschool ability variable. However, Griliches (1970) concluded that the semi-log form fitted the data best on the "standard error in comparable units criterion."

Note: The views expressed are those of the author and do not necessarily reflect those of the World Bank.

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CHAPTER 2: WOMEN AND WANT

Women's Access to Schooling and the Value Added of the Educational System: An Application to Higher Education
Marcelo Selowsky

Sex Differences in the Effects of Nutrition and Social Environment on Mental Development in Rural Guatemala
Patricia L. Engle

Home Investment in Children in the Rural Philippines
Emeline Realubit Navera

Nutritional Stress and Economic Responsibility: A Study of Nigerian Women
Judith A. Harrington

The implications of the above are quite important. An optimal allocation of educational resources across individuals would require a selection criteria--who receives how much schooling--based on these abilities only. Any system where the level of schooling is determined by factors other than ability--such as the level of family income or the sex of the student--induces a misallocation of existing educational resources. This misallocation is the difference between the value added of the present educational system and the one resulting from a system where students at each level are selected according to their abilities only.

In the early work, Piñera and I addressed the misallocation that results from a selection criteria based on family income. Here we compute the misallocation resulting from a selection influenced by the sex of students. This will be illustrated by using higher education as the case study.

The educational system under consideration is characterized as follows:

a) the female participation in the educational system is lower than the male participation, and the gap increases at higher levels of schooling;

b) the female-male ratio among students applying for admission to higher education is lower than the ratio among students graduating from secondary schools; and,

c) in higher education the excess of applicants over vacancies is rationed according to the level of abilities of the applicants, i.e., ability is the selection criteria.

The paper derives the change in the discounted present value of (a given size of) higher education for two types of increments in female participation: A marginal change, namely the ratio females-males applying for higher education becomes equal to the ratio among the students graduating from secondary schools. A more radical change where, in addition, the participation of females in secondary education becomes equal to the male participation.

Framework

1. The Earnings Function and the Value Added of Education.

Assume the earnings function relating wages (W) with years of schooling (S) and early ability (A) can be written as:

$$(1) \quad LnW = a + bS + cA$$

Let us assume for the moment that this function holds for males as well as females (i.e., the coefficients a, b, and c are independent of the sex of the individual).

Under the above specification, the marginal contribution of schooling becomes:

$$(2) \quad \frac{\partial W}{\partial S} = be^{a + bS + cA} = bW(A)$$

Namely the contribution depends on the level of early ability of the individual.

The net present discounted value of one additional year of schooling can be written as:

$$(3)\quad NPV = \frac{W_1 - W_o}{r} - (W_o + K)$$

where W_1 and W_o are the wages for individuals with S and (S-1) years of schooling, K represents the direct yearly cost of schooling (teachers plus capital costs), and r the discount rate.

$$(4)\quad NPV = \left\{\frac{(W_1/W_o) - 1}{r} - (1 + k)\right\} W_o \qquad k = \frac{K}{W_o}$$

$$(5)\quad NPV = \left\{\frac{b}{r} - (1 + k)\right\} W_o$$

The change in NPV when the level of ability of the student increases can be obtained by differentiating expression (3) with respect to A.

$$(6)\quad \partial\, NPV = \left[\frac{\frac{\partial W_1}{\partial A} - \frac{\partial W_o}{\partial A}}{r} - \frac{\partial W_o}{\partial A}\right] dA$$

$$(7)\quad \partial\, NPV = \left[\frac{\frac{\partial W_1}{\partial A}\frac{W_1}{W_1}\frac{1}{W_o} - \frac{\partial W_o}{\partial A}\frac{1}{W_o}}{r} - \frac{\partial W_o}{\partial A}\frac{1}{W_o}\right] W_o\, dA$$

The percentage change in wages due to an increase in the level of ability is equal to:

$$(8)\quad \frac{\partial W_1}{\partial A}\frac{1}{W_1} = \frac{\partial W_o}{\partial A}\frac{1}{W_o} = c$$

allowing (7) to be written as:

$$(9) \quad \partial NPV = \left(\frac{b}{r} - 1\right) W_o \, cdA$$

Defining as Δ the percentage of change in the net present value resulting from a change in A:

$$(10) \quad \Delta = \frac{\partial NPV}{NPV} = \frac{\left(\frac{b}{r} - 1\right) W_o \, cdA}{\left\{\frac{b}{r} - (1 + k)\right\} W_o} = \frac{cdA}{1 - k \frac{1}{\left(\frac{b}{r} - 1\right)}}$$

In order for (10) to be positive, the condition $\frac{b}{r} > (1 + k)$ must hold. This condition implies, as can be seen from (5), a positive initial net present value of education.

If $k = 0$ (forgone income is the only cost of schooling) the value of Δ becomes equal to cdA, and the percentage change in NPV is equal to the percentage change in wages resulting from a change in the level of ability. If $k > 0$, the value of Δ will be larger than cdA; the reason is that the change in abilities only affects a fraction of the costs of schooling, namely the forgone income component. The larger k, the higher the value of Δ; a higher k tends to widen the gap between the percentage change in gross benefits and the change in cost since dA does not affect the K component of costs.

2. Increasing the participation of women in higher education. Effects on the mean value of A of graduating students.

i) In most developing countries there is a clear excess demand for higher education (i.e., the number of vacancies are substantially smaller than the number of students applying for admission). Several types of examinations and tests are usually used to select among the candidates.

Let us assume that in the absence of loans for education, a fraction of the students graduating from higher education could finance their higher

education (basically their forgone income) if admitted. Denoting M and F the number of male and females graduating from secondary schooling we can define the potential candidates as:

$$(11) \quad N_p = \gamma M + \gamma F$$

Suppose, however, that only a fraction Π of all the potential γF females candidates presently do apply for higher education. The present number of candidates becomes, therefore:

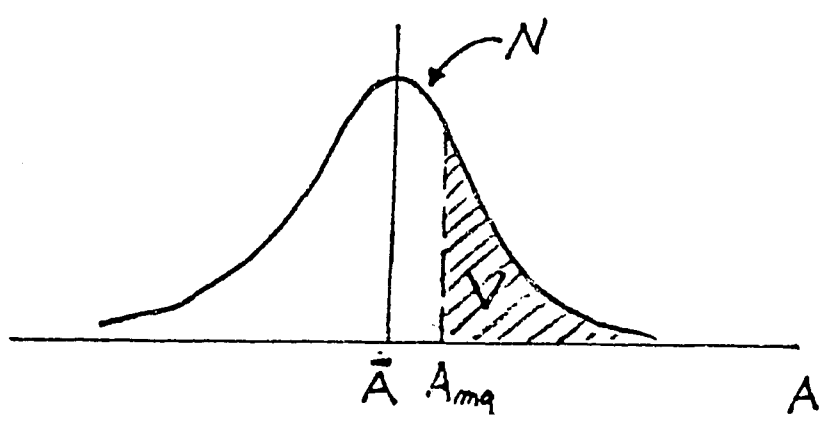
$$(12) \quad N = \gamma M + \Pi\gamma F$$

The value $(1 - \Pi)$ is the "pure participation deficit" of females, net of the "lack of family income" effect--i.e., income is not a constraint determining the value of $(1 - \Pi)$.

There are several reasons for this participation deficit, depending on the country and culture, which we will not discuss here. The only reason we are explicitly leaving out here is a differential earnings function for females; in other words, we exclude the possibility of $(1 - \Pi)$ being the result of a rational choice based on a "pure" present value calculation if, for a given level of schooling and ability, females expect a lower economic return than males.

ii) If A is a random variable, normally distributed, we can draw a distribution of N according to A as shown in figure 1.

Figure 1



Denote as $\bar{A}$ the mean expected level of ability of the N candidates. If there are only V vacancies (V< N) and the selection tests do measure A, the last (or marginal) student selected will have a level of ability equal to A_{mg}. The mean expected level of ability of the accepted students is larger than A_{mg} and depends on a) the shape (standard deviation) of the normal distribution of A; and b) the existing ratio $v = \frac{V}{N}$ --the smaller this ratio the higher the mean ability of the selected students.

If males and females have the same distribution of A the ratio of females to males among the selected students will be equal to ($\Pi F/M$), i.e. the ratio among secondary school graduates corrected by the "participation" rate of females.

What will be the effect on the mean level of ability of the selected students if $\Pi = 1$--that is, if all potential female candidates do apply for admission to higher education? The effect will depend on how the ratio of applican to existing vacancies changes when the selection is now undertaken from the larger pool N_p.

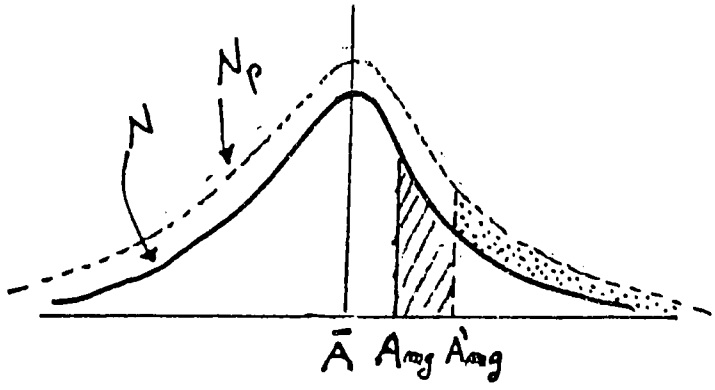
Denoting the new ratio as $v' = \frac{V}{N_p}$ we can write:

$$(13) \quad \frac{v'}{v} = \frac{V/N_p}{V/N} = \frac{\gamma[M + \Pi F]}{\gamma[M + F]}$$

$$(14) \quad v' = \left[\frac{1 + \Pi f}{1 + f}\right] v \quad \text{where} \quad f = F/M$$

Figure 2 shows graphically the effect of a larger base of students, N_p, applying to the given number of vacancies V; the marginal student accepted has a level of ability equal to $A'_{mg} > A_{mg}$. Clearly the mean level of A of the accepted students has gone up.

Figure 2



The shaded area of Figure 2 shows those students who previously were admitted but now are excluded from the selection. Their sex composition is equal to Πf (i.e., equal to the sex composition of the students who previously applied for admission). These students are now replaced by the new females now applying who are admitted, shown in Figure 2 by the dotted area.

iii) In the earlier analysis, we explore the effect of making $\Pi = 1$ for all potential female candidates--i.e., <u>taking as given the present share of females</u> graduating from secondary schools, f. Assume we are interested in the effect of a long-run (more radical) educational reform that in addition to making $\Pi = 1$ would equalize the number of females and males in secondary schools, $f = 1$. In this case, the new value of v becomes v^* :

$$(15) \quad \frac{v^*}{v} = \frac{V/N^*_p}{V/N} = \frac{N}{N^*_p} \qquad \text{where} \quad N^*_p = \gamma 2M$$

$$(16) \quad v^* = \left[\frac{M + \Pi F}{2M}\right] v = \left(\frac{1 + \Pi f}{2}\right) v$$

To the extent that $f < 1$, the value of v^* will be smaller than v' and A^*_{mg} will be larger than A'_{mg} and so the mean ability of the selected students will be higher.

iv) In order to compute the change in the mean level of ability of the selected students, let us define:

$$(17) \quad (dA)' = \hat{A}' - \hat{A}$$

$$(18) \quad (dA)^* = \hat{A}^* - \hat{A}$$

where:

Mean level of ability of accepted students.	Status of the educational system.
$\hat{A}$	present system, $\Pi < 1$
$\hat{A}'$	$\Pi = 1$, holding f constant
$\hat{A}^*$	$\Pi = 1$; making f = 1

In order to compute $\hat{A}$, $\hat{A}'$ and $\hat{A}^*$ we need first, to compute A_{mg}, A'_{mg} and A^*_{mg} consistent with v, v' and v^*. Having obtained the ability of the marginal student, we can then derive the $\hat{A}$ s, the mean ability of the accepted students.

The value for the marginal student is obtained by the conditions:

$$(19) \quad \int_{A_{mg}}^{\infty} F(A)\, dA = v$$

$$(20) \quad \int_{A'_{mg}}^{\infty} F(A)\, dA = v'$$

$$(21) \quad \int_{A^*_{mg}}^{\infty} F(A)\, dA = v^*$$

where $F(A)$ is the normal density function with mean $\bar{A}$ and standard deviation σ. Having obtained A_{mg}, A'_{mg} and A^*_{mg} the mean for the selected students becomes:

$$(22) \quad \hat{A} = \frac{1}{v} \int_{A_{mg}}^{\infty} A\, F(A)\, dA$$

$$(23) \quad \hat{A}' = \frac{1}{v'} \int_{A'_{mg}}^{\infty} A\, F(A)\, dA$$

$$(24) \quad A^* = \frac{1}{v^*} \int_{A^*_{mg}}^{\infty} A\, F(A)\, dA$$

Empirical Results

The computation of Δ can be decomposed into three stages: 1) the computation of dA, the change in mean abilities resulting from a "marginal" ($\Pi = 1$) or "full" increased participation of females ($\Pi = 1$, $f = 1$); 2) setting the value of c, or the effect of ability on log of earnings; 3) the computation of the $[1 - k/(b/r - 1)]^{-1}$ factor, adjusting for the fact that a fraction of the costs of schooling are not affected by dA.

(a) Computing $(dA)'$ and $(dA)^*$:

The first column of Table 1 shows values for Πf and f for regional country groupings ranked according to the value of Πf. The value of Πf is derived from Appendix Table 1, assuming that Π is equal to the ratio

females to males enrolled in higher education. The value of f, the ratio of females graduating from secondary education, is assumed to be equal to the ratio of females enrolled in secondary education.

The second column of Table 1 shows the values of v, v' and v^*. Two alternative initial values of v are used: 2/3 and 3/4, derived from Piñera and Selowsky (1976).

The third column shows the values for $\hat{A}$, $\hat{A}'$ and $\hat{A}^*$. In deriving these values it is assumed that the normal distribution of $\hat{A}$ of the applicants has a mean $\bar{A} = 100$ and a standard deviation of 15. This relationship between mean and standard deviation is supported by most studies dealing with the distribution of IQ in the population.

The fourth column derives the values for $(dA)'$ and $(dA)^*$: the value of $(dA)'$ ranges from 0.9 to 3.7 for Group III in Asia. The value of $(dA)^*$ is much larger, a result of a much larger number of females now applying to higher education; the value ranges from 3.7 to 8.2, around three times as large as $(dA)'$.

The value of $(dA)'$ depends basically on the absolute deviation of Πf from f. Africa I has the smallest Πf, but it also has the smallest f. Asia III has one of the biggest Πf, but f is large enough so as to make this deviation the largest of all groups. The value of $(dA)^*$ depends heavily on how far is f from 1; Africa I and Asia I have the smallest values of f; a long run reform making the number of females graduating from secondary schools equal to the number of males would have a strong effect on $\hat{A}$.

Changes in mean abilities resulting from a "marginal" ($\Pi f \rightarrow f$) and a "full" increase in the participation ($\Pi f \rightarrow 1$) of females in higher education.

	Πf (percentages)	f (percentages)	v	v'	v*	$\hat{A}$	$\hat{A}'$	$\hat{A}^*$	(dA)'	(dA)*
AFRICA										
I	7.8	20.8	66	59	36	108.2	110.0	116.0	1.8	7.8
			75	67	40	106.3	108.0	114.5	1.7	8.2
II	15.8	30.3	66	59	38	108.2	110.0	115.0	1.8	6.8
			75	67	43	106.3	108.0	113.9	1.7	7.6
III	23.5	32.8	66	61	41	108.2	109.5	114.2	1.3	6.0
			75	70	46	106.3	107.4	113.0	1.1	6.7
IV	41.0	49.0	66	62	46	108.2	109.3	113.0	1.1	4.8
			75	71	53	106.3	107.2	111.2	0.9	4.9
L. AMERICA										
I	25.0	48.0	66	56	41	108.2	110.5	114.2	2.3	6.0
			75	63	47	106.3	109.1	112.8	2.8	6.5
II	33.2	47.2	66	60	44	108.2	109.7	113.4	1.5	5.2
			75	69	50	106.3	107.6	112.1	1.3	5.8
III	45.2	51.8	66	63	48	108.2	109.1	112.0	0.9	3.8
			75	72	54	106.3	107.0	110.0	0.7	3.7
ASIA										
I	12.0	19.0	66	62	37	108.2	109.3	115.7	1.1	7.5
			75	71	42	106.3	107.2	114.3	0.9	8.0
II	25.4	32.3	66	62	41	108.2	109.3	114.2	1.1	6.0
			75	71	47	106.3	107.2	112.8	0.9	6.5
III	33.0	68.5	66	52	44	108.2	111.5	113.4	3.3	5.2
			75	59	50	106.3	110.0	112.1	3.7	5.8

Source: Values for Πf and f from Appendix Table 1.

(b) The value of c

Three basic values for c, estimated in the United States for individu with higher education, can be found in the literature: a value equal to 0.0132 from Rogers' sample; a value of 0.011 from Husen's sample 1; and a value of 0.0086 from the NBER - Thorndike sample. We will use a value of 0.01 for our calculations.[1/]

(c) The value of $[1 - k/(b/r - 1)]^{-1}$

In calibrating the value of this coefficient, we can use data on internal rates of return to higher education, by now available for several developing countries. The internal rate of return to one additional year of schooling can be written as:

$$(25) \quad \rho = \frac{W_1 - W_o}{W_o + K} = \frac{\left(W_1/W_o\right) - 1}{1 + k} = \frac{b}{1 + k}$$

Solving for b and substituting in the expression for Δ we get:

$$(26) \quad \Delta = \left[\frac{1}{1 - \frac{k}{(\rho/r)(1 + k) - 1}}\right] cdA$$

The value of the coefficient is now expressed in terms of the interna rate of return (ρ), the discount rate (r), and the value of k. If $\rho = r$ the value of Δ tends to infinity given that the initial present value of schooling becomes zero.

Table 2 shows data on ρ and k for developing countries out of Psacharopoulos' (1973) survey. Except for Mexico and Venezuela, the value of ρ ranges between 8 and 17 percent. The value of k ranges between 0.50 and 4.00.

1/ These figures are as reported in Hause (1972). See also Piñera and Selowsky (1976), Table 8.

TABLE 2

Higher Education: Internal Rate of Return And Value of k for Selected Countries

	Rates of Return (Percentages)	k
Mexico	23.0	.50
Venezuela	23.0	--
Colombia	8.0	.90
Chile	12.2	1.00
Brazil	14.5	--
Greece	8.0	--
Turkey	8.5	--
Malaysia	10.7	4.1
Singapore	14.6	--
India	12.7	1.1
Phillipines	11.0	--
Thailand	11.0	--
Nigeria	17.0	2.6
Ghana	16.5	3.1
Kenya	8.8	3.3

MEAN 13.3

Source: Psacharopoulos (1973).

Table 3 shows the value of Δ for different values of ρ and k given a discount rate of 0.10 . The results are sensitive to k but, in particular, they are extremely sensitive to the (ρ/r) ratio. This is quite important for the problem in question.

The value of Δ becomes particularly large and sensitive to (ρ/r) when this ratio becomes close to one (i.e., the internal rate of return becomes close to the relevant discount rate). What is interesting is that this is precisely the case observed for higher education in most countries.

Internal rates of return to higher education are, for most countries, substantially lower than for other schooling levels and quite close to what is usually considered the discount rate or social cost of capital in those countries. The mean internal rate for higher education in the countries of Table 2 is 13.3 percent; for the same countries the mean rate for primary and secondary education is 20.0 percent and 16.7 percent. This suggests that the value of (ρ/r) is much closer to one in the case of higher education (i.e., a higher participation of women would yield a larger value of Δ in the case of higher education).

(d) Values for Δ :

Tables 4 and 5 show values for Δ for the two types of increase participation of females in higher education. For the "marginal" increase we have used $(dA)' = 1, 2, 3$, covering most of the range of values of Table 1. For $(dA)^*$ we have used 4, 6 and 8.

By using the mid value $\rho = .12$ and a range of k between 1 and 2 the value of Δ for the "marginal" increase ranges from 3.5 to 12.9 percent, depending on the value of (dA). If we use a range of ρ between .11 and .15, the value of Δ fluctuates between 2 and 25.5 percent.

The results for a full participation have less of a variation since (dA)* has a smaller (percentage) range than (dA)'. For $\rho = .12$ and $k = 1, 2$, Δ ranges from 14 to 34.4 percent. Using the three values of ρ we obtain a range between 8 and 61.6 percent.

(e) Possible extensions:

The earlier analysis assumes the earnings function to be equal for males and females. If the earnings (productivity) function is not the same, the technique presented here allows for the computation of what might be called the "optimal" participation rate. This optimal participation rate can then be compared with the present participation.

Assume the earnings function differs in the intercept a, where a_f and a_m is the intercept for females and males, respectively. Assume further that society accepts the proposition $a_f < a_m$. Given that the optimal composition of accepted students requires the equalization of wages for the marginal male and female student accepted, the difference in intercept will have to be compensated by differences in A. The value of A for the marginal male accepted will be lower than the one for the marginal female. This condition will take place by accepting a share of females smaller than their share among the applying candidates.[2/]

[2/] Denote: $\text{Ln } W_f = a_f + bS + c\,A_f$

$$\text{Ln } W_m = a_m + bS + c\,A_m$$

The earnings of the marginal female and marginal male accepted (according to the level of A) must be equal:

$$\log W_f = \log W_m$$

this will hold for:

$$(A_f - A_m) = \frac{a_m - a_f}{c}$$

if $a_m > a_f$, the value of A_f of the marginal female will have to be larger than the value of A_m for the marginal male. If males and females applying to higher education have the same distribution of abilities the above condition will hold by accepting a smaller share of females than their share among the pool of candidates.

Obviously, the acceptance of the $a_f < a_m$ condition, crucial for this analysis, is philosophically quite debatable and a different subject we do not address here.

TABLE 3

Value of Δ Expressed In Terms of cdA ($r = 0.10$)[1/]

	Internal Rate of Return (ρ)				
	$\rho = .10$	$\rho = .11$	$\rho = .12$	$\rho = .15$	$\rho = .20$
$k = 1/2$	∞ [2/]	4.33 cdA	2.67 cdA	1.67 cdA	1.33 cdA
$k = 1.0$		6.00 cdA	3.50 cdA	2.00 cdA	1.50 cdA
$k = 2.0$		7.67 cdA	4.33 cdA	2.33 cdA	1.67 cdA
$k = 3.0$		8.50 cdA	4.75 cdA	2.50 cdA	1.75 cdA

1/The internal rate of return to one additional year of schooling is equal to ρ :

$$\rho = \frac{W_1 - W_o}{W_o + K} = \frac{W_1/W_o - 1}{1 + k} = \frac{b}{1 + k}$$

Solving for b and substituting in the expression for Δ we get:

$$\Delta = \frac{1}{1 - \frac{k}{(\rho/r)(1 + k) - 1}} \text{ cdA}$$

2/Since $\rho = r$ the initial present value of schooling tends to zero.

TABLE 4

Values of Δ Under the "Marginal" Increase In Women's Participation, $\Pi f \rightarrow f$

(r = 0.1, c = 0.01)

Values in Percentages

	(dA)' = 1			(dA)' = 2			(dA)' = 3		
	$\rho = .11$	$\rho = .12$	$\rho = .15$	$\rho = .11$	$\rho = .12$	$\rho = .15$	$\rho = .11$	$\rho = .12$	$\rho = .15$
k = 1/2	4.3	2.7	1.7	8.6	5.4	3.4	12.9	8.1	5.1
k = 1.0	6.0	3.5	2.0	12.0	7.0	4.0	18.0	10.5	6.0
k = 2.0	7.7	4.3	2.3	15.4	8.6	4.6	23.1	12.9	6.9
k = 3.0	8.5	4.7	2.5	17.0	9.4	5.0	25.5	14.1	7.5

TABLE 5

Values of Δ Under A "Full" Increase In Women's Participation, $\Pi f \rightarrow 1$

(r = 0.1, c = 0.01)

Values in Percentages

	(dA)* = 4			(dA)* = 6			(dA)* = 8		
	ρ = .11	ρ = .12	ρ = .15	ρ = .11	ρ = .12	ρ = .15	ρ = .11	ρ = .12	ρ = .15
k = 1/2	17.2	10.8	6.8	25.8	16.2	10.2	34.4	21.6	13.6
k = 1.0	24.0	14.0	8.0	36.0	21.0	12.0	48.0	28.0	16.0
k = 2.0	30.8	17.2	9.2	46.2	25.8	13.8	61.6	34.4	18.4
k = 3.0	34.0	18.8	10.0	51.0	28.2	15.0	68.0	37.6	20.0

Appendix Table 1

Ratio of Females to Males Enrolled in Higher and Secondary Education

Countries ranked (within each region) according to the former.

		Percentages			
		Higher		Secondary	
AFRICA					
I	Chad	5		11	
	Central African Empire	6		18	
	Burundi	7		30	
	Congo	8		35	
	Ethiopia	8	7.8	28	20.
	Guinea	8		21	
	Mali	9		16	
	Zaire	9		27	
	Somalia	10		22	
II	Niger	11		27	
	Malawi	12		27	
	Cameroon	12		32	
	Togo	14		23	
	Mauritius	15		44	
	Nigeria	15		33	
	Libya	16	15.8	31	30.
	Sudan	17		29	
	Senegal	17		28	
	Ivory Coast	17		21	
	Sierra Leone	18		39	
	Morocco	19		28	
	Uganda	19		24	
	Ghana	20		39	
III	Algeria	21		34	
	Liberia	22		25	
	Upper Volta	22		31	
	Zambia	24	23.5	33	32.
	Tunisia	25		32	
	Madagascar	27		42	
IV	Lesotho	41	41.0	56	49.
	Angola	41		42	
LATIN AMERICA					
I	Panama	20	25.0	52	48.
	El Salvador	30		44	
II	Peru	32		43	
	Ecuador	32		45	
	Nicaragua	34	33.2	47	47.
	Chile	35		54	

		Percentages			
		Higher		Secondary	
LATIN AMERICA cont.					
III	Paraguay	42	45.2	50	51.8
	Uruguay	44		54	
	Costa Rica	44		51	
	Venezuela	45		52	
	Brazil	48		52	
	Argentina	48		52	
ASIA					
I	Yemen	10	12.0	12	19.0
	Bangladesh	10		21	
	Afghanistan	13		13	
	Saudi Arabia	15		30	
II	Turkey	21	25.4	30	32.3
	Syria	21		30	
	Pakistan	24		24	
	Korea	27		41	
	Indonesia	28		37	
	Iran	28		35	
	Iraq	29		29	
III	Singapore	32	33.0	93	68.5
	Malaysia	34		44	

Source: UNESCO - Statistical Yearbook, 1976.

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Sex Differences in the Effects of Nutrition and Social Environment on Mental Development in Rural Guatemala

Patricia L. Engle
Battelle Memorial Institute

Charles Yarbrough
John Townsend
Robert E. Klein
Marc Irwin
Instituto de Nutrición de Centro America Y Pánama, Guatemala

Eight years ago, the Instituto de Nutrición de Centro America Y Pánama (INCAP) began a longitudinal study on the effects of malnutrition on mental development in four villages-- two experimental and two control-- in rural Guatemala. A high calorie, high protein nutritional supplement was given to children and their families in the experimental villages. Children in all four villages were tested each year in order to determine the effect of supplementation on mental development. When the test scores were analyzed, it was found that there were virtually no differences between girls' and boys' scores, but that girls' scores from the last three years of the study were significantly higher than those in the first three years in both the experimental and control villages. This paper explores two questions raised by such results: Do the effects of the nutritional supplement on growth and on mental development vary by sex? How do sex differences in the social environment affect physical growth and mental developmer

Acknowledgment: Thanks to Judith Balderston and Jane Fraser, University of California at Berkeley, for their analyses of the Census data, and to Dr. S.B. Nerlove for her comments on an earlier draft.

To provide background for our discussion of the INCAP findings, three issues are addressed. First, we summarize the deleterious effects of malnutrition on physical and mental development. Second, differences by sex in mental performance are addressed. Third, the rationale for exacting sex differences in social factors on mental development are outlined.

Then, turning to Guatemala, we describe sex differences in the social environment and nutritional inputs, including sex differences in the impact of supplement on growth. Next, we examine differences by sex in mean levels of mental test performance; finally, we test whether the influences of nutritional and social variables differ by sex.[1]

Effects of Malnutrition on Mental Development

The current literature indicates that both nutritional and social factors have substantial impact on mental development. The deleterious effects of the cycle of poverty, including poor nutrition, poor health, and restricted educational and intellectual stimulation, have been well documented (Klein et al., 1975). These influences appear to function concurrently; an adequate home environment can ameliorate to a large degree early severe nutritional stress (Winick, 1975; Lloyd-Still, 1974). On the other hand, a rehabilitated child who is returned to a deprived environment will return to his former state, whereas the rehabilitated child in a more supportive environment will conserve gains from treatment (Richardson, 1976). Malnutrition is believed

[1] It should be noted that in this paper we are not concerned with establishing the causality of the association between nutrition supplementation and mental development; that issue has been treated extensively elsewhere (e.g., Klein et al., 1977) and will be further explored in forthcoming INCAP studies. We are concerned here only with the differences by sex in the association of nutrient ingestion and mental development.

to diminish mental capacities through several mechanisms: directly, by possibly irreparably damaging the nervous system during brain growth (Winick, 1976), or indirectly, by reducing the energy available to a child for the exploration and interaction with the environment that is crucial for optimal mental development. An undernourished child's lack of receptivity to stimulation, coupled with the poverty of his environment, augers ill for the full development of his or her mental capacities. Despite the wealth of discussion and research on this issue, little effort has been directed toward exploring sex differences in these influences. Sex differences are either ignored, or only a single sex is used, as in Richardson (1976), Winick (1975), and Graves (1976).

Sex Differences in Mental Development[2]

Psychologists have identified three ways in which sex differences in mental development are shaped: 1) genetic or biological differences; 2) reinforcement or shaping of a child's behavior by parents or others into "boy" patterns or "girl" patterns; and 3) a child's apparently spontaneous adoption of sex-appropriate behavior congruent with his or her own gender identity, which appears to be formed very early. Most investigators agree that all three interact with each other to determine sex-appropriate behavior and that each contributes to the final behavior pattern (Maccoby and Jacklin, 1974; Lewis and Weinraub, 1974).

Biological differences in physical growth are clear; boys are larger and heavier from birth onward (Garai and Scheinfield, 1968). It is generally

[2]Most of the studies discussed below have been done in the United States, and their results may not be wholly applicable to other cultures. We report them in order to provide an indication of the current thinking about the causes of differences in mental development.

accepted that they are biologically more at risk than girls, "more susceptible to damage by a variety of noxious environmental agents, both prenatally and postnatally" (Maccoby and Jacklin, 1974: 350-351). The presence of male hormones prenatally appears to affect subsequent activity levels and temperament in girls, although increases in IQ could not be attributed to presence of the hormone (Ehrhardt and Baker, 1974; Baker and Ehrhardt, 1974).

On the other hand, sex differences in cognitive abilities are established on only a few points. At adolescence, girls tend to excel in verbal skills and boys in visual-spatial and mathematical skills. Before that age, tested abilities of both sexes tend to be similar. The differences that are found appear in the preschool years; girls' verbal abilities mature earlier than boys', boys tend to be more impulsive (quicker to respond) and more active in a variety of situations than girls (Maccoby and Jacklin, 1974).

One might infer from the preceding that nutritional deficits would be more damaging for the growth of males and that supplementation of an at-risk population would be more effective for boys' growth than for girls, since boys are both more likely to be biologically at-risk and to require more nutrient intake for their larger size. Whether this difference would extend to mental development depends on complex issues of how nutrients are used--whether for growth or for activity--and on what theory is being applied to explain why better nutrition increases mental development.

The second group of influences on sex differences in mental development is the sex-specific behavior of parents and others toward children. We note that there is evidence that this differential behavior begins as early as birth. Specific differences are summarized in Maccoby and Jacklin, 1974. Although the behavior of parents toward boys and girls tends to be different, it does not appear to reflect much favoritism to one sex or the other; in

fact, most studies of sex preference in the United States have reported a desire for the one-boy, one-girl family, although one study (Coombs, 1972) found a mild son preference.

A third view explaining sex differences is the cognitive: the child develops a definition of herself as belonging to one gender or the other, and then models her behavior according to those patterns. This theory explains why a little girl may define women as people who wear lipstick even if her mother would never touch the stuff, or why a four-year-old would believe that she could only be a nurse, not a doctor, even though her mother was a doctor (Kohlberg and Ullian, 1974). Kohlberg found that children at ages three or younger can label their gender correctly, by age four begin to assign characteristics to that gender (boys can't be mommies), and by ages six and seven have developed unshakable concepts of what boys are and what girls are. These stereotypes may be culturally determined, but they can vary with the child's immediate situation. For instance, a recent study showed that daughters of working mothers had fewer sex-role stereotypes than daughters of nonworking mothers and that girls' stereotypes declined with age (Marantz and Mansfield, 1977). Therefore the role models presented may have a short-term significance.

Sex Differences in Social and Nutritional Correlates of Mental Development

Sex differences in social class correlates of mental development are contradictory. Many early longitudinal studies found that boys' IQs were more influenced by environment (e.g., parental education) and girls' by heredity (Maccoby and Jacklin, 1974), yet Yang and Moss (1978) found male babies to be characterized by variables less likely to be influenced by the environment. We have no specific hypotheses as to which sex will be

more affected by the social class indicators. However, the more extreme the social stereotyping, the more differences we might expect to find.

In the Guatemalan data we might predict, then, that the nutritional supplement would have a greater effect on the boys' mental development than the girls', and that the role of the social environment might be equivalent.

Guatemala: The Study Design

The INCAP study is a longitudinal, quasi-experimental intervention study. In 1969 four villages from an Eastern, Spanish-speaking section of Guatemala, where moderate protein-calorie malnutrition is endemic, were matched on a number of demographic, social, and economic characteristics. The intervention was differential supplemental feeding of two groups; two villages (one large, with 1,200 residents; the other small, with about 800 residents) were selected as "experimental" villages, and a high protein-calorie drink similar to a popular corn-base gruel (atole) was made available twice daily at a central dispensary for all residents; and two (a large and a small) were selected as "control" villages, and a refreshing drink (fresco), containing no proteins and about a third the calories of atole, was made available. After 1971 both beverages contained enough vitamins and minerals to assure that none of these substances would be limiting in recipients' diets. In all villages,

free preventive and outpatient medical care was provided throughout the study. Consumption of supplement as well as attendance at the center and clinic were voluntary.

The design is both longitudinal and prospective. From 1969 until March 1977, data on children's health, home environment, and consumption as well as cognitive development were collected. In 1975 a study of fertility behavior in the four villages gave us data on length of lactation for each child, and on parents' attitudes toward work, status, lactation, and sex preferences. This sample is larger, since it included all mothers in the four villages, regardless of whether they had a child aged seven or younger. A census survey of all village residents was taken at the same time.

Villages. The families who have participated in the longitudinal study reside in four Spanish-speaking Ladino communities. Virtually all families (83 percent) are engaged primarily in subsistence agriculture. The main crops are corn and beans. Cash crops in this arid region are limited to tomatoes, cassava, and tobacco. There is little permanent migration to or from the communities, although some men and families travel to the coastal zone once a year to harvest cash crops, or go to work in other communities as short-term laborers.

The pervasive poverty of the study communities is conveyed by the fact that the median family income in 1975 was approximately $500 per year, less than half in cash. Families generally live in two-room houses constructed of local materials, mainly adobe. One room serves as a

kitchen and the other as sleeping quarters for the whole family. Houses nearly all lack sanitary facilities. Clothing is simple; women wear simple dresses, and the wealthier wear shoes and may have a sweater. Both infectious diseases and moderate protein-calorie malnutrition are endemic. The median number of living children per family is four, with a maximum of 15. Many children die; 46 percent of the mothers reported having at least one child die. Those who die, die young; 85 percent live less than a week, whereas only 2.4 percent die after age three. Infant mortality has changed dramatically with the nutrition and medical care provided by INCAP--from 200/1,000 to 55/1,000. (Ethnographies of the villages can be found in Nerlove et al. [1974] and Majia Pivaral [1972].)

Subjects. Subjects in the study were all children who were under seven years of age in February 1969, when the study began, or who were born into the communities between that date and March 1973. Data collection continued on this sample until September 1977, but no newborns were added. At each year in the program, children three through seven were tested. For instance, a child who was seven in 1969 would only have been tested five times. A child born in 1969 would be eight at the end of the project (February 1977), and theoretically would have been tested all his life. Analyses of an age-group, then, include children tested during each year of the project, but each child is included only once. The age groups are overlapping; a four-year age group will include most of the children who were in the three-year age group. A total of 1,235 children have been tested at least once, and 671 have been followed since birth. Nutritional and mental development measures were obtained for 95 per cent of the children who were present in the villages at the time of each measurement.

The Nutritional Supplement

The project was initially designed to test the effects of protein supplementation on mental development. Fresco, with no protein and only one third the calories of atole, was to be a control beverage. However, it appears that fresco may also have a supplementing effect: First, our findings indicate that it is lack of calories rather than protein in the home diets that limits development; if the diet contains insufficient calories, protein has to be used for energy and activity rather than growth. Second, we have found similar associations between fresco intake and growth and atole and growth.

The children's supplement ingestion and home diet have been assessed; however, the independent variable used was calories of supplement ingestion, a highly reliable value. Home diets have not been used in testing the main hypothesis, because data on diet could only be gathered by asking each mother to recall what her child ate the day before. The answers tended to be unreliable and perhaps biased (systematic over- or under-reporting for certain individuals). Therefore, only total supplemented calories ingested are used here.

Can the fresco be considered to be a placebo--to have no effect? The most recent evidence suggests that fresco itself has too few calories to have a nutritional impact. Rather, it plays a different role in the food system from atole. Whereas atole, a thick, warm, brown drink, is seen as food, and ingested in great quantities early in life, fresco is a cool, refreshing liquid that is primarily a thirst-quencher. Older children drink it, beginning at about age three or four. Further, atole tends to replace the home diet (children eat less at home in atole villages),

whereas the fresco-drinkers tend to have more substantial home diets. Thus, an association between growth and fresco may be due to home diet (Lechtig, in progress). Here we will use the supplement (atole) measure, acknowledging that significant associations between fresco and mental development may be a function of home diets.

Sex Differences in Nutritional Status and Growth.

Sex differences in the input measures of nutritional supplement, home diet, and months of breastfeeding tend to be small or absent. In a two-way analysis of variance of sex by fresco/atole village type, boys were found to have ingested more supplement from age two to age three, ($t=4.07$, $df=1/727$, p .04), but not in subsequent years. No differences in months of breastfeeding by sex were found (mean = 18 months). Home diet data were available for only one third of the subjects at the time of this writing and did not differ by sex. Days ill with diarrhea, an illness that reduces nutrient availability, was also compared by sex. Boys were more often reported to have diarrhea at ages four and five ($t=1.96$, $df=65$, $p<.05$; $t=1.96$, $df=600$, $p<.05$ at 5).

Growth differed by sex. Boys were taller and heavier and had more weight for height than girls at all five ages compared (three to seven). Differences were greater at earlier ages. These findings replicate earlier conclusions that boys were taller and heavier than girls from birth through age seven (Yarbrough et al., 1975). Yarbrough et al. also found that differences between sexes were greatest at 30 months and decreased after four years of age and that this deficit in growth compared to a sample of well-nourished American children was similar for boys and girls.

Martorell (in progress) finds associations between both atole and fresco ingestion and growth in height and weight, particularly up to three years of age. These effects appear to be very similar for boys and girls. The slopes in the fresco villages tend to be larger than in the atole villages, which may be due to nonlinearity in the effects or to a positive association between fresco ingestion and home diet.

Sex Differences in the Social Environment

We expected that in the traditional rural villages of this study, cultural sex-role stereotypes would be strong and parental behavior might tend to be sex-specific. Observations of parental behavior were not available, so we present here evidence of the specificity of the sex-role definitions from two sources: observations of the degree of sex-typing in children's play and work, and attitudes toward typical male and female roles. The latter includes the variety of roles women may occupy, parental preferences for boys or girls, and the reasons for these preferences. From these attitudes we can make inferences about parental behavior toward children, and about possible favortism in their behavior toward boys or girls.

Sex-typing of certain activities appears to be widespread and, in preindustrial societies, virtually universal (Ford, 1970). Romney (1965) suggests that sex-typing is greatest in nuclear families and when food must be accumulated and stored. In our villages, 73 per cent of the households are nuclear, and the main occupation of 83 per cent of the men is agriculture, which should suggest substantial cultural sex-typing patterns.

Observations in the villages confirm the hypothesis that many activities are defined by gender. Nerlove et al. (1974), in an in-depth observational study of children's behavior in two of the four villages report that:

> Girls are more often found playing in home environments--houses or patios--than are boys. The more mature and active boys who are not yet involved in work with their fathers are quite independent and participate in play that may take place quite far from their homes, like bathing in the river or picking fruits. Both sexes enjoy many of the same activities; other activities are clearly sex-typed (p. 274).

Boys' work and play activities take them farther from home. For instance, Nerlove observed 31 boys and 31 girls aged five to eight on 20 occasions, and girls were rarely outside of the community, whereas many times the boys were (number not given). In the five-to-eight age range, a large variation in work chores by sex was found, although some jobs are not stereotyped; for instance, both boys and girls may be involved in taking care of young children. While there is, then, some flexibility, roles tend to be well defined.

Stereotypes in the Woman's Role. Women in this culture center their activity in the home. The major household structure is nuclear: 73 percent of the 484 women in the fertility study sample reported living alone with husband and children; 23 percent lived with the family of one or the other; and only 3 percent were women living alone with children. The remaining 11 percent reported themselves to be in stable unions (unmarried but living with a man) at the time of the interview.

Their work experience tends to be limited. Thirty-one percent had not done any work outside the home since the age of 15. At the time of the interview, 69 percent were not working at all. Of those currently working, 50 percent were involved in a home craft. All but one of the latter were in one village (the small, fresco village) and were making straw hats at home. In that village, 80 percent of the mothers work, whereas in the other three from 13 percent to 24 percent of the women work.

When asked if they would like additional work, 64 percent of the women replied that they would; popular alternatives were domestic work for money (ironing, mending, washing) and selling wares outside of the villages. The husbands were not, however, enthusiastic about their wives working; to separate questions concerning possible conditions under which women might work outside the home (with young children, with older children, occasionally, full time, or his own wife if she wanted to), 76 percent of the husbands said no to all five conditions. Clearly, there is a discrepancy in work desires and activity, and a social limitation placed on the woman's capacity to develop her working potential.

Schooling tends to be limited for these mothers. Forty-nine percent of the 484 in the life history sample never attended school, and only 2 percent attended for six years; most who attended went for one or two years only. Only one mother reported having any job training besides elementary school. Adult women tended to be less schooled than men. A census survey of all women and men in the four villages showed that slightly more women than men had never attended school (62 percent of 697 women; 59 percent of 564 men), and fewer reached the upper primary level (5.7 percent of the women; 11 percent of the men).

Men are more likely to report that they read and write than women; in the census survey, 22 percent of the women and 39 percent of the men said that they could read. In families with two heads, the father could read better than the mother in 31 percent of the cases, yet the mother could read better than the father in the 15 percent of the families.

Parental Sex Preferences. Despite the traditional Latin notion of machismo, Pebley, Delgado, and Brineman (1978) note little evidence for strong son preferenc in Latin countries. Stycos (1955), and Inkeles and Smith (1974) both found eviden of equal preference for males and females. Williamson (1976) developed criteria for sex preferences based on economic functions, social/cultural role, and psychological rewards or costs of children. Her theory would predict that rural parents would prefer sons more than urban parents do, and that where there is sex-role segregation of household work, equal preferences would be seen. Thus, we might expect a preference for equal numbers of boys and girls or a mild son preference in our data.

Pebley et al. (1978) analyzed the responses of mothers and fathers in the four villages to three questions about preferences for boys and girls; how many children of each sex they felt that a couple like themselves needed, what sex they would like the next child to be, and which of two pictures depicting families varying in number of boys and girls they would like for their own. They compared results in the four rural communities with responses in a more urban community just outside Guatemala City. The most common response for both men and women was for equal numbers of boys and girls, and the preference for the next child was for the sex that would equalize that number. In the forced-choice paradigm,

women in both the rural and urban areas preferred the picture with more sons. The husbands showed more son preference than the wives in the rural areas, as expected. In the urban area, the percentage of both husbands and wives who preferred daughters, although low, was higher than in the rural area.

Both mothers and fathers were also asked about their preferences for boys and girls ("which children are more useful within age groups, and their reasons for these preferences.") What is remarkable about these responses is their consistency. As Table 1 shows, many mothers and fathers regard boys and girls as equally useful when young, but, when there is a difference, mothers perceive girls as more useful and fathers perceive boys as more useful. In the older age group, boys are seen as more useful by both mothers and fathers. The reasons differ by sex; young girls are seen as more help by both mothers and fathers because they are around home more and are willing to do simpler work. Both mothers and fathers see boys as more useful when they are older because they can earn more, which is logical since parents usually expect support in their old age from their children. Whereas boys are seen as earning more, girls and young women are perceived as being at home more than the boys, a perception borne out in behavior observations. (Nerlove et al., 1974).

In sum, there are consistent differences in attitudes toward and expectations of boys and girls and there is sex-typing in a number of activities, but both sexes have unique roles to play and families do not appear to have a clear preference for boys. As might be expected, there was no evidence of mean sex differences in the input variables of home diet, months of breastfeeding, or supplement ingestion beyond age three. Boys had a higher incidence of diarrhea, a finding often replicated in the literature

Reasons for Perceived Differential Usefulness of Children, By Sex[a]

	Mothers				Fathers			
Younger Children	Males		Females		Males		Females	
	N	%	N	%	N	%	N	%
Around home more	0	0	73	38	1	2	22	78
Stronger	7	12.0	0	0	4	6	0	0
Less exposed to risk or danger	17	29.3	0	0	5	8	0	0
More obedient	4	6.9	19	9.9	2	3	4	14
Smarter	4	6.9	8	4.2	4	6	1	4
Does simpler work	18	31.0	91	47.4	0	0	0	0
Has to learn or can be taken to work	4	6.9	1	.5	42	63	0	0
Other	3	5.2	0	0	9	14	1	4
Total	58	100	192	100	67	100	67	100
Older Children								
Around home more	11	3.9	12	29.3	5	4	3	25
More responsible	3.0	10.6	19	46.3	32	22	4	33
Less obligations	0	0	2	4.8	1	1	.5	8
Earn more money	107	37.9	0		5	4	0	0
More job opportunities	120	42.6	2	4.8	52	36	2	16

TABLE 1 (continued)

	Mothers				Fathers			
	Males		Females		Males		Females	
	N	%	N	%	N	%	N	%
Older Children (con't.)								
More street-wise	3	1.0	0	0	0	0	0	0
Stronger	0	0	0	0	30	21	2	16
Other	11	3.9	6	14.6	19	13	0	0
Total	282	100	41	100	144	100	12	100

Note: Fathers' responses adapted from Pebley *et al.*, 1978.
Data from Corona (1978).

[1]Responses indicating no preference not included.

Sex Differences in the Impact of Supplement Ingestion on Mental Development

Measures of Mental Development. Children were tested annually at ages three through seven. Twenty-three tests chosen to assess a variety of intellectual abilities including reasoning, learning and memory, and perceptual analysis comprise the Preschool Mental Development Test Battery. Of these tests, 13 were in the battery in 1969, and the remainder were added in 1971. Ten tests were administered at ages three and four, and twenty-two at ages five, six, and seven, reflecting the wider range of abilities and greater ease of testing for older children. A mental composite score was constructed at each age by summing all of the cognitive tests in standardized form.

The testing houses were designed to be very comfortable for the children. Great care was taken to standardize the testers and to rotate them among villages. Details of the method are to be found in a series of forthcoming papers (Lechtig et al., Martorell, et al., in process).

Measures of the Home Environment. The quality of the child's home environment was measured for each family by five social and economic indicators: the quality of the family's house, a measure of whether the parents wear sweaters and shoes, the extent of familial teaching of preschool children, a composite scale of the mother's vocabulary, literacy, years of school passed, and modernity (Inkeles and Smith, 1974), and a measure of the visual stimulation and presence of reading matter in the home. The parity of the child was also measured. SES data was not available on all subjects.

Differences in Test Scores by Sex. Sex differences in test performance were not expected, because of the initial standardization process. However, simple t-tests between means for boys and girls were computed. From the literature, we expected girls to show initial precocity in verbal abilities an to be less impulsive. In fact, at age three, girls had higher scores on the D Memory test ($t=2.21$, $df=597$, $p<.03$). On the other hand, boys were less impulsive; on two tests that presumably measure a child's ability to inhibit impulsive responding, Embedded Figures and Draw-a-Line-Slowly, boys showed a clear superiority at most ages.[3] Finally, boys had higher verbal reasoning scores at age seven ($t=3.84$, $df=703$, $p<.01$).

It has often been hypothesized that boys' scores are more variable than girls', Two kinds of variability were examined--variability among test scores for a single child, and variability b tween test scores for all boys and for all girls within an age group. No sex differences in within-child variability were found at any age. Differences between boys' and girls' variance were generally insignificant.

Sex differences in years of school attended were not available, but in a neighboring village, no differences were found (Engle et al., 1977).

Effects of Supplement Ingestion on Mental Test Scores. Slopes of supplement ingestion on the composite test scores are presented in Table 2 for atole and fresco boys and girls. Only data

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[3] Embedded Figures Test time: $t=1.93$, $df=698$, $p<.05$ at 3; $t=2.17$, $df=800$, $p<.03$ at 5; $t=4.44$, $df=734$, $p<.00$ at 6; and $t=5.73$, $df=700$, $p<.00$ at 7. Draw-a-line-slowly: $t=2.59$, $df=667$, $p<.01$ at 3; $t=2.12$, $df=806$, $p<.04$ at 4; $t=2.25$, $df=750$, $p<.03$ at 5; $t=2.20$, $df=602$, $p<.03$ at 7.

Table 2. Regression Slopes of Nutritional and Social Variables on Cognitive Composite Scores

Atole Girls									
Age:		3		4		5		6	
Variables		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Supplement	b	.01	-.04	.01	-.04	-.02	-.08	-.02	-.07
	F	(.11)	(1.35)	(.04)	(1.99)	(.28)	(3.51)	(2.43)	(2.70)
House Quality	b		.98		.54		.78		2.06
	F		(4.96*)		(1.76)		(1.02)		(5.79**)
Parental Teaching	b		.87		1.11		.45		1.91
	F		(3.08)		(5.75**)		(.23)		(2.99)
Clothing Quality	b		-.84		.32		.38		-.61
	F		(3.16)		(.54)		(.19)		(.37)
Reading Materials	b		-.04		-.09		.45		.36
	F		(.07)		(.06)		(2.34)		(1.10)
Maternal Intellectual Characteristics	b		.16		.03		.26		.68
	F		(1.14)		(.05)		(.91)		(5.19*)
Village Size	b		1.12		1.39		1.71		2.72
	F		(3.40)		(5.92**)		(2.26)		(4.39*)
Months of Lactation	b		.05		.10		.19		.21
	F		(.56)		(3.13)		(2.75)		(2.72)
Birth Order	b		-.17		-.19		-.42		-.53
	F		(2.88)		(3.97*)		(5.40*)		(6.82**)
Month in Project	b		.05		.05		.08		.08
	F		(13.80**)		(15.82**)		(12.92**)		(8.44**)
N		161	136	187	158	190	156	178	145
Atole Boys									
Supplement	b	.05	.02	.07	.05	.08	.11	.08	.19
	F	(3.14)	(.17)	(10.62**)	(3.24)	(3.60)	(3.88)	(4.21*)	(10.56**)
House Quality	b		.18		.28		.69		.55
	F		(.18)		(.50)		(.59)		(.28)
Parental Teaching	b		.84		.22		1.90		2.03
	F		(2.96)		(.22)		(3.91*)		(3.18)
Clothing Quality	b		.26		.90		2.54		1.37
	F		(.28)		(4.17*)		(7.16**)		(1.62)
Reading Materials	b		-.04		.29		.17		.75
	F		(.05)		(2.54)		(.21)		(2.59)
Maternal Intellectual Characteristics	b		.25		.04		.45		.43
	F		(2.71)		(.06)		(1.98)		(1.48)
Village Size	b		.49		-.19		-.94		-2.47
	F		(.60)		(.10)		(.47)		(2.37)
Months of Lactation	b		-.02		.06		.09		.02
	F		(.27)		(1.53)		(.81)		(.02)
Birth Order	b		-.17		-.04		-.07		-.25
	F		(3.39)		(.18)		(.13)		(1.44)
Month in Project	b		.03		.02		.00		-.06
	F		(3.68)		(3.65)		(.02)		(3.15)
N		174	146	207	168	195	152	171	129

Table 2 (Continued)

Fresco Girls									
Age:		3		4		5		6	
Variables		(1)	(2)	(1)	(2)	(1)	(2)	(1)	
Supplement	b	.25	.30	.09	.14	.17	.27	.10	
	F	(7.36**)	(8.77**)	(2.04)	(3.68)	(2.27)	(5.02*)	(.66)	
House Quality	b		-.31		.31		-.92		
	F		(.65)		(.61)		(1.34)		
Parental Teaching	b		-.41		-1.34		-1.33		
	F		(.73)		(7.34**)		(1.63)		
Clothing Quality	b		.26		.49		.30		
	F		(.33)		(1.14)		(.09)		
Reading Materials	b		.11		.15		.72		
	F		(.42)		(.99)		(6.24**)		
Maternal Intellectual Character-istics	b		.11		.26		.55		
	F		(.73)		(3.72)		(3.24)		
Village Size	b		1.27		1.30		3.26		
	F		(3.92*)		(4.02*)		(5.67**)		
Months of Lactation	b		.02		.02		.22		
	F		(.13)		(.17)		(3.47)		
Birth Order	b		-.02		.02		.09		
	F		(.03)		(.02)		(.12)		
Month in Project	b		.03		.02		.01		
	F		(3.86)		(1.77)		(.12)		
N		170	150	202	168	198	160	198	
Fresco Boys									
Supplement	b	.16	.15	.08	.10	.24	.20	.18	
	F	(3.53)	(3.32)	(2.44)	(3.59)	(5.17*)	(3.20)	(6.19**)	
House Quality	b		-.71		-.94		.24		
	F		(5.06*)		(9.07**)		(.10)		
Parental Teaching	b		.25		.00		1.91		
	F		(.32)		(.02)		(3.99*)		
Clothing Quality	b		.98		1.20		1.31		
	F		(6.19*)		(8.95**)		(2.42)		
Reading Materials	b		.24		.19		.38		
	F		(2.59)		(1.61)		(1.67)		
Maternal Intellectual Character-istics	b		-.03		.35		.25		
	F		(.06)		(9.02**)		(.95)		
Village Size	b		.16		-.98		.00		
	F		(.08)		(3.32)		(.00)		
Months of Lactation	b		.13		.14		.21		
	F		(4.86*)		(5.80**)		(3.39)		
Birth Order	b		.24		.12		.17		
	F		(5.41*)		(1.47)		(.59)		
Month in Project	b		.02		.01		.01		
	F		(1.73)		(.64)		(.06)		
N		196	176	238	205	222	182	217	

DNE: Did not reach tolerance level to enter.

*p < .05 .

**p < .01 .

up to age six are presented, because by age seven very few children had received early supplementation.

The initial slopes for total caloric supplement ingestion on the mental composite are significant or approaching significance for males in both the fresco and atole villages. If the supplement caused increased mental development, a boy who has ingested an extra 200 calories per day since the program began, or about one and one fourth cups of atole a day, should increase his composite score by between one third and one half of a standard deviation. This would be very roughly similar to a change in IQ score on a standardized test, like the Wechsler Intelligence Scale for Children, of one half standard deviation, or eight points (e.g., 100 to 108). For the atole girls, on the other hand, the slopes were close to zero at ages 3 and 4 and negative at ages five and six.

Sex differences in the effects of the supplement on the composite were much less evident in the two fresco villages. Slopes were significant for three-year-old girls and were comparable for three-year-old boys. They were significant for boys at five and six. Yet the fresco supplement is considered to be a placebo; its significance derives from its correlation with home diet.

A demonstration of association does not prove causality. (A discussion of whether increased nutrition causes increased mental development will be treated extensively in a series of articles on the INCAP study that are now in progress.) However, it appears that total supplemental calories ingested do not cause increased test performance as measured here for girls, although it may for boys. The large and significant slopes in the fresco villages, where calorie ingestion was quite low,

raise the issue as to whether all of the increased scores could be due to social stimulation from attending the center or to self-selection (smarter children chose to attend).

Relations with Other Variables. To determine whether there was some other explanation for the absence of an effect of supplement on test performance for girls, a second series of regressions were performed in which all other possibly relevant variables that had been measured were controlled for before supplement ingestion was entered. These other variables were the 5 SES indicators previously described, birth order, number of months breastfed (another nutritional input measure), whether the child lived in the larger or the smaller of the two villages in each pair (fresco or atole), and the number of months after the inception of the project (Jan. 1969) that the child was tested (historical time).

Because some children were missing some of the SES indicators, the sample size for this regression is smaller than for the first regression. These figures are also in Table 2.

Controlling for the additional variables had either no effect or increased the size of the slope of supplement ingestion on mental test performances for both fresco boys and girls, and for atole boys. This is not surprising since supplement ingestion and SES were found to be negatively related for the boys but not for the girls. However, the continued lack of effect of supplement ingestion on test performance for the atole girls and the older fresco girls was surprising. We looked within the regression to see what variables were related to the mental composite.

The relationships of the SES indicators and mental test performance were generally positive and significant or almost significant. The few negative relationships seen were probably a function of some SES variables being too closely related, since zero-order correlations of SES and test performance are all positive. No clear or consistent sex differences or atole/fresco differences as to which SES indicator was most related to the test scores appeared.

Several other sex-specific influences on test performance were seen. Girls living in the larger of the two villages tended to score higher than girls living in the smaller of the two villages for both the fresco and the atole village pairs. For boys, on the other hand, scores were either the same or lower in the smaller villages. Because these village differences appeared even after our social and nutritional variables all were controlled for, it is possible that this difference may be due to a different social environment related to village size, such as a more heterogeneous population or more market activity.

A longer length of lactation was associated with higher test scores for both boys and girls. Earlier-borns tended to score higher than later-borns. As we saw earlier, the correlations with the composite were very low. Yet, the slopes were occasionally significant when the other variables were controlled for.

Effects of Historical Time. The slope of historical time was highly significant for atole girls at all ages, even after all other variables were controlled for. It was also marginally significant and positive for three-year and four-year-old atole boys and three-year-old fresco girls.

The significant effect of historical time for the atole girls is surprising, because the supplement appeared to have no effect, and there was no comparable effect of historical time for boys. What could these changes be attributed to? The most obvious possibility was that simply attending the supplementation center improved their scores; children who attended would become acquainted with the staff members, and would also benefit from the social stimulation in the center and from spending time in the streets of the village. If so, we would expect to see higher scores with increased calendar time only for the supplemented groups. To test this hypothesis, we split the atole children into two groups; the least-supplemented group (less than 50 calories per day), and the three supplemented groups. The correlation between supplementation ingestion and days of attendance is high (r = about .80), but not unitary, since children may ingest differing amounts of supplementation at each visit. The fresco group could not be split isocalorically, so an approximately equal attendance group was defined.

Within these four groups, test scores of children from the initial half of the study (first four years) were compared with test scores of children tested in the last half (four years) of the study. Because of the overlapping cohort design, these are not the same children. Correlations between calendar time in months and composite test scores were also computed. These figures are presented in Table 3. The least-supplemented atole boys' scores were never higher in the second half than the first half of the study; in other words, scores of boys tested in the second half of the study were either the same as or lower than scores of boys tested in the first half of the study. Similarly, correlations of historical time and composite test score were insignificant and often negative. For

Table 3 Means, Standard Deviations, and T-Tests of Early Versus Later-Tested[c] Subjects, By Sex and Supplementation Group

	FRESCO						ATOLE					
	Least Supplemented[a]				More Supplemented			Least Supplemented[b]				
Age	N	$\bar{X}$	SD	t	N	$\bar{X}$	SD	t	N	$\bar{X}$	SD	t	r
Males													
3	55	-.70	2.98	.48	51	-.139	3.26	2.37*	33	-.322	2.87	1.07	-.13
	55	-1.02	3.94		47	1.61	4.03		13	-1.343	3.04		
4	41	-.50	3.52	1.22	59	-.25	3.65	1.79	43	-1.101	3.80	-.07	.06
	53	-1.56	4.88		85	.88	3.79		14	-1.025	3.71		
5	36	-.48	6.16	-2.09*	59	-.33	6.58	1.15	43	-.818	5.33	.40	-.07
	28	-5.09	10.35		99	1.06	8.49		21	-1.45	6.91		
6	34	-1.91	5.60	.01	54	-.84	5.47	2.53**	43	-.948	5.35	1.08	-.15
	29	-1.87	13.79		100	2.17	9.28		19	-3.73	10.64		
7	35	-1.38	4.74	-2.28*	49	-.16	7.90	1.64[a]	42	-.83	6.66	-.11	.00
	20	-7.32	11.11		93	2.39	10.40		20	.52	11.40		
Females													
3	56	-1.75	3.44	2.14*	38	-1.12	3.02	3.19**	26	-.046	3.00	-2.04*	.36**
	41	-.17	3.81		35	1.41	3.77		22	1.741	3.05		
4	38	-1.75	3.04	.68	57	-.71	3.14	2.51**	10	-.864	2.64	-1.92	.29**
	40	-1.20	3.97		67	1.06	4.64		15	.768	3.26		
5	31	-2.39	6.42	.47	61	-1.68	6.36	1.65[a]	47	-.63	5.51	-1.86	.18
	31	-1.42	9.55		75	.58	9.48		15	2.70	7.53		
6	38	-1.33	7.39	.26	62	-1.91	6.65	1.46	39	.51	7.14	-.33	.09
	21	-2.11	12.54		77	.16	9.99		19	1.24	9.30		
7	36	-1.08	6.27	1.06	63	-.63	6.77	.29	36	.15	6.30	-.48	.13
	10	-6.64	16.33		89	-.23	9.79		20	1.44	11.00		

ATOLE				
More Supplemented				
N	$\bar{X}$	SD	t	r
52	-.478	3.57	-2.00*	.21**
76	.828	3.73		
48	.397	4.47	-.07[p]	.15*
101	.938	3.58		
43	.414	8.82	-.42	.12
88	1.119	8.96		
41	.150	7.01	-.93	-.04
68	1.62	9.43		
26	.44	6.82	-.32	-.03
74	.99	9.38		
53	.018	3.82	-1.38	.27**
60	.973	3.53		
44	-.503	3.44	-2.52*	.19*
88	1.297	4.07		
43	-1.00	6.28	-2.62**	.18*
85	2.58	7.76		
38	-.08	5.92	-1.44	.19*
82	1.83	8.35		
33	-.47	8.24	-1.63	.21*
70	2.59	9.19		

[a] Similar attendance levels as Atole groups.

[b] Supplement less than 50 kcal/day.

[c] Early=1969 to 1972; later=1973 to 1976.

*$p < .05$.

**$p < .01$

the atole least-supplemented girls, on the other hand, the later children were higher scorers at all five ages, and significantly greater at three ($p < .05$), and four and five ($p < .10$). Correlations of historical time and test performance were significant at three and four as well. Evidently girls' scores are improving over time even without supplement. Among the supplemented atole children, again girls' scores changed more than boys' over time. Whereas for the boys, the first half/second half comparison was significant only at three ($t=2.00$, $p < .05$), and correlations were significant at three and four, for girls they were significant at four, five ($p < .05$), and seven ($p < .10$), and correlations were significant at or beyond the .05 level at all five ages.

In the fresco least-supplemented group, three-year-old girls' scores improved, whereas boys' scores dropped significantly in two age groups (five and seven). In the better-supplemented, better-attending group, results were similar by sex; significant increases were seen for three-, six-, and seven-year-old males ($p < .05$), and for three-, four-, and five-year-old females.

These results do not support the hypothesis that the changes in girls' scores over time were due to attendance at the supplement center. To determine what the processes might be, we returned to the level of individual tests to determine what kinds of mental abilities (verbal and nonverbal) were changing. The individual test scores were correlated with historical time in three groups (atole less-supplemented, atole supplemented, and all fresco). Correlations with historical time for boys were most often significant for response time on the Embedded Figures Test and Discrimination Learning, two nonverbal measures. For girls, the tests with the highest frequency of significant correlations were verbal: Naming.

Verbal Inferences, and Memory for Sentences. These differences are compatible with the hypothesis that the improvements affecting girls are a result of a social change unique to them and not shared by the boys.

Are girls' scores improving with respect to boys' over the time of the study? This is, in fact, happening. In the first four years, sex differences favored boys on several measures; these means, SDs, and t-tests are presented in Table 4. Boys scored significantly higher than girls on Digit Memory at four and five, Verbal Inferences at five and seven, and showed more motor inhibition (they were slower in response time on the Embedded Figures Test, and drew more slowly on the Draw-a-Line-Slowly Test).

In the second half of the study, the girls were higher on several measures: higher on Digit Memory at three, Memory for Sentences at three and four, and Naming at four. Boys continued to show longer response latencies at six and seven on the Embedded Figures Test, and higher Verbal Inference scores at seven. It appears that girls' scores have increased relative to boys' over the period of the study, particularly at the younger ages. Again, their improvement is most noticeable in the verbal measures.

Summary and Discussion

The effects of social stimulation and nutrient ingestion on the mental abilities of rural Guatemalan boys and girls, aged three to seven, were compared. The social class indicators played a similar role for both, but supplemental calories ingested appeared to be more highly associated with test performance for boys. However, the effect of the supplementation on physical growth was very similar by sex.

Table 4 Means and T-Tests[a] of Sex Differences in Test Scores in First Half and Last Half[b] of Project

Test:	AGE	First Half					Second Half				
		3	4	5	6	7	3	4	5	6	7
Embedded Figures Test: Correct Responses	Male	9.74	2.84	4.08	5.77	7.25	10.03	2.86	4.45	6.46	7.51
	Female	9.27	2.84	4.08	5.79	7.27	10.50	2.88	4.85	6.06	7.38
	t	1.23	-.02	.96	-.09	-.09	-1.46	-.19	-1.88	1.36	.62
Embedded Figures Test: Response Time	Male	3.25	3.11	3.47	3.86	4.19	3.12	3.52	3.58	4.06	4.01
	Female	3.12	3.08	3.28	3.52	3.59	2.91	3.35	3.38	3.57	3.57
	t	1.05	.46	1.38	2.31*	4.43**	1.77	1.28	1.62	3.88**	3.73**
Digit Memory	Male	10.07	22.78	37.53	41.32	48.38	10.35	21.84	34.87	42.14	45.98
	Female	10.72	19.32	34.00	42.08	47.82	12.62	22.42	34.85	41.84	46.08
	t	-.64	2.61**	2.32*	-.50	.32	-2.57**	-.55	.02	.23	-.07
Memory for Sentences	Male	11.74	32.78	52.66	64.33	80.86	13.50	33.43	52.23	68.36	79.89
	Female	13.11	30.35	48.39	63.40	76.95	16.48	37.71	55.30	68.37	77.77
	t	-.92	1.11	1.79	.42	1.54	-2.11*	-2.27*	-1.60	-.01	.89
Discrimination Learning: Trials to Criterion	Male	12.68	10.55	11.53	10.73	9.51	12.93	9.29	10.89	9.60	8.35
	Female	13.91	10.48	12.20	10.83	10.00	12.37	9.54	10.98	9.55	9.28
	t	-1.85	.14	-.98	-.16	-.79	.85	-.56	-.14	.10	-1.72
NAMING	Male	6.65	12.24	17.50	20.76	23.49	7.46	13.23	17.88	21.71	24.26
	Female	6.63	12.08	17.41	20.55	23.20	8.22	14.35	18.31	22.12	24.25
	t	.05	.29	.17	.43	.61	-1.80	-2.50*	-.88	-.95	.03
Verbal Inferences	Male	1.23	2.74	4.24	5.52	7.20	2.36	3.26	4.36	5.82	7.20
	Female	1.03	2.73	3.80	5.31	6.63	2.31	3.30	4.38	5.53	6.62
	t	1.20	.07	2.09*	.97	2.54**	.21	-.31	-.12	1.57	2.87**
Draw-a-Line Slowly (Velocity)	Male	.954	.580	.35	.22	.15	.93	.62	.37	.23	.16
	Female	1.106	.709	.44	.25	.17	.95	.63	.39	.23	.18
	t	-2.88**	-3.01**	-2.54**	-1.25	-1.44	-.57	-.33	-.62	.04	-1.71

[a] Pooled or separate variance estimates where appropriate.

[b] First half=1969 through 1972; Last half=1973 through 1976.

*p < .05.

**p < .01

The physical environments of boys and girls did not differ radically; boys ingested more supplement by age three, but from age four on the total amount ingested did not differ by sex. Length of lactation and home diet did not differ by sex, even though boys were larger and heavier at all ages and had more diarrhea at ages four and five.

The social environment presented stereotyped roles for what a woman should do and what a man shoud do, although parents predominantly avowed equal preferences for boys and girls.

Relatively few sex differences in mental development were found, which was expected, since the tests were designed to be equivalent for boys and girls. Differences that were found showed girls to be higher on verbal scores, as was predicted, and boys higher on motor inhibition, which was not expected.

Slopes of supplement ingestion on composite score tended to be significant for boys in both fresco and atole villates (calorie and protein-calorie), but were close to zero for atole girls. Fresco girls' scores were similar to boys', but not significant beyond age three.

A similar pattern in fresco villages was reported for physical growth (Martorell, in progress); it appears either that fresco itself has no nutritional effect but is positively associated with home diet, or that the effect of fresco is nonlinear (greatest at the low end). The atole girls' results are open to several interpretations. Their diets might not be limiting for their mental development, so that the supplement did not make a difference, although it was limiting for boys and for the physical growth of both. Since girls ate as much supplement as boys, that might suggest that they replaced their home diet more.

Second, it is possible that none of the significant slopes can be attributed to nutrition; rather, all are due to self-selection (smarter children attend the center), or to attendance, (children become smarter because they attend the center). Third, it is possible that the nutrient did have an effect, but that we are not measuring it appropriately. Perhaps only supplement ingested during a critical period had an effect on mental performance.

Some birth-order effects were seen, favoring early-borns, and longer breast-feeding was associated with higher test scores. Girls' scores were higher in the larger of the two villages in both the fresco pair and the atole pair, whereas boys' scores in the larger villages were equal to or lower than those in the smaller villages. Also, girls' scores were higher at the end of the project than the beginning, particularly in the atole villages. A similar but much weaker trend was seen for boys in the atole villages. These findings are provocative but are only suggestive.

It is possible that girls' scores are improving because of repeated testing, or that the changes are due to the presence of the program in the villages, or other changes that have occurred within the villages. We can discount the possibility that these improvements are due to increased familiarity with the test materials, since significant improvements appear in the younger age groups, in which the test materials are either completely novel (age three) or still relatively novel (age four). If the testers had changed their methods of administration, which we believe has not happened to any degree, differences should be seen for both boys and girls. the hypotheses that with time little girls were less shy and could perform closer to their potential, or that the testers began to favor the little girls more than the little boys, or that the changes in the ambience of the villages stimulated girls to perform better are not contradictory;

each implies that the social context of the village is increasingly supportive of female competence. Radically new social stimuli were present in the villages because of the project, even though every attempt was made to keep the INCAP profile low.

It is possible that the social impact of the INCAP project was felt much more strongly by girls than by boys. Every day one or two cars appeared carrying the project personnel. The vast majority of the personnel were women (one man every day, and several others that appeared periodically, compared to about six women who were present every day). These women may have served as important role models for the girls; they were obviously working, well educated, well dressed, and in positions of power (a nurse, supervisors who visited the village regularly, etc.). They had a lot of contact with the villagers; each house was visited at least once every two weeks, and other contacts were made in the clinic, at the supplement center, and on holidays. Children were tested and measured regularly by personnel.

Nerlove et al. (1974) observed social role-playing of various kinds, including "pretending to be INCAP project personnel with people in the community as their "subjects" (pg. 275), pretending to be a citadora from INCAP (one who makes appointments for tests of various kinds with members of sample families who are part of the longitudinal study), making soft drinks in imitation of INCAP supplementation (p. 283)." In fact, the citadora was a girl of about 15, hired from the village; here was a specific opportunity for a girl from this village who could read and write to earn money. Other girls prepared the supplement, and some served the city folk tea and lunch. In this culture in which parents value girls because they stay at home and do simple work, and see them as weaker, the presence of these people may have opened a new world of possibilities.

Another new influence was the regular visiting and interviewing of the mother; every two weeks she was visited and her opinions about her own and her children's illnesses were requested. She probably attended the supplementation center, where she visited with the personnel and other mothers. She may have changed from the stimulation, or she may have begun to think of herself as more important, or of her children as more important and deserving more attention because of the energy directed to testing and measuring them.

Although we have presented no data here that conflicts with the hypothesis that supplement ingestion improved boys' scores but not girls', further analysis and complete home diet data are needed to determine whether other nutritional variables would have shown an effect. This might be the case if nutrition is less limiting for girls than boys. A second possibility is that the effects seen for boys are not nutritional but are due to some third factor, such as self-selection. That the effects of the supplement on growth were similar for boys and girls suggests that a differential effect, as observed here, might have a social explanation.

What are the long-term implications of these results? Girls who are well nourished in the first few years of their lives will most likely grow to be taller women, who as mothers will have larger babies (Klein et al., 1975); and birth weight in this culture is associated with a variety of outcomes in growth and mental development (Lasky et al., 1975).

Mental development is perhaps more important for girls' schooling than for boys'; in a study of schooling in the four villages, Irwin et al. (1978) found that girls' years of school attendance was related to their mental test scores at age seven--even controlling for the influences of the family SES--whereas for boys, success in school was much more related to SES. It seems that boys are sent to school as a function of the family standing; the girl may be sent, or may choose to stay, only if she is smart enough. Whether the project will alter schooling decisions for girls in the next few years will be a matter of great interest.

The study illustrates the multiple factors determining mental development. For girls, the impact of added nutrition may be less important than powerful social changes in their lives and an awareness of new social options.

APPENDIX

Table 1. Correlations and Beta Weights of SES and Stimulation Measures With Cognitive Composite, By Age and Sex

		Males					Females				
Correlations											
	Age	3	4	5	6	7	3	4	5	6	7
House Quality	r	.05	.07	.18**	.13**	.15**	.07	.15**	.16**	.19**	.31**
	N	379	442	413	385	356	326	383	382	371	354
Parental Teaching	r	.11*	.17**	.30**	.26**	.19**	.00	.03	.07	.19**	.18**
	N	379	442	413	385	356	326	383	382	371	354
Cloth Quality	r	.18**	.24**	.27**	.23**	.17**	.02	.15**	.14**	.23**	.25**
	N	379	442	413	385	356	326	383	382	371	354
Mother Intellectual Character-istics	r	.16**	.21**	.30**	.27**	.24**	.09	.15**	.11*	.26**	.20**
	N	327	380	340	310	272	294	338	327	313	275
Reading Material	r	.16**	.17**	.22**	.27**	.28**	.06	.10*	.20**	.25**	.24**
	N	326	378	339	308	271	291	332	322	308	271
Birth Order	r	.04	.04	.06	.00		-.02	-.03	-.00	.04	
	N	322	373	334	302		286	326	316	303	
Multiple Regression Beta Weights											
House Quality	β	-.102	-.103	.037	.01		.047	.094	-.010	DNE[a]	
	F	2.68	3.23	.40	.02		.47	2.05	.03		
Parental Teaching	β	.082	.055	.195**	.196**		-.022	-.097	-.078	.030	
	F	1.87	1.03	11.67	10.89		.11	2.51	1.51	.22	
Cloth Quality	β	.172**	.211**	.188**	.193**		DNE[a]	.080	.061	.113	
	F	7.71	14.01	10.45	10.58			1.78	.99	3.52	
Mother Intellectual Character-istics	β	.037	.092	.086	.058		.053	.098	.117	.143*	
	F	.31	2.22	1.83	.77		.63	2.32	3.03	4.86	
Reading Material	β	.132*	.135*	.072	.156*		.033	.057	.194**	.170**	
	F	4.41	5.51	1.51	6.59		.63	.83	8.94	7.79	
	N	322	373	334	302		286	326	316	303	
Total	R^2	.271	.319	.410	.420		.094	.216	.249	.331	

[a]Did not reach entry level.

*$p < .05$.

**$p < .01$.

Table 2. Correlates of Supplement Ingestion and Length of Lactation, By Sex: Sample With Stimulation Measures Only[a/]

Age	N	House Quality	Parental Teaching	Cloth Quality	Reading Material	Maternal Intell. Characteristics	Birth Order	Calendar Time
Supplement Ingestion								
Males								
3	308	-.16**	.07	-.02	.01	-.13*	.04	.17**
4	366	-.12*	.05	-.01	-.02	-.15**	.05	.24**
5	332	-.16**	.04	-.02	-.10	-.14*	.00	.27**
6	301	-.14*	.06	-.03	-.05	-.10	.04	.33**
Females								
3	276	.01	.07	-.03	-.02	-.08	.09	.20**
4	320	.01	.05	-.05	-.01	-.08	.10	.21**
5	315	.00	.03	-.04	-.04	-.09	.06	.25**
6	299	.02	.05	-.05	-.05	-.07	.11	.34**
Length of Lactation								
Males								
3	308	.02	-.01	-.14*	.04	-.10	.21**	.19**
4	366	-.02	-.03	-.14*	.03	-.12*	.15**	.19**
5	332	-.03	-.07	-.13*	.03	-.10	.07	.16**
6	301	-.01	-.06	-.13*	.02	-.10	.07	.15**
Females								
3	276	-.08	-.01	-.18**	.02	-.14*	.14*	.15**
4	320	-.07	.01	-.18**	.04	-.12*	.17**	.18**
5	315	-.05	.01	-.17**	.03	-.08	.20**	.21**
6	299	-.08	.02	-.16**	.00	-.09	.20**	.19**

[a] Sample sizes in Table 5.

* $p < .05$.

** $p < .01$.

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Home Investment in Children in the Rural Philippines

Emeline Realubit Navera
Yale University

This paper is an attempt to put together the earnings function, the investment-in-children demand function, and the fertility function of the household, in order to gain insight into the answers to the following questions (as they apply to less developed countries such as the Philippines):

1) What determines the type and level of investment parents make in their children?

2) What degree of influence does each of the investment determinants (characteristics of the parents and the household) have on the type and level of investment per child?

3) Why is it that even if the direct monetary cost of schooling (at least through the elementary level) is almost negligible, many parents still fail to send their children to school?

4) Is there a difference in the type and level of investment made per child by age and sex?

5) Why is it that, limited in resources as they are, parents in less developed countries continue to have relatively more children than the average among households in the high-income countries?

6) Why is it that children start to participate either in the labor market and/or in home production at an early age, even if their productivity is very low?

This paper tries to identify the important investment components and their corresponding average levels per child by age and by sex, in the hope that they, more than their aggregate magnitudes, can reveal some insights into

the motivations of households' decisions about fertility, labor force participation, and investment in human capital per child. It is hypothesized that these three important household decisions are interrelated and that the circumstances surrounding the household and the characteristics of the parents determine tne relationship among them.

Data and Analysis

This paper reports some very preliminary results of an analysis of data taken from the multipurpose survey of some 246 rural households in Laguna, Philippines, sponsored by the Agricultural Development Council in May 1977. A combination of recall and observation methods of data collection were used in the survey. The recall method was used to gather data on demographic characteristics, schooling, income, wealth, family planning practices, etc.; while the observation method was used to collect data on individual food intake and time allocation.

The analysis uses a reduced form of the "household production" model. (For a description and discussion of the full model, see Appendix 1.) It concentrates on the three most important components of parents' investment per child which are: 1) food, 2) schooling, and 3) childcare time. These three, together with the number of children living, are treated as endogenous variables which are assumed to be jointly determined by the same exogenous variables; thus, ordinary least squares method can be used. The following are the included exogenous variables: 1) Level of education of the father and 2) Level of education of the mother are measured in number of years of schooling and are assumed to affect the level of investment per child and numbers of children directly through tastes and indirectly through income. 3) Age of the father and 4) age of the mother are used as proxy variables for

the number of years of work experience in the earnings function. At the same time, they also serve as controlling variables for the age-specific fertility rate of the mother and duration of marriage.

5) Value of fixed assets net of debts includes household durables, farm capital, and land owned expressed in present values. It should be a good measure of wealth of the household, but values were assigned arbitrarily so it is difficult to know how accurate they are.

6) Land area operated, in most cases, is not a part of fixed assets. It is the area of farm land operated by the household, usually as a share or lease tenant. It is expected to have a strong positive effect on the labor participation of children, particularly in food production, and therefore to have an effect on number of children.

7) Distance from nearest family planning clinic is an identifying variable in the demand-for-number-of-children equation of the structural model. It is assumed to affect number of children directly but not the full shadow price per child (see Appendix 1). In the reduced form used here, however, it is assumed to affect both the level of investment per child as well as child numbers.

8) Age of the child is used as a control variable, since the types and levels of investment requirements would vary with the age of the child.[1]

9) Sex of the child is included in an effort to determine if there is differential investment behavior by sex.

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[1] It would have been desirable to analyze separately household investment demand behavior by age group and sex. However, because of the small sample size, to do so would mean reducing the precision of the estimates greatly.

The Components of Home Investment

1. Market Goods

Food. Food expenditure is the biggest item of investment in a child.[2] It accounts for about two thirds of total expenditures per child at all ages, as can be seen in tables 1 and 2. Food expenditure varies over the life cycle of the child, increasing monotonically with age. It also varies with sex. At ages between 1 to 6 years, the annual average food cost is about 400 pesos for a boy and only P287 for a girl. However, for ages 7 to 12 years the difference is negligible, i.e., P568 for a boy and P565 for a girl. At above 18 years, the difference is again substantial, although not as glaring as at ages 1 to 6 years. It is P979 for a boy and P905 for a girl, a considerable difference of P74 per child per year. It is hard to tell whether this is a case of discrimination in favor of male children at the expense of female children. Since food is placed on the table for every household member to share (and it is not rationed), it could be just that girls by nature do not eat as much as boys.

One staggering implication, though, of the size of the food bill relative to all other items of expenditure, such as schooling and clothing, is that the households under study are living practically at a subsistence level. It seems to indicate that the primary concern of the household is to provide food for subsistence. It may be that children join the labor force (particularly in food production activities) at an early age and leave school as soon as they are old enough to work productively on the family farm or for a wage because they are needed to help provide food, not because their parents do not value schooling.

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[2] Food expenditure reported does not include the value of food preparation time.

Table 1. Expenditures on Market Goods per Child by Age Group and by Sex, in Rural Households in Laguna, Philippines, 1977[a]

(Average per child in pesos per year)

Age Group	Schooling		Food		Clothing		Morbidity		Nonfood	Ceremonial	Total	
	Male	Female	Male	Female	Male	Female	Male	Female			Male	Female
0-1	0	0	b	b	b	b	b	b	57[c]	96[c]	b	b
1-6	7.24	0	400	287	18	14	15	19	57	96	593	473
7-12	6.10	13.79	568	565	22	24	25	40	57	96	774	796
13-17	281.09	151.88	995	836	35	34	55	53	57	96	1,519	1,228
18 up	137.44	192.56	979	905	64	57	99	348	57	96	1,432	1,711

[a]Based on 246 rural households.

[b]Very few cases.

[c]Assumed equal for every household member.

Table 2. Costs of Market Goods as Percentage of Total Cost Per Child, by Age Group and by Sex, in Rural Households in Laguna, Philippines, 1977[a]

Age Group	Schooling		Food		Clothing		Morbidity		Nonfood		Ceremonial		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0-1	0	0	b	b	b	b	b	b	b	b	b	b	b	b
1-6	1.20	0	67.45	60.67	3.03	3.17	2.53	4.02	9.6	12.05	16.19	20.29	100	100
7-12	0.81	1.71	73.38	70.91	2.84	3.02	3.23	5.02	7.16	7.16	12.40	12.06	100	100
13-17	18.5	12.37	65.50	68.08	2.30	2.76	3.62	4.31	3.75	4.64	6.32	7.82	100	100
18 up	9.6	11.25	68.36	52.89	4.47	3.33	6.91	20.33	3.48	3.33	6.70	5.61	100	100

[a]Based on 246 rural households.

[b]Very few cases.

Schooling. Schooling cost accounts for only about 1-2 per cent of total expenditures per child between the ages of 7 and 12, when the child is in elementary school. The minimal cost of about P10 per child per year would cover the cost of paper and pencils and some small school contributions such as athletic fees, Red Cross, etc., since elementary education is provided free in public schools to all children. However, free public high schools are not yet available in every barrio. The yearly average schooling expenditures for children over 13 is about P200 and accounts for about 10 to 20 per cent of the total expenditures per child. As can be seen in tables 1 and 2 there is no systematic indication of sex discrimination in schooling expenditures.

Clothing. This is not an important item in the family budget. It accounts for only 2-4 per cent of total expenditures per child.

Morbidity. This includes expenditures on medicines, doctors, hospitalization, etc., when a child is sick. For a male child it accounts for only 2-7 per cent of total expenditures, but for a female child it acounts for 4 per cent (at ages 1-6 years) to 20 per cent (at ages over 18 years).

Ceremonial costs. This appears to be an important item of household expenditure. It averages about P768 per year per household, which, considering these families subsistence level of living, is rather large. However, to them it may be very important. A child's baptism, for example, and the lavish party that follows is an important family event.

Other nonfood expenditures. This amounts to about P455 per household per year and is assumed to be equally shared by every member of the household.

2. Time

Childcare time of parents. It is generally assumed that care of a young child is a most time-intensive activity for parents, especially for the mother.

Existing fertility models use the differences in the value of time of mothers to explain differential fertility behavior among couples. The premise is that as the price of time of the mother rises, she tends to substitute market goods for childcare time, and that this substitution effect overcomes the income effect of the rise in the value of time, resulting in a tendency to decrease child numbers and increase market-goods investment per child. From table 3, it may be seen that on the average, a mother spends 2.6 hours per day taking care of a male infant and 2.5 hours taking care of a female infant. For children aged 1-6 years, the mother's average care time is reduced to 1.5 hours for a boy and 1.2 hours for a girl; and by the time the child is 7 years old and older, childcare time is down to 1 hour, more or less, for a boy and 0.63 hours for a girl. On the other hand, the father's childcare time is only about half an hour a day, which is more or less equally distributed among all the children 0-12 years old. The mother appears to spend more time caring for her male children than for her female children. However, it may be that young girls are easier to manage than young boys and that therefore the discrimination is unintended.

Food preparation and other home time. These are estimated for the entire household. It is assumed that to this time benefits all household members equally, regardless of age and sex. Food preparation time of the mother is about 1.6 hours per day, compared to only 0.25 hours for the father. Other home time (which includes washing clothes, cleaning the house, etc.) takes up about 2.4 hours for the mother and 0.7 hours for the father.

Total time inputs per child. In terms of total time inputs of the parents, a male infant takes up 3.72 hours per day and a female infant takes up 3.5 hours. For children 1-6 years old it is 2.71 hours for a boy and 2.14 hours for a girl; and for those aged 7-12, it is 2.35 hours for a boy

Table 3. Time Inputs of Parents in Rural Households in Laguna, Philippines, 1976-77[a]

(Average per child in minutes per day)

Age Group	Childcare Time				Food Preparation Time[b]		Other Home Time[c]	
	of Mother		of Father		of Mother	of Father	of Mother	of Father
	Male	Female	Male	Female	98.88	15.07	142.86	40.52
0-1	159	149	22	22				
1-6	96	70	24	16				
7-12	65	38	31	28				
13-17	b	b	b	b				
18 up	b	b	b	b				

[a]Based on observation data from 137 rural households.

[b]Assumed to be equally shared by every member of the household.

[c]Also assumed to be equally shared by every member of the household. Includes dishwashing, housecleaning, laundry, and other household chores.

and 1.81 hours for a girl.

It is important to note that these are only the time inputs of parents. Older children also contribute time for chilcare, as well as for food preparation and for other home production activities. In a previous study (Navera, 1977) using the same Laguna households, I estimated the total time cost of an infant to the household (parents and other children) to be about 5 hours per day. However, as early as the 6 years old the child starts contributing some small amounts of economic time (home production), and by the time he is about 11 years old his time contribution just about equals his time requirements from his parents and older siblings. Thus, children older than 11 already contribute positive economic time to the household. It is possible, therefore, that children may have decreasing time cost to their parents in their order of birth; that is, a later-born child may be less expensive in terms of the parents' time because older children can substitute for the parents in caring for the younger child. This implies that there are economies of scale in the production of children, not in terms of market goods but--perhaps--in terms of the mother's time.

The Demand for Investment Goods Per Child

Food

As can be seen in table 4, the important determinants of investment in food per child are: the education of the father, the age of the mother, and the land area operated by the household. The other exogenous variables included in the demand equation, although not significant, have the correct expected signs. I will discuss each variable separately, with emphasis on the significant variables.

Education of the father has a strong positive effect on a child's food consumption. This may be due to the higher productivity of the more educated father in home and/or market production. Table 5 gives a rough indication of the effect of age and education on market wage. It shows that the education of the father has a strong positive effect on his market wage. Education should also raise the productivity of the farmer father through what Welch (1970) called the "allocative effect" and the "worker effect" of education. The "worker effect" permits a worker to accomplish more with the resources at hand, while the "allocative effect" enhances a worker's ability to acquire and decode information about costs and productive characteristics of other inputs.

Age of the mother. As the mother grows older so do her children, implying that she will need to devote less time to care of very young children and will have more time either to help in food production activities or to work for a wage to augment family income (and hence food) and/or that she will have more time to attend to food preparation and see that everyone is properly fed. Age of mother is also a highly significant variable in the earnings function. Its effect is due not only to the fact that as she grows older the mother has more work experience, but also to the fact that she has more time available to devote to productive activities other than childcare.

Land area operated. As expected and as earlier implied, the size of the farm has a significant positive effect on food intake per child. This is rather obvious since the larger the farm the more food can be produced. An interesting question is whether land area operated affects the decision to have children, since larger farms would need more labor.

Other exogenous variables. The sex of the child is definitely negative, that is, food intake is less for a female child, as earlier discussed. Could this be the reason why female children tend to need more medical attention than

Table 4. Regressions on Selected Cost Components Per Child in Rural Households in Laguna, Philippines, 1977[a]

Independent Variables	Schooling	Food
Sex of child	-35.1981 (0.117)	-163.4610 (2.337)
Age of child	54.8695 (22.698)	5.4202 (2.383)
Mother's education	17.549 (0.476)	0.9305 (0.002)
Father's education	9.8246 (0.195)	55.6920 (10.439)
Mother's age	13.5116 (1.225)	19.2149 (6.215)
Father's age	-8.6301 (0.583)	-3.7665 (0.210)
Land area operated	5.6978 (1.989)	15.6330 (5.933)
Value of fixed assets net of debts	-0.00025 (0.531)	0.000046 (0.285)
Distance from family planning clinic	-1.0694 (0.377)	-1.72451 (2.337)
Constant	-779.3403	11.999
R^2	0.096	0.193
F	4.135	4.519
N	359	180

Figures in parentheses are F-statistics.

[a]Based on 246 rural households.

Table 5. Regressions on Market Wages in Laguna, Philippines, 1977

Independent Variables	Market Wage of Children	Mother	Father
Education	0.5007 (5.512)	3.1089 (29.327)	0.6205 (13.59)
Age	0.4002 (13.383)	1.0027 (55.691)	0.0884 (5.26)
Sex	-0.1882	--	--
Constant	-1.9526	-45.0424	9.9069
F	8.7	33.153	7.940
R^2	0.164	0.298	0.0165

Figures in parentheses are F-statistics.

do male children? The age of the child is of course positive and so is the education of the mother, which would affect not only income but knowledge of nutrition. The age of the father is negative, which at first glance is rather surprising. However, it is possible that older fathers have less education than younger fathers and therefore are less productive and less able to feed their children well. Net fixed assets, which is a measure of wealth, is positive, of course. The distance from nearest family planning clinic is negative, implying that the farther it is, the less food is available per child. This is quite logical, since number of children is expected to be positively related to distance from family planning clinic and, therefore, negatively related to food intake per child. However, it is not significant so that, at best, it could only give a hint of what family planning efforts may be able to do.

Schooling

After the earlier discussion of schooling as a component of child cost, it is not surprising to find that the only significant variable in the schooling equation is the age of the child (see table 4). It seems that all households have more or less the same schooling investment behavior per child, the levels of investment differing only by age of the child. It is interesting to note here that the average schooling level of the mother is 4.5 years and that of the father is 4.4 years, while that of a child more than 17 years old is 7 years. It means that on the average a child is only able to reach the first year of high school. While this is definitely a big improvement over the parents' education, it is far from that point where the usual worker self-investment model starts. With only a first-year high-school education, a child could hardly hope to capitalize his future earnings capacity and borrow accordingly

in order to invest in further education and training.

Family Size[3]

As expected, the education of the father and that of the mother are found to have a negative effect on family size (see table 6). Both education variables are assumed to operate through income effects and price-of-time effects. Theory says that the effect of income on child numbers is positive, but because of the accompanying rise in the price of time, there tends to be a substitution of market goods for time-intensive goods. Since young children have always been considered time-intensive, especially for the mother, it is therefore not surprising to find that mother's education has greater significant effect on family size than father's education. It may also be noted from table 6 that father's age has a very strong positive effect on number of children, while mother's age, though significant, is not as strong. It seems to imply that, indeed, older fathers tend to be less educated than younger fathers. Thus, since the majority of mothers do not work in the market for a wage, the price of their time may be highly determined by their husband's income.

Land area operated, net assets, and distance from nearest family planning clinic should also prove to be important factors in determining family size. Though not significant, area operated is positive and so is distance from nearest family planning clinic, which tends to suggest that the larger the area of land farmed by the household the more children they want and that the farther away the family planning clinic is the greater number of children they have.

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[3]It is assumed that the mothers included in the sample have more or less completed their family sizes, as indicated by their average age of about 40 years and their average number of children of 6 per household. Moreover, the numbers of children include living children only, which is the relevant statistic for relating fertility to child investment demand and labor participation analysis.

Table 6. Regression on the Number of Children Living Per Household in Laguna, Philippines, 1977[a]

Independent Variables	Coefficient	F-statistic
Value of fixed assets net of debts	-0.12230	0.331
Fathers' education	-0.1609	28.741
Mother's education	-0.72890	5.271
Father's age	0.9424	78.912
Mother's age	0.2348	4.145
Distance from family planning clinic	0.2635	1.147
Land area operated	0.7290	2.449
Constant	1.8148	
R^2	.313	
F	51.887	

[a]Essentially based on 246 rural households.

Both points are fairly obvious. Net assets, on the other hand, has a negative effect on number of children, which might be expected because of its effect on income. It may also be considered to reflect family background and taste for market goods, since it includes housing and household durables, as well as land area owned. It is also possible that big landowners do not usually operate their own farms but rent them out to tenants. However, it is not significant and therefore should not be taken too seriously.

Table 7 gives the regression estimates of the participation of children in market activities and of their total economic time (the sum of home production and market production time) using the same exogenous variables included in the demand-for-children equation. It may be seen that the estimated parameters are consistent with those of the demand for children. The education of the father, though positive with wage or market time of the child, is negative with his total economic time. On the other hand, mother's education is negative on wage time but positive on total economic time, implying that children of more educated mothers tend to work more at home than in the market, while children of more educated fathers tend to work more in the market than at home. While the coefficients are not all significant, they do supplement the fertility and the investment analysis.

The single all-important variable in the labor supply equation, at least for total economic time of the child, is the land area operated, which has a significantly strong positive effect. It implies that as the area of land operated by the household increases, the number of children per household also increases.

Table 7. Regressions of Labor Force Participation of Children in Rural Households in Laguna, Philippines, 1977

Independent Variables	Wage Time	Total Economic Time[a]
Education	11.1199 (10.764)	-0.5689 (0.002)
Age	3.6387 (8.681)	15.13027 (3.197)
Sex	-1.4135 (0.006)	65.6227 (1.582)
Mother's Education	-2.8126 (0.261)	21.8130 (2.440)
Father's Education	14.6397 (12.020)	-16.2362 (1.447)
Mother's age	0.6454 (0.207)	6.5004 (1.017)
Father's age	0.38286 (0.101)	-5.6556 (1.017)
Land area operated	0.2345 (0.146)	5.7041 (4.684)
Value of fixed assets net of debts	-.000039 (2.010)	0.00009 (1.518)
Distance from family planning clinic	-0.45102 (2.378)	0.6616 (1.366)
Constant		-235.4320
F	5.87	2.43
R^2	0.339	.233
N	138 (recall)	91 (observed)

Figures in parenthese are F-statistics.

[a]Includes both home and market production.

Conclusion

The results reported here, though highly exploratory, show that the three important family decisions--investment in human capital per child, labor force participation, and fertility behavior--are closely interrelated, and that the relationship gives important insights into the motivations of household behavior. This suggests that if we expect to successfully influence household behavior toward development objectives, we must understand the motivations of the household and the conditions and circumstances that help shaped such motivations.

In the Philippine case, it appears that for rural households, investment in children consists mainly of expenditure for food. Labor force participation of household members (father, mother, and children alike) is also primarily devoted to food production activities in the home and in the market. Family size has been found to be positively related to the size of the farm operated (not necessarily owned) by the household. All of these imply that rural households live at a subsistence level. There is increasing evidence that in most cases, farmers in traditional agriculture are poor not because they are irrational or incompetent but because they have few opportunities to improve their situation (Schultz, 1964). It is possible that under prevailing conditions, households are already efficiently allocating their resources (goods and time) among the limited opportunities available to them and are maximizing their satisfactions accordingly.

Appendix 1

Analytical Framework

The study uses the "household production" model first formulated by Becker (1962) and more recently developed by DeTray (1973), Michael (1973), Willis (1973), Rosenzweig and Evenson (1977), and many others. In this model, the household is viewed as a producing and consuming unit. It has a utility function which reflects the household's tastes and preference for six types of goods: 1) number of children (Z_N), 2) schooling per child (Z_E), health and nutrition per child (Z_H), 4) leisure per child (Z_L), 5) leisure of parents (Z_P), and 6) a composite of all the other goods (Z_0). The utility function may be written as:

$$U = U(Z_N, Z_E, Z_H, Z_L, Z_P, Z_0) \tag{1}$$

Each of these Z-goods is assumed to be produced according to a linear homogenous production function:

$$Z_J = Z_J(X_J, T_J) \tag{2}$$

where X_J and T_J are the amounts of inputs of market goods and time per child, respectively, that the household members put into the jth commodity.

The household is assumed to maximize its utility function subject to a time constraint:

$$T_i = L_i + H_i \tag{3}$$

and a budget constraint:

$$X_i P_i = W_i H_i + V \tag{4}$$

or a full income constraint:

$$F = \sum_{i=1}^{n} W_i T_i = \sum_{i=1}^{n} W_i (H_i + L_i) + V \tag{5}$$

where: n is the total number of persons per household; i is the ith member of the household; T_i is the total time available to a household member i; L_i his leisure time; H_i is his working time; and W_i is the value of his time or his wage. X_i and P_i are the bundle of market goods and their corresponding prices, respectively, that can be bought by his labor income (W_iH_i) and nonlabor income (V). The full-income constraint is simply the sum of the nonlabor income and labor income from both market and home production activities of all the household members.

Maximization of (1) subject to (5) yields the shadow price of each Z-good which is equal to the sum of the cost of goods and time inputs into each Z-good per child and which in some sense expresses the real cost of each good to the household. It is then possible to derive demand functions for each of the Z-goods in terms of their shadow prices:

$$Z_J = Z_J (\pi_J, E) \tag{6}$$

where π_J is the shadow price of the jth commodity (Z) and E is a set of exogenous environmental factors.

If we assume that there is no joint production of these Z-goods, it is possible to estimate the full shadow price per child as the sum of the values of the total goods and time inputs into each child less the value of total goods and time contributions of the child to the household.

The demand for each Z-good may be expressed as a function of the income of the household, and a set of environmental factors related to it. The behavioral model may be given by the following equations in functional form:

$$Y = Y(\text{MEDUC}, \text{FEDUC}, \text{MYRS}, \text{FYRS}) \tag{7}$$

$$Z_j = Z_j (\pi_j, Y, \text{MEDUC}, \text{FEDUC}, \text{WEALTH}, B) \tag{8}$$

where Y = labor income of the parents

MEDUC = level of education of the mother

FEDUC = level of education of the father

MYRS = number of years of work experience of the mother

FYRS = number of years of work experience of the father

A = an exogenous variable affecting the level of investment or the full shadow price per child (but not income), such as distance from nearest schoolhouse which affects investment in schooling

B = another exogenous variable affecting the particular Z_j-good (e.g., for child number it may be the distance from the nearest family planning clinic).

Equation (7) is the earnings function of the parents; and equation (8) is the investment demand function for each Z-good per child. Figure 1 is a flow diagram of the behavioral model translated into an empirical framework, showing the direction of causation among the different measurable variables.

The model implies that parents, knowing the level of income that they earn during their lifetime, and based on their tastes and preferences, first determine the desired qualities that they would like their children to have; and then decide on the number of children they want and can afford to have given the qualities they desire for each child, in terms of both the market goods and time costs, including the psychological benefits and costs associated with having children. This would be a relatively simple story and straightforward if birth control were perfect and costless both in terms of pecuniary and nonpecuniary costs. But the fact is that it is neither perfect nor costless, so that parents have to make adjustments on the level of investment they can afford to make per child with the actual number of children they have. Thus, the actual number of children and the level of investment per child are simultaneously related.

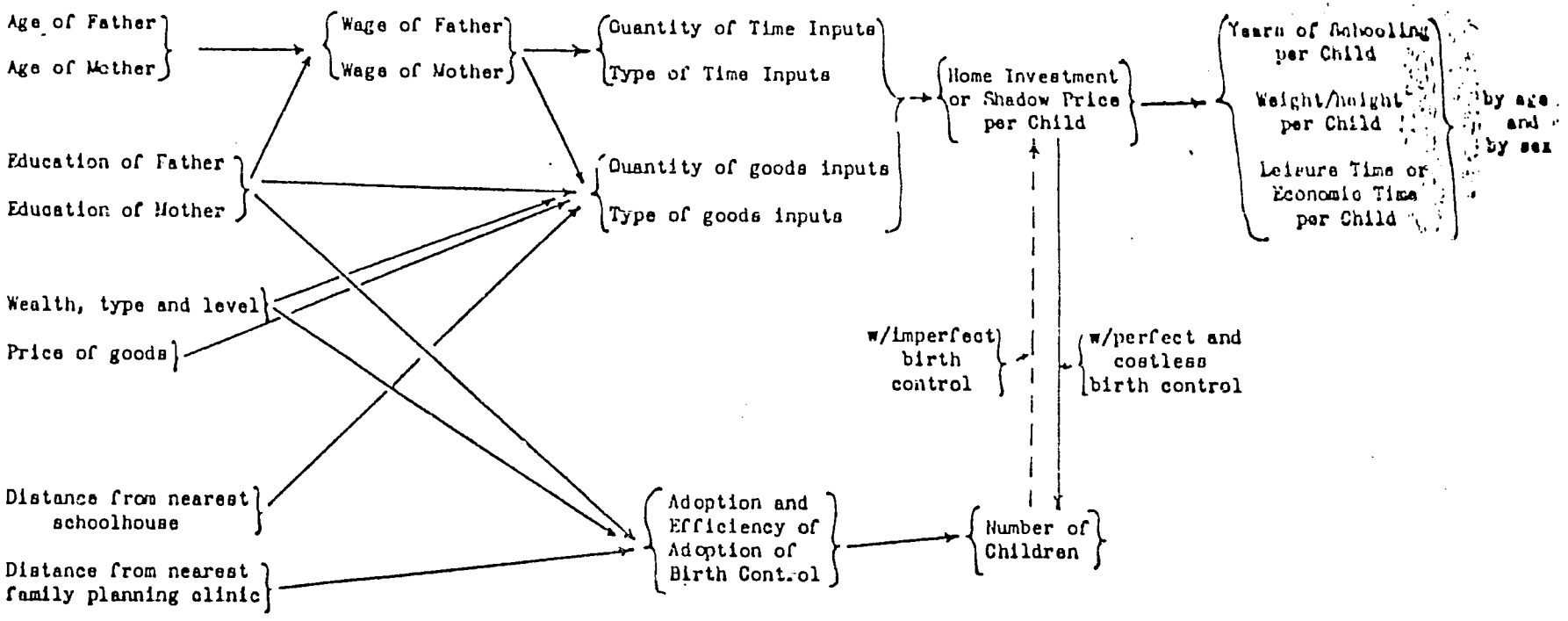

Figure 1

DETERMINANTS OF HOME INVESTMENT IN CHILDREN
(EMPIRICAL FRAMEWORK)

Of course, in principle, there is nothing to prevent anyone from going through the motions of capitalizing inalienable rights and borrowing accordingly (education, for example, constitutes an investment in future earnings capacity), but in the absence of market transactions, measurement of values becomes difficult and lenders are reluctant to commit themselves. In practice, therefore, particularly in less developed countries, the individual is effectively restricted by the means and predisposition of his parents. It is, in this way, that the inequalities of income among the members of one generation are perpetuated and even aggravated among the members of the next (Blaug, 1970).

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Nutritional Stress and Economic Responsibility: A Study of Nigerian Women

Judith A. Harrington
School of Public Health
University of Michigan

While attention has been, and is being, paid to population-related aspects of female status, demographers have not done as much work as is needed on the measurement of women's condition. Many demographic studies contain data that have important implications and consequences for women, but analyses of the data have not uncovered and focused on the information that is there. The search for demographic indicators of female status in existing data sets needs to be done on a large scale and in a systematic way. I believe that such analyses must, at one level at least, center around categories of real life experience, so that our "subjects" can recognize themselves and their real life situations--and we can recognize their needs. Not only have social scientists accepted a data vacuum that is unnecessary, but too often they have followed current policy or funding interests--or simply the trends of "professional" discourse--rather than working on ways of measuring and analyzing the world as it is.

Breastfeeding provides an important example of this neglect of the real world. Currently the relative impacts of breastfeeding on both child spacing and child survival are receiving a great deal of attention. Investigations have demonstrated that declining lengths of lactation have

detrimental effects and have underlined the positive effects of breastfeeding as opposed to bottlefeeding, particularly in tropical developing countries. What has been neglected, however, is a key part of the total picture: very prolonged lactation, such as is common in West Africa, constitutes a heavy physical burden on the women who spend a good part of their lives giving birth to and breastfeeding their children.[1]

This analysis focuses to a large extent on the reproductive role, broadened here to include lactation, and on the economic role, which in the African societies looked at here does not exist separately from the reproductive one.

> It should also be borne in mind that according to the custom prevailing in African societies a woman bears a large measure of responsibility for providing food for herself and her children, and any incapacity on her part creates a serious danger of malnutrition. This is particularly important when a woman is separated from or loses her husband and becomes the sole breadwinner in the family. It is not surprising, therefore, that a high proportion of cases of kwashiorkor (malignant malnutrition) come from homes in which the father is absent.[2]

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[1]See, for example, J. Harrington, "A Comparative Study of Infant and Childhood Mortality in West Africa: Ghana, Niger and Upper Volta," Ph.D. dissertation, Cornell University, 1971; Arrudh K. Jain, Ronald Freedman, T. C. Howard, and M.C. Chong, "Demographic Aspects of Lactation and Amenorrhea," Taiwan Population Studies 1, Population Studies Center, University of Michigan, no date; and John Knodel, "Demographic Aspects of Breastfeeding," Science, forthcoming.

[2]Zbigniew A. Konczacki, "Infant Malnutrition in Sub-Saharian Africa: A Problem in Socio-Economic Development," Canadian Journal of African Studies VI (1972): 439.

Women are expected to maintain themselves and their children during the very periods they are under the heaviest physical stress from the childbearing role--when the child is still an infant and not yet weaned. Women in Nigeria are both producers in and producers of their societies. Elise Boulding points out that Third World women must both produce goods and breed the labor that enables production, especially in the agricultural situation.[3] Their physiological reproductive role encompasses pregnancy, birth, and a prolonged lactation of upwards of two years. High fertility may be for some a national policy issue, and breastfeeding may be ideal from a number of viewpoints, but they are both experienced in large part as physical work. In this paper I will describe an attempt to measure the burdens imposed on Nigerian women by their reproductive and economic roles in order to gain some insight into their world and the ways it can be made better for these women and their children.

I will look first at what is known generally about the physical stress caused by childbirth and breastfeeding and then go on to analyze data from the Nigerian Migration Project, to which are applied indices of relative burdens women in these societies bear. The concluding discussion will present thoughts about ways in which these burdens might be somewhat alleviated.

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[3]Elise Boulding, Women in the 20th Century World (New York: John Wiley, 1977).

Nutritional Requirements of Pregnancy and Lactation

Childbirth "labor" is an appropriate term but it implies that the stress lasts for a short period, whereas in reality the whole period of pregnancy and lactation is a time of increased nutritional and physical stress. Table 1 shows the percentage increase in daily nutritional requirements associated with pregnancy and lactation at various ages.

It should be noted that not only does pregnancy increase nutritional needs, but that for most nutrients the demands of lactation are greater than those of pregnancy. The Report of the 1973 Joint FAO/WHO AdHoc Expert Committee increased the recommended energy allowance per pregnancy from 40,000 Kcal to 80,000 Kcal:

> In many countries there are women for whom the burden of pregnancy is added to the physical work of running a home and caring for several small children. Such women need additional food to meet all the energy requirements of pregnancy....
> Previously an allowance of 40,000 Kcal (170 MJ) per pregnancy was recommended for calculating the energy requirements of countries. However a safe level of energy intake is a basic requirement to insure satisfactory nutrition for the fetus and breastfed infant. The present committee, recognizing that this recommendation differs from other estimates for energy that are average requirements recommends 80,000 Kcal (335 MJ) for pregnancy....

Table 1. Adult Female Recommended Daily Dietary Allowances:[a]

Percentage of Adult Non-Pregnant Daily Recommended Dietary Allowance Needed in Pregnancy and Lactation

Nutrient	Rec. Non-Preg.* Allowance	% Needed in* Pregnancy	% Needed in Adolescent Pregnancy	% Needed for Lactation at ages*			
				11-14	15-18	19-22	23-
Energy (Kcal)	2000	115	c	145	130	130	12
Protein (gm)	46	165	d	139	148	144	14
Vit. A (RE)[b]	800	125	625	150	150	150	15
(IU)	4000	125	na	150	150	150	15
Vit. D (IU)		400	400	400	400	400	40
Vit. E (IU)	12	125	117	125	125	125	12
Vit. C (Ascorbic Acid) (mg)	45	133	133	178	178	178	17
Folic Acid (mg)	400	200	300	150	150	150	15
Niacin (mg)	13	115	123	154	138	138	13
Riboflauin (mg)	1.2	125	142	150	158	158	14
Thiamen (mg)	1.0	140	140	150	140	140	13
Vit. B 6 (mg)	2.0	125	125	125	125	125	12
Vit. B12 (mg)	3.0	133	133	133	133	133	13
Calcium (mg)	800	150	150	150	150	150	15
Phosphorous (mg)	800	150	300	150	150	150	15
Iodine (mg)	100	125	140	150	150	150	15
Iron (mg)	18	100+	100+	100	100	100	10
Magnesium (mg)	300	150	150	150	150	150	15
Zinc (mg)	15	133	133	167	167	167	16

a) Based on North American women.

b) Retinal Equivalent (replaces IU as the standard measure of Vit. A. activity)

c) Figures given in terms of Kcal/kg; teenage daily allowance = 40.
adult pregnant daily increase per kg = 5.
adolescent pregnant daily increase = 45.

d) Figures given in terms of Kcal/kg; teenage pregnant increase 1.3.
adult pregnant increase per kg .4.

* From Food and Nutrition Board, National Research Council, National Academy of Science, Recommended Dietary Allowances, 8th ed. (Washington D.C.; Government Printing Office, 1974), Table 7.3 and B.S. Worthington et al., Nutrition in Lactation and Pregnancy (St. Louis: C.V. Mosby, 1977), Table 3.3.

> During 6 months of lactation the energy requirement is about 135,000 Kcal (565MJ). If the pregnant woman has laid down fat according to the full allowance for pregnancy, she has a reserve of about 36,000 Kcal (151 MJ) that will be available for lactation. The additional energy requirement for lactation would then be 100,000 Kcal (415 MJ) or about 550 Kcal (2.3 MJ) per day. Mothers with less stored fat need a correspondingly greater food intake during lactation, as do women who continue breastfeeding beyond 6 months.[4]

Note that the authors of this report do not speak of women with concomitant "full"-time employment outside the home, nor do they address the needs of Nigerian women who breastfeed often three to four times as long as this report mentions.

What are appropriate nutritional requirements for the women we will be discussing? What are the costs of pregnancy and prolonged lactation to women of multiple stress, who have many children, long lactations, heavy financial responsibility, do heavy physical work, are sometimes very young and are living in a disease-ridden environment where good quality protein is in short supply? These costs must be higher for Nigerian women than those portrayed in table 1, which are based on the needs of sedentary and, relatively speaking, privileged North American women.

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[4]FAO AdHoc Committee, Nutritional Requirements of Pregnancy, 1973, pp. 35-36.

In 1964 Michael Latham wrote of maternal nutrition "among the poorer socio-economic groups who form 95 per cent of the African population,"

> Pregnancy can be regarded as a physiological process, but it has very definite pathological potential. It could ... be argued that menstruation itself is an abnormal condition.... Life would consist of pregnancy, birth and lactation from the menarche to the menopause.... Certainly in Africa, pregnancy and lactation occupy many years of a woman's life and therefore have a very marked effect upon her nutritional requirements and status....
> Relatively little is known of the clinical or pathological features of protein deficiency of adults; yet the protein intake of pregnant and lactating mothers in Africa is often extremely low.... Physicians frequently see the "wreck of a woman" following frequent pregnancies on an unsatisfactory diet. She is usually thin, miserable, anemic and often apathetic, with a dry scaly skin, sometimes rather lusterless hair, often with an ulcer that is reluctant to heal, and some mouth lesions. She is labelled in the clinic as a case of "general malnutrition," "multiple deficiency." There is no universally adopted term for this syndrome, nor a sure guide to its diagnosis; is it not, in fact, caloric protein deficiency disease of adults?[5]

[5]M.C. Latham, "Maternal Nutrition in East Africa," Journal of Tropical Medicine and Hygiene, Vol. 67, No. 4 (April 1964): 90-91.

These same conditions were discussed in a 1975 article by Henrich Vis and others:

> Women suffer from general endemic malnutrition which is intensified because they assume the burdens of most agricultural work and because their childbearing years are one long uninterrupted pregnancy and nursing experience.... In the Central African interlakes region, protein-calorie deficiency typically appears between 3½ to 4 years of age or later. It is, however, not at all unusual to find adults and nursing mothers displaying clinical and biological signs of marasmus kwashiorkor.[6]

Unfortunately no data on such cases were presented.

This paper uses data from the Nigerian Migration Project as a basis for creating indices for determining the extent of time women spent either pregnant or breastfeeding and for exploring possible measurements of the burdens associated with women's reproductive and economic roles in a real world situation.

Data and Indices

The Nigeria Migration Project (NMP) data includes four sample surveys--three urban and one rural. The data used here aredrawn from only the urban surveys, which were carried out in 1973 and 1974 in Abadan, Benin, and Kano. While the Project was originally designed as

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6 Henrich Vis, Michael Bossuyt, Philippe Hennart, and Michel Carael, "The Health of the Mother and Child in Rural Central Africa," Studies in Family Planning, Vol. 6, No. 12 (Dec. 1975).

a migration survey, it was set up in such a way as to be useful as a general population sample. Sampling frames were developed from recent aerial photos and the resultant urban samples were multistage probability cluster samples of households. Within selected households all individuals, male and female, aged 15 and above, were interviewed. (Details of sampling and response are given in Appendix A.) Of the three samples, the Benin sample deviated most from desirable sampling procedure (because of decisions made in response to field realities); the sample therefore probably underrepresents the high density areas of the city. Given the lack of reliable public census information for the three cities, it is not possible to estimate the representativeness of the three urban samples.

The NMP data set was structured around a short basic questionnaire which stressed factual information: background social and demographic characteristics, migration histories, employment-unemployment histories, and marital and pregnancy histories. A 20 per cent subsample received an additional longer and more detailed questionnaire, which asked for information on family-size attitudes and practice (KAP questions), health care, household economics, job search, and migration and work histories. It is from this subsample that the information for the economic role responsibility index used here is drawn. The pregnancy and lactation information is available for all respondents. Questionnaires were administered in local languages by trained secondary school graduates and university students. Sample size and questionnaire breakdown are shown in table 2 below:

Table 2. Sample Size and Basic-Detailed Questionnaire Breakdown

Sample	Short Questionnaire	Long Questionnaire	Total	Long Questionnaire as Percentage of Total Collected
Ibadan	1086	240	1326	18.1
Benin	631	161	792	14.7
Kano	777	128	905	20.5

The Indices

The data gathered made it possible to consider the idea of creating indice women's "burden" in areas of physical and nutritional stress associated with the total childbearing role and the economic responsibilities of the woman's familial/domestic role.

The Index of physical and nutritional stress relates directly to the wear and tear and physical work of pregnancy and lactation. The index measures quite simply the proportion of a woman's reproductive life to date spent either pregnant or breastfeeding. The basic unrefined index is defined using available NMP data as:

$$\frac{\text{Total months spent lactating + Total months pregnant}}{\text{Length of reproductive life (Current age - age at first birth)}} \times 100$$

Details of index construction are given in Appendix B.

It should be noted that some problems were encountered in applying the index to the data:

1. Age distribution effects. The index does not take into account the declining fecundity and eventual infecundity at menopause of older women and therefore overstates their burden by including years that are less likely to be involved with pregnancy or lactation. By the same token, the relative burden of younger women is understated. This is evident in the results.
2. Distortions in the time and age data. Both were carefully checked in interviewing and editing stages but memory problems inevitably remain. Some cases could not be included in the analysis due to lack of sufficient age data. (See Appendix C.)

The Index of household economic responsibility was constructed using responses to a series of questions on who paid for certain categories of costs--housing, food, and clothing for self, spouse, and children. By scoring the responses to each item 100 if the woman paid, 0 if anyone else (husband or others) paid, and 50 if "both" paid, we are able to express the extent of the woman's economic responsibility in the household as a percentage of a possible total of 500 points. (See Appendix D for a comparison of male and female responses to these questions.)

This index is admittedly rather crude. Initially, it had been hoped that an index of occupation could be constructed, using hours per day and days per week worked, but the data were inadequate for such an analysis. Therefore it was decided to use data on economic responsibility at the household level. These data have some shortcomings; they reflect reported expenditure patterns, but do not give any indication of women's need, occupation, or amount of effort needed to make the particular contribution. They may not accurately reflect actual patterns of payment, given the reporting bias commonly associated with income data and the assignment of constant,arbitrary, all-or-nothing amounts in the index.

While all income-related data is of questionable quality, it was hoped that presentation of these data, along with the basic data on the "who paid for what" questions (Appendix D), would encourage better data collection for similar analyses by other researchers.

Measurement of Relative Burdens

While controlling for both age and cultural setting, women in both indices were divided into three groups: the bottom 50 per cent, the 51 per cent to 74 per cent, and the top 25 per cent, to indicate average, medium-high, and high nutritional stress or economic burden.

These relative burden indices were then cross-tabulated with each other and with variables related to 1) socioeconomic change or opportunity for change (education and occupation), and 2) life conditions/status in

marriage (age at marriage, monogamy, polygamy, and number of times married), in order to see how life experiences of women have affected their chances of ending up in the various burden groups.

Findings

Table 3 shows the distribution of all women aged 15 and over on the basic nutritional stress index by current age. The table includes women who have not had a pregnancy-- they are at 0 percentile and heavily influence the 15-24 age distributions. According to this table it is women aged 25-34 who fall most often into the highest stress ranges, spending more than 60 per cent of their time either pregnant or lactating. The proportions of women over 35 in the heaviest stress groups is lower, and these women are distributed all along the index. In the Kano sample there are fewer women of all ages in the higher stress groups, and higher proportions at 0. This reflects a situation of lower fertility in Kano, where there is evidence of infertility and subfecundity, possibly associated with the very early ages at marriage,[7] and gynaecologic problems related to prolonged consequent early and often unattended labors, preferred cross-cousin marriages, and venereal and other diseases.[8]

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[7] Approximately half the Kano sample marry before age 14.

[8] See Adadeuch in Infertility and Subfecundity in Africa. Ibadan 1975.

Table 3. Index of Nutritional Stress for All Women By Current Age

Current Age	Percentage of Adult life pregnant or breastfeeding							
	0%	1-20%	21-40%	41-60%	61-80%	81-100%	Total	N
IBADAN								
Total	42.6	2.8	7.5	14.9	17.0	15.1	99.9	709
15-24	81.9	-	.7	2.8	6.9	7.6	99.9	288
25-34	11.6	2.6	6.1	19.8	29.8	30.2	100.1	232
35 +	6.4	8.5	25.5	33.3	19.2	7.1	100.0	141
DK	61.2	4.1	2.0	10.2	10.2	12.3	100.0	49
BENIN								
Total	37.1	5.3	9.1	15.6	15.9	17.0	100.0	453
15-24	76.3	-	-	4.2	6.2	13.4	100.1	194
25-34	4.2	6.3	12.7	19.8	27.5	29.6	100.1	142
35+	4.8	14.3	21.9	30.4	20.0	8.6	100.0	105
DK	75.0	-	-	8.3	16.7	-	100.0	12
KANO								
Total	54.3	5.4	11.1	8.1	11.2	9.9	100.0	595
15-24	76.1	.6	2.6	4.5	7.9	8.2	99.9	314
25-34	33.5	5.4	13.8	13.2	18.6	17.4	100.1	167
35+	22.0	19.2	32.1	10.1	12.8	3.7	99.9	109
DK	80.0	-	-	20.0	-	-	100.0	5

Table 4 shows the distribution along the nutritional stress index of only women who have had a pregnancy. It shows that the 15-24 age group is under very heavy stress: 42.4 per cent of the women in Ibadan, 56.5 per cent of those in Benin, and 34.7 per cent of those in Kano in that age group have spent over 80 per cent of their adult lives to date pregnant or lactating. Of course they are just beginning--they have not yet lived very long in their reproductive lives. What is clear is that once they have begun, most are under heavy nutritional and physical stress. By age 25-34 the proportions in the over 80 per cent category have dropped, but still a third of the women in Ibadan and Benin and a quarter of the women in Kano spent 80 per cent or more of their adult lives actively involved in reproduction. Over age 35, with declining fecundity and eventual menopause, the situation improves, but still 28 per cent, 30 per cent, and 21.1 per cent of the women over 35 in Ibadan, Benin, and Kano, respectively, have spent at least 60 per cent of their adult lives physiologically involved with motherhood and therefore under nutritional and physical stress.

Nigerian women are spending extremely long periods of time under the nutritional stress associated with their total childbearing-mothering role. This point is made in table 5, which shows the nutritional stress index in terms of years spent pregnant or breastfeeding.

Table 4. Index of Nutritional Stress for Women With at Least One Pregnancy, By Current Age

Current age	Percentage of Adult Life Pregnant or Breastfeeding						
	1-20%	21-40%	41-60%	61-80%	81-100%	Total	N
IBADAN							
Total	4.9	13.0	26.0	29.8	26.2	99.9	407
15-24	-	3.8	15.3	38.5	42.4	100.0	52
25-34	2.9	6.8	22.4	33.6	34.1	99.8	205
35+	9.1	27.3	35.6	20.4	7.6	100.0	132
DK	10.5	5.3	26.3	26.3	31.5	99.9	19
BENIN							
Total	8.4	14.4	24.9	25.3	27.0	100.0	285
15-24	-	-	17.4	26.0	56.5	99.9	46
25-34	6.6	13.2	20.5	28.7	30.9	99.9	136
35+	15.0	25.0	32.0	21.0	7.0	100.0	100
DK	-	-	100.0	-	-	100.0	3
KANO							
Total	11.8	24.2	17.6	24.6	21.7	99.9	272
15-24	2.6	10.7	18.7	33.3	34.7	100.0	75
25-34	8.1	20.7	19.8	25.2	26.1	99.9	111
35+	24.7	41.1	12.9	16.4	4.7	99.8	85
DK	-	-	100.0	-	-	100.0	1

Table 5. Years spent Pregnant or Breastfeeding

Years	Ibadan		Benin		Kano	
	N	%	N	%	N	%
1 - 3	283	28.9	163	26.8	199	34.6
4 - 5	186	19.5	123	20.2	117	20.3
6 - 7	169	17.8	73	12.0	97	16.8
8 - 9	111	11.7	63	10.3	72	12.5
10 - 14	103	16.1	123	20.2	59	10.3
15 - 20	37	3.9	50	8.2	20	3.5
21+	11	1.2	14	2.3	11	1.9
	950	100%	609	100%	575	99.9%
1 - 5	469	48.4	286	47.0	316	54.9
6 - 9	280	29.5	136	22.3	169	29.3
10+	201	21.2	187	30.9	90	15.7
	950	100%	609	100%	575	99.9%

Women of all ages are included in table 5--some women have not yet completed all the years of pregnancy and breastfeeding that await them. Still 15 per cent of women in Kano, 21 per cent in Ibadan, and 30 per cent in Benin spent more than ten years pregnant or breastfeeding. These figures are probably underestimated. Many women were dropped from the analysis because of insufficient data on ages and dates. The women who cannot give ages or dates accurately (or at all) are likely to be older and/or less educated and may thus have higher fertility and longer periods of lactation.

Economic Responsibility Index

Table 6 shows the distribution of all women 15 and over for whom we had information necessary to construct the economic responsibility index. The cultural differences between the samples are quite evident: Ibadan (Yoruba) women are more likely to have economic responsibility in the household. Only 23 per cent of Ibadan women pay for nothing in their households, as compared to 47 per cent of the Benin women and 56 per cent of the Kano women. Most women in the Ibadan and Benin samples bear between 20 per cent and 40 per cent of the economic responsibility for their households, whereas in Kano the most common group is 1 per cent to 20 per cent. All three samples have women in the 80 per cent and over group; surprisingly, Kano has the highest proportions in this high economic responsibility group at all ages.

Economic responsibility varies by age, being lowest in the 15-24 age range, probably due to the influence of women still in school and dependent. Still, 13 per cent of the women in both the Benin and Kano samples in this age range are predominantly responsible for the economic support of their households. The 24-34 age group are more likely than the younger women to carry household economic responsibility, but the majority still assume less than 40 per cent of the household expenses. Over age 35, women in all areas come under greater economic stress; in Ibadan and Benin the proportions not assuming any economic responsibility decline and more women move into the over 60 per cent group. In Kano the proportions of women who have no economic responsibility increase at ages over

35 to 60 per cent, but another large group--22 per cent--assume more than 60 per cent of the economic responsibility for their households, and 11 per cent are carrying over 80 per cent of the household expenses.

Table 6. Index of Household Economic Responsibility, By Current Age

Current Age	Household expenses paid by women 0%	1-20%	21-40%	41-60%	61-80%	81-100%	Total	N [a]
IBADAN								
Total	23.1	17.6	41.2	8.5	5.5	4.0	99.0	199
15-24	47.8	21.7	21.7	6.5	2.2	-	99.0	46
25-34	16.7	15.3	48.6	12.5	2.8	4.2	100.1	72
35+	14.3	16.0	44.6	7.1	12.4	5.4	99.8	56
BENIN								
Total	47.4	12.5	21.0	3.9	5.9	9.2	99.9	152
15-24	63.9	6.5	11.5	3.3	1.6	13.1	99.9	61
25-34	45.0	17.5	25.0	-	5.0	7.5	100.0	40
35+	23.1	15.4	30.8	10.2	12.8	7.7	100.0	39
KANO								
Total	56.3	21.8	5.0	2.5	2.5	11.7	99.8	119
15-24	60.3	20.7	3.4	-	1.7	13.8	99.9	58
25-34	48.7	30.7	5.1	-	5.2	10.2	99.9	39
35+	61.1	11.1	5.6	-	11.1	11.1	100.0	18

[a] N's here are smaller than in previous tables because these data are for the 20 per cent subsamples.

Relative Burden Indices

As was described above, the distribution of women on both indices were divided into three parts, the bottom 50 per cent of women (average), the middle 25 per cent (medium-high), and the top 25 per cent (high), stratifying first by age and sample, in order to get an idea of where groups of women stood relative to their peers in the same age and culture groups. Age is an important control here, given the life cycle effects of both fertility and economic role. Their position on the nutritional stress index was then cross-tabulated with their position on the household economic responsibility index. The results, shown in table 7, indicate that considerable proportions of women are in the high burden groups in both these areas of their lives. Almost a third of the Ibadan and Benin women and half of the Kano women in the highest nutritional stress groups are also in the highest household economic responsibility groups. Forty-eight per cent of the women in the highest nutritional stress group in Ibadan, 43 per cent in Benin, and 68 per cent in Kano have medium-high and greater economic role responsibilities.

Unfortunately cell sizes are very small, and further comparative analysis of these two indices would not yield reliable findings. However, it is possible to analyze each index separately to see how socioeconomic and status factors influence the degree of nutritional or economic stress.

Table 7. Relative Burden Indices: Nutritional Stress by Household Economic Responsibility

	Nutritional Stress Group	Household Economic Responsibility Group High	Med-Hi	Average	%	N
IBADAN						
	High	28.6	20.6	51.4	100.0	(35)
	Medium-high	11.8	41.2	47.1	100.1	(17)
	Average	18.6	27.9	53.5	100.0	(43)
BENIN						
	High	28.6	14.3	57.1	100.0	(21)
	Medium-High	13.3	26.7	60.0	100.0	(15)
	Average	35.8	5.7	58.5	100.0	(53)
KANO						
	High	45.5	22.7	31.8	100.0	(22)
	Medium-High	-	44.4	55.6	100.0	(9)
	Average	18.8	10.4	70.8	100.0	(48)

Tables 8 and 9 present the results of cross-tabulating each of the relative burden indices to a series of such variables; marital situation, education, occupation.

Factors Affecting Nutritional Stress

The relationship shown between age at marriage and relative nutritional stress in table 8 is most interesting when the age groups with adequate cell size (ages 15-19 and 20-24 in Ibadan and Benin and 10-14 and 15-19 in Kano) are compared. Women who have married at earlier ages are more

Table 8. Relative Nutritional Stress Burden by Selected Status-Related Variables

	IBADAN Nutritional Stress Group					BENIN Nutritional Stress Group					KANO Nutritional Stress Group				
	High	Med-Hi	Ave	Total	N	High	Med-Hi	Ave	Total	N	High	Med-Hi	Ave	Total	N
Age at first marriage															
10-14	25.0	12.5	62.5	100.0	(8)	41.7	25.0	33.3	100.0	(12)	31.9	10.6	57.5	100.0	(226)
15-19	41.4	12.6	46.0	100.0	(174)	36.1	18.0	45.9	100.0	(194)	25.7	17.3	56.9	99.9	(202)
20-24	32.2	28.8	39.0	100.0	(205)	23.2	22.0	54.9	100.1	(82)	35.1	18.9	45.9	99.9	(37)
25+	15.7	21.6	62.7	100.0	(51)	20.0	26.7	53.3	100.0	(15)	16.7	33.3	50.0	100.0	(6)
Marital Arrangement															
Monogamous	33.4	22.7	43.9	100.0	(326)	32.4	17.8	49.8	100.0	(247)	30.1	14.8	55.1	100.0	(365)
Polygamous	28.8	14.4	56.9	100.1	(160)	31.4	18.6	50.0	100.0	(86)	22.6	11.4	65.7	100.0	(137)
Number of times married															
1	2.3	2.3	95.5	100.1	(221)	1.7	1.7	96.5	99.9	(115)	3.2	1.1	95.7	100.0	(94)
2	33.4	18.6	48.0	100.0	(425)	32.9	18.6	48.5	100.0	(295)	30.2	12.7	57.1	100.0	(410)
3+	21.0	24.2	54.8	100.0	(62)	23.3	16.3	60.5	100.1	(43)	18.7	20.9	60.4	100.0	(91)
Education															
None	27.6	15.2	57.2	100.0	(250)	25.7	19.3	55.0	100.0	(140)	28.0	10.8	61.3	100.1	(93)
Primary Koranic	24.6	15.8	59.6	100.0	(285)	29.3	15.3	55.3	99.9	(215)	24.9	12.5	62.6	100.0	(465)
Secondary +	12.1	9.2	78.7	100.0	(174)	10.2	4.1	85.7	100.0	(98)	5.4	10.8	83.8	100.0	(37)
Occupation last 3 mos.															
Housewife	19.1	10.0	70.9	100.0	(251)	25.6	15.2	59.3	100.1	(270)	24.3	12.6	63.1	100.0	(404)
Traders	27.0	19.8	53.2	100.0	(252)	29.3	17.3	53.3	99.9	(75)	30.7	19.3	50.0	100.0	(88)
Unskilled/Service	4.8	-	95.2	100.0	(21)	8.3	8.3	83.3	99.9	(12)	16.7	1.7	81.7	100.1	(60)
Large-scale commercial	35.1	10.8	54.1	100.0	(37)	30.0	10.0	60.0	100.0	(10)	-	-	100.0	100.0	(2)
Skilled Modern Sector	29.3	12.2	58.5	100.0	(41)	17.6	8.8	73.5	99.9	(34)	22.2	-	77.8	100.0	(26)
Clerk/Low Prof.	10.0	12.5	77.5	100.0	(40)	5.6	-	94.4	100.0	(18)	-	-	-	100.0	(3)
Medium-High Prof.	17.3	19.2	63.5	100.0	(52)	15.4	11.5	73.1	100.0	(26)	22.2	-	77.8	100.0	(9)

likely to be found in the high nutritional burden groups. It is also interesting to note that higher proportions of Ibadan women are in the high burden groups (41.4 per cent of those aged 15-19 at first marriage) as compared to Benin (36.1 per cent) and Kano (25.7 per cent) even though other data from the Nigeria Migration Project show that Ibadan has a higher level of development than Benin and Kano, higher rates of female education, and higher female labor force participation. Fertility is high there, although that of Benin is higher. However, other analyses of NMP data have shown indications of a decline in age at marriage over time.[9]

The data shown for the relationship between the kind of marriage and nutritional stress are the same as those for fertility-polygyny differentials generally--inconclusive. In these data there is little difference between monogamous and polygynous women. Still, in Ibadan and Kano being monogamous gives a woman a greater change of being in a higher burden group. Even if monogamous women are likely to be better educated, and younger, than polygynously married women, they are spending more time than their polygynous peers involved with reproduction. This may be a reflection of the role of sterility and sub-fecundity in fostering polygyny; perhaps it is the presence of higher proportions of childless wives among the polygynously married women that accounts for their relatively low proportions in high nutritional burden groups.

The number of times married variable shows an expected pattern: more marriages, lower nutritional stress. Not only may marital turnover depress overall fertility by reducing periods of exposure to intercourse,

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[9] See Judith A. Harrington, "Education Female Status and Fertility in Nigeria," paper presented to Population Association of American Meetings, Atlanta, Georgia, 1978.

but the divorced woman is also more likely than the average woman to be infertile--hence her divorce.

The education differentials confirm earlier NMP analyses: the difference between the reproductive activity (broadly defined here to include lactation) of uneducated and primary-koranic educated groups is minimal; it is the secondary level education that lowers the nutritional burden.[10] Fertility differentials studied in one earlier analysis showed some declines with secondary education, but the inclusion of lactation makes the differences clearer here. Of course, the higher education category includes more younger women who have not yet begun their fertility than do other education categories, thus their proportions in high burden groups are also decreased.

The occupation differentials indicate that housewives have higher proportions in the average burden groups than do those in other occupations, with Ibadan being more favorable for housewives than other areas. "Housewife" is a deceptive category, however, and it would be unwise to press these data. Traders tend to slightly higher proportions in the high nutritional burden categories than do women in other occupations; and a third of the women in large-scale commercial occupations are in the high burden group. Most women in these two latter occupations may be able to take their child to work with them during infancy and therefore may breastfeed for longer periods of time.

The unskilled and service sector women end up largely in the average nutritional burden categories because they are likely in these data to be either domestic servants or prostitutes. Both tend to be

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[10] Ibid., pp. 9-14

young and have low fertility, which may be partly either a cause and/or consequence of their occupations.

Women in the modern sector at both professional levels have greater proportions of their women in the average burden groups. "Modern" sector employment has probably reduced the lengths of lactation, if not fertility itself.

Factors Affecting Relative Household Economic Burden

Table 9 presents the relative household economic burden results. Unfortunately these results are based on smaller n's, and some comparisons are not possible. Age at first marriage indicates that women who were older at first marriage have higher proportions in the medium-high and high economic role groups--probably because educated women marry later and assume heavier economic roles than their less educated peers.

Polygynously married women, while they may be less likely to be in the high relative nutritional burden groups than the monogamously married, are more likely to be in the high and medium-high relative economic burden groups. For men, polygyny may mean higher status; for women it means that, whatever their status, they are more likely to have to support themselves and their children.

Number of times married shows unmarried women having greater proportions in the high economic role groups than women married only once. All cell sizes are quite small here, except in Benin, but it is interesting that sizable proportions of never-married women have high economic role

Table 9. Relative Household Economic Burden by Status-Related Variables

	IBADAN Economic Burden Group					BENIN Economic Burden Group					KANO Economic Burden Group				
	High	Med-Hi	Ave	Total	N	High	Med-Hi	Ave	Total	N	High	Med-Hi	Ave	Total	N
Age at first marriage															
10-14	-	-	100.0	100.0	(1)	25.0	-	75.0	100.0	(4)	25.7	22.9	51.4	100.0	(35)
15-19	22.7	20.5	56.8	100.00	(44)	18.4	12.2	69.4	100.0	(49)	22.9	22.9	54.2	100.0	(48)
20-24	27.3	37.7	35.1	100.1	(77)	20.7	31.0	48.3	100.0	(29)	33.3	16.7	50.0	100.0	(12)
25+	-	30.8	69.2	100.0	(13)	20.0	40.0	40.0	100.0	(5)	-	-	100.0	100.0	(2)
Marital arrangement															
Monogamous	22.5	27.1	50.4	100.0	(129)	20.2	19.0	60.7	99.9	(84)	24.2	18.9	56.8	99.9	(95)
Polygamous	25.0	33.9	41.1	100.0	(56)	27.5	25.0	47.5	100.0	(40)	27.8	22.2	50.0	100.0	(18)
Number of times married															
)	25.0	12.5	62.5	100.0	(8)	42.3	3.8	53.8	99.9	(27)	44.4	-	55.6	100.0	(9)
	22.0	30.4	47.6	100.0	(168)	21.5	20.6	57.9	100.0	(107)	24.0	18.8	57.3	100.1	(96)
'+	36.4	18.2	45.5	100.0	(22)	26.3	21.1	52.6	100.0	(19)	21.4	28.6	50.0	100.0	(14)
Education															
lone	26.5	20.6	52.9	100.0	(102)	24.1	24.1	51.7	99.9	(58)	27.8	22.2	50.0	100.0	(18)
'rimary-Koranic	14.1	35.9	50.0	100.0	(64)	19.4	11.9	68.7	100.0	(67)	22.6	19.4	58.1	100.1	(93)
econdary +	33.3	36.4	30.3	100.0	(33)	44.4	18.5	37.0	99.9	(27)	50.0	-	50.0	100.0	(8)
Occupation last 3 mos.															
lousewife	6.9	15.5	77.6	100.0	(58)	14.6	11.5	74.0	100.1	(96)	19.1	17.0	63.8	99.9	(94)
nskilled/Service	-	-	100.0	100.0	(3)	100.0	-	-	100.0	(3)	100.0	-	-	100.0	(2)
raders	30.3	31.5	38.2	100.0	(89)	35.7	32.1	32.1	99.9	(28)	31.3	31.3	37.5	100.1	(16)
arge-scale commercial	25.0	37.5	37.5	100.0	(8)	-	-	-	-	-	-	-	-	-	-
killed Modern Sector	8.3	50.0	[illegible]	100.0	(12)	30.0	20.0	50.0	100.0	(10)	50.0	50.0	-	100.0	(2)
lerical/Low Prof.	25.0	50.0	25.0	100.0	(4)	60.0	40.0	-	100.0	(5)	100.0	-	-	100.0	(1)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	100.0	(9)	66.7	-	33.3	100.0	(3)

responsibility. These are not women going from dependence upon a father to dependence on a husband. For women married twice or more, the proportions in the high economic burden groups rise, particularly in Ibadan. In Kano, where divorce is culturally more common and better accepted, women in this marital category tend to be in the medium-high burden group. The greater economic responsibility of women married more than once may represent a deterioration in their status and an increase in their vulnerability, or it may reflect a increased economic activity with age and perhaps more power in the marriage.

The education results are most interesting: Primary and Koranic educated women are less likely than others to be found in the higher household economic burden groups. Both the uneducated and the more educated women are the ones most likely to be found in the high and medium-high burden groups. The secondary educated women are least likely of the three groups to be found in the lowest household economic burden groups. Their education may keep them out of the high nutritional burden groups, but it places them securely under the burden of economic responsibilities.

The occupation results further reflect the basic education findings: traders, large-scale commercial dealers, and modern sector professionals are all more likely to be found in high and medium-high household economic groups than in the average group. Cell sizes are small, so caution is necessary, but generally the proportions in the average group for working women are low. However, perhaps the most important finding is the

proportion of reported housewives who have medium-high and high economic role responsibilities. In Kano 19 per cent of the women who are housewives are in the high household economic burden group, and another 17 per cent are in the medium-high group. Obviously the women reporting themselves as housewives need greater scrutiny.

Discussion

The physical and health costs of many pregnancies have been widely discussed in the literature; what has not been fully recognized is that the lactation period is almost always longer and certainly more costly in nutritional demands than the pregnancy itself. It would be appropriate on the basis of the findings presented here to redefine the reproductive role and the costs and benefits associated with it to include lactation. Certainly before advising women in the Third World to breastfeed for long periods of time in order to keep children alive or to space births, we need to evaluate more directly the maternal costs involved. This is not to say that bottlefeeding is the solution. Breastfeeding for between six months and a year is not only desirable, but in many cases it is necessary for child survival. However, if women breastfeed they should be given "room" by the society to do so. Beyond the initial six months to one year period of lactation, the larger community should recognize its responsibility for nurturing and feeding its children. Women should not have to do it at the cost of their physical well-being.

Children over a year old do not need powdered milk in bottles; they need a varied, affordable, constantly available, protein-rich food supply. Nigerian adult diets already include a variety of iron-, protein-, and vitamin-rich foods, such as groundnuts, beans, green leaves, smoked and dried fish, fruits, rice, millet, and sorghum. They are available but expensive in local markets. I would suggest that what is needed is a program to encourage the processing of these indigenous foods for toddlers and infants. Such an approach would be in line with current Nigerian Government policies and initiatives, which focus entirely on local foodstuffs and encourage agricultural production through investment concessions. Women already predominate in the areas of food growing (of the type most needed--raising small animals and garden crops) as well as in food processing and marketing. That they have been spending so many years lactating to keep their children alive shows that they certainly have high motivation for ensuring child welfare. Their economic motivation is legendary. Education in nutrition and other areas needed to make processing and marketing a vigorous economic activity could help women control and develop a market that benefitted them directly, as well as earned for them the income needed to buy such products.

There would be many problems to solve in such a venture--water shortages, parasites that drain off nutrients that are consumed, lack of organization. But there is also much that is promising. Market women's associations and savings clubs could be used to disseminate information and to organize further market activity. Problems of transport exist but have in the past been solved successfully by others,like the Hausa dealers in Kola nuts who

ship their perishable produce by truck on the basis of word-of-mouth reports of market shifts.[11] International agencies might help with credit and with needed technology for storage and processing and packaging at a scale appropriate to the smaller village markets, and with investigations of the protein complementarity of indigenous foods.

There is a role here for family planning, too. The figures on nutritional stress have to raise questions about the heavy physical cost of bearing and rearing many children. However, since the greater physical burden in terms of time and intensity of nutritional stress is associated with lactation rather than with pregnancy itself, policies that speak specifically to the difficulties of feeding the children that are born are also needed. One thing is certain: policies that seek to lower fertility by raising the costs of children are particularly inappropriate. In a situation such as this, they might even be termed sadistic, since they simply add to the burdens of already overburdened women. Reproduction is, after all, necessary for the maintenance of society. At whatever level the society, or the individual in it, plan to reproduce, women should not be made to bear the double brunt of both reproduction and "disincentives" for fertility. Since ultimately society needs new members, and women are the only ones to provide them, let us regulate the level of reproduction at some point other than by squeezing these women between obligations. We should consciously plan to alleviate their stress by more appropriately supportive policies that see children as future adults and

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[11] See Cohen, Custom Politics in Africa for a most interesting analysis of Kola nut marketing and the Hausa community resident in Ibadan.

citizens deserving of and requiring social and personal investments that will be returned to the society in terms of long-term human development.

The opposition in current conceptualizations of maternal labor force participation and adequate child care is unfortunate. Consider, for example, the tone of the following quote:

> Unlike the practice in other areas, the mother, who does most of the field work, only breastfeeds her child in the morning and evening. (Mothers say that the distance between the home and the fields is much too great.) During the day, the child is with the grandmother or older sister, who feeds him porridges of cassava, bananas and sorghum....
> In other areas of the same tribe children accompany their mothers to the fields and are breastfed on demand. The difference between infants in the two communities lies in the nutritional supply: in one group 80-90 per cent of energy needs are covered; in the other, only 60-70 per cent of protein requirements are met. Where the children are left at home, their nutritional state is precarious, with periodic famine. And the woman on whom falls the responsibility of field work, meal preparation for the whole family, and care of the last born child, must choose between these duties at any given moment. Because her own poorly nourished condition does not permit her to fulfill all the social functions imposed on her, she meets these demands by leaving her child at home. This problem, exceptional in rural Africa, is analogous to that which existed in the eighteenth and nineteenth centuries in Europe: because of overwhelming parental social responsibilities, undesired children were neglected.[12]

[12]See Vis et al., "Health of Mother and Child."

It is unfortunate that these authors interpret this situation as one of maternal neglect of unwanted children. The realities of survival leave these two groups (mothers and children) little choice but to take from one another, at great cost to one another. Both mother and child are in need of and deserve supportive policies that do not pit the mother and the child against one another.

Nigerian women live in a complex, changing, and tenuous economic environment, the vagaries of which are not controlled by them but by weather and natural disasters, by government decree, and by the incursion of new foreign-controlled businesses and modern sector jobs. They must cope with the tail end of the worldwide repercussions of the changing international economic order. What is it like where they sit? The sociodemographic indices discussed here are one reflection of their situation. There are others waiting to be measured. Perhaps the infant mortality rate, a telling refinement which is used as one index of economic development, should be refined to include a measure of the length of lactation still required by the women to maintain a given infant survival rate.

Appendix A

Sampling Frame

The lack of adequate sampling frames for most of West Africa is well known. Aerial photos and derived grid maps were used to select sample clusters which were then located, delineated on the ground, mapped, and fully enumerated. The Ibadan sample made use of 1:2500 grid maps from 1966 aerial photos. A total of 6096 grids were obtained, from which 36 were selected using a table of random numbers. Of these 36, 22 were found on field inspection to have inhabitants and were retained for the enumeration stage. The Kano sample made use of 1:2400 grid map series from 1967 aerial photos. A total of 527 grids were obtained,from which 23 were selected using random numbers. Nineteen of these 23 were found to be inhabited and retained for the enumeration stage. Neither city had any reliable population figures or estimates on which to base a sampling fraction. "Educated guesses" were made in order to sample sufficient clusters to arrive at the desired sample size. In Ibadan and Kano population size was underestimated, so fractions of the enumerated clusters were resampled. In Ibadan three eighthsof the households were selected for interviewing by dividing the list of enumerated households in each sample cluster into equal parts and selecting the desired proportion by coin toss. In the Ibadan case half the list was selected, then that half was broken down into quarters, and one of the remaining quarters was selected for exclusion, leaving three eighths of the original list of enumerated households slated for interviewing.

The Benin sampling process was hampered by failure to locate available aerial photos for the city. However the city is laid out quite regularly, with houses bordering well-defined streets, quite unlike the traditional areas of Ibadan and Kano. Finally, use was made of a 1:10,000 scale grid street map. Grids were enumerated from 1 to 100 and 20 were selected in the first stage of sampling by random numbers. Streets within each sampled grid were then numbered consecutively and two in each grid were selected for full enumeration using random numbers. At this point the sampling process became restrictive, in the sense of representativeness. The streets selected were completely enumerated. In cases where there were fewer than 120 respondents enumerated on a street, all were slated for interview. Where streets contained more than 120 persons, a fraction of the households were selected, using the same listing, division and random selection process prescribed for Ibadan and Kano, to yield a total of approximately 120 persons per street. The decision to put an upper cut-off point on the number interviewed per street means that the sample is underrepresentative of denser areas. However, it was decided that this restriction was preferable to the bias that would be introduced by sampling entire streets, given the fact that since some street ran diagonally across grids, they were of unequal lengths within selected clusters. The fraction actually sampled on the forty streets are given in Table A1 below.

Table A1. Fraction of Households Sampled on Streets Selected for Interviewing: Benin Sample

Number of Streets	Sampling Fraction
10	0 (empty)
16	1 (less than 120 persons)
3	1/2
7	1/3
2	1/4
1	1/5
1	2/15

Nonresponse

Interviewers were required to account for interviews with all enumerated population assigned to them. They were instructed to call back three times before recording a nonresponse. Interviewers were found to be quite zealous about running down interviewees, returning many times beyond the three times required in an effort to establish closure in the area they were working. Some populations, such as taxi drivers, were particularly difficult to track down. Interviewers reported difficulty in meeting such people at home because of the long working hours they kept. Response rates and reasons for nonresponse are given in Table A2. The enumerated population was found to differ from the interviewed population because of specifically determined nonresponse reasons reported below,

bad information provided to original enumerators, and population movements into the area between the enumeration and the interviewing. Out-migration between enumeration and interviewing is accounted for in the nonresponse reports. Figuring nonresponse as those cases identified as appropriate for interview but uninterviewed and the nonresponse rate as those cases divided by the total of persons interviewed plus those appropriate but uninterviewed, we arrive at the following nonresponse rates for the whole samples (male and female): Ibadan 21.7 per cent, Benin 15.7 per cent, and Kano 20.5 per cent.

Table A2. Reasons for Nonresponse

Reason	Ibadan %	Benin %	Kano %
Not available, never met	44.7	38.0	8.7
Refused to Answer	30.7	23.0	3.3
Travelled	8.1	26.0	25.0
Head of Household refused	2.6	1.7	.9
Visitors left	3.3	8.7	22.8
Woman returned home for childbirth	.5	-	-
Language	-	-	4.6
Not Ascertained	7.4	1.3	32.6
Other	2.7	1.3	2.0
Total	100.0%	100.0%	100.0%
Total Nonresponses	646	300	448
Total Interviewed	2327	1612	1723
Nonresponse rate	21.7%	15.7%	20.6%

Appendix B

Construction of Indices:

A. Index of Physical Stress:

$$\frac{\text{Total Length of Physical Stress}}{\text{Total Length of Reproductive Period to Date}} \times 100$$

1. Total Length of Physical Stress in months (total months pregnant + total spent breastfeeding). Total months pregnant were calculated over the pregnancy history of each case using the live birth variable, and assigning the following month values:

Live birth	= 9
Pregnancy lasted 1-3 months	= 2
Pregnancy lasted 4-6 months	= 5
Pregnancy lasted 7 months	= 7
Pregnancy lasted 8 months	= 8
Pregnancy lasted 9+ months But no live birth	= 9

The total months of lactation were then added, this figure being calculated from the length of lactation variables by adding over each individual history and assuming a value of six months for those currently breastfeeding.

2. Total Length of Reproductive Period to Date (current age minus age at first birth expressed in months). If either age variable had a "don't know" response, the birth interval variable was used. This is the length of time between one birth and the next in months. The month values were added across individual histories, calculating the month value for the open-ended interval following the most recent birth by subtracting age at that most recent birth from date of survey.

3. Any case for whom the calculations described above could not be calculated because of Don't Know responses was deleted from the analysis. The proportions of cases for whom it was not possible to calculate the index are given in Appendix C, cross-tabuluted by the variables used in this analysis.

Appendix C

Proportion of Don't Know Responses on
Relative Age Adjusted Physical Stress Index
By Selected Status-Related Variables

Variables	IBADAN		BENIN		KANO	
	%DK	N	%DK	N	%DK	N
Age						
15-24	33.6	(434)	36.6	(306)	33.0	(469)
25-34	39.7	(383)	34.6	(217)	38.1	(270)
35+	49.1	(277)	43.5	(186)	24.8	(145)
Polygyny						
Mono	51.5	(672)	44.9	(448)	40.4	(612)
Poly	55.9	(363)	58.2	(206)	28.6	(192)
Age at 1st Marriage						
10-14	27.3	(11)	40.0	(20)	37.2	(360)
15-19	40.6	(293)	38.2	(314)	32.7	(300)
20-24	39.0	(336)	35.9	(128)	22.9	(48)
25+	28.2	(71)	34.8	(23)	14.3	(7)
Number of times Married						
0	5.6	(234)	4.9	(121)	4.1	(98)
1	53.2	(909)	48.2	(569)	37.9	(661)
2+	50.0	(124)	54.2	(94)	34.5	(91)
Education						
None	60.0	(625)	56.5	(322)	27.9	(129)
Pri-Kor	33.7	(430)	38.0	(347)	36.0	(726)
Sec+	18.3	(213)	14.8	(115)	11.9	(42)
Occupation						
Housewife	35.1	(387)	44.7	(488)	38.0	(652)
Unsk/services	4.5	(22)	14.3	(14)	9.1	(66)
Traders	56.7	(582)	51.6	(155)	28.5	(123)
Commerce lge scale	48.6	(72)	33.3	(15)	33.3	(3)
Sk mod sector	41.4	(70)	22.7	(44)	23.5	(34)
Cler low prof	11.1	(45)	10.0	(20)	40.0	(5)
Med lgr prof						

Appendix D

Responses to Questions on Who Pays for Household Expenses: Comparison of Female and Male Responses

	IBADAN		BENIN		KANO	
	F	M	F	M	F	M
Who pays rent?						
Respondent	7.8	82.4	16.9	74.2	14.0	89.0
Spouse	79.2	1.3	62.5	0.0	72.9	0.0
Both	1.3	2.6	0.7	0.0	0.9	2.0
Other	11.6	13.8	19.8	25.8	12.2	9.0
Total	99.9	100.1	99.9	100.0	100.0	100.0
N	(154)	(153)	(136)	(124)	(107)	(100)
Who pays for food?						
Respondent	12.2	78.8	16.1	76.1	15.1	91.2
Spouse	62.2	0.5	60.4	0.7	76.5	0.9
Both	19.4	14.5	8.7	3.7	3.4	5.3
Other	6.1	6.3	14.8	19.4	5.0	2.6
Total	99.9	100.1	100.0	99.9	100.0	100.0
N	(196)	(193)	(149)	(134)	(119)	(114)
Who buys respondent clothes?						
Respondent	48.2	91.8	30.6	84.8	16.8	93.2
Spouse	19.3	0.5	38.8	0.8	58.8	0.0
Both	26.4	4.1	18.4	1.5	19.3	3.4
Other	6.1	3.6	12.3	12.9	5.0	3.5
Total	100.0	100.0	100.1	100.0	99.9	100.1
N	(197)	(195)	(147)	(132)	(119)	(117)

CHAPTER 3: WOMEN AND HOUSEHOLD STRUCTURES

Households Headed by Females and Urban Poverty in Brazil
Thomas W. Merrick and Marianne Schmink

Households Headed by Women in Third World Countries: An Overview
Mayra Buvinic and Nadia H. Youssef

The Economics of Marriage, Women, and Development
Amyra Shechtman Grossbard

Who Decides: Equality in Husband-Wife Decisionmaking
Everett M. Rogers

The Allocation of Familial Labor and the Formation of Peasant Household Income in the Peruvian Sierra
Carmen Diana Deere

Households Headed by Females and Urban Poverty in Brazil

Thomas W. Merrick
Georgetown University
Marianne Schmink
The University of Texas

Poverty is not a single, simple problem but rather a complex of issues and problems. Close analysis of poor families of the Third World reveals important diversity among groups who share otherwise common characteristics of low income, poor health and nutrition, and lack of other basic needs. Failure to consider such diversity can lead to a misleading assessment of the roots of poverty, which will result in ineffective policies and programs to alleviate it. Special attention to specific poverty groups is coming to be recognized as a major requirement, and we adopt the working premise that a focus on household structure and poverty as a women's issue contributes to this goal. Specifically, we will look at households headed by females, using data from Belo Horizonte, Brazil as a basis for our analysis of the relationship of household structure, human capital endowments and earning capacities. The reasons for using the household, rather than the individual, in analyzing income inequalities are outlined below, followed by a brief discussion of data on households headed by females and of labor market conditions for Brazilian women generally. Having outlined the larger environment in which the study we draw on took place, we then move on to a discussion of the Belo Horizonte data.

Household Structure and Poverty

In an important paper, Kuznets (1976) concluded that for a meaningful analysis of income by size, the recipient unit has to be the family or household and not the individual, and that even then account must be taken of differences in household size and structure and of different phases in the lifetime span of a family's income. He found comparisons of income inequality reflected in conventional measures to be relatively meaningless as long as they were obscured by differences in household structure. Though he concentrated his efforts on empirical illustrations of how distributions were affected by type and size of household and by the age of household heads (as an index of the phase in families' lifetime income span), his work points clearly in the direction of dealing with income inequality and poverty questions in terms of specific subpopulations.

If the issue is viewed from the broader conceptual perspective of "full income," an ever more compelling case can be made for focusing on the household as the unit of analysis. Recent studies of time and labor investments have demonstrated the importance, particularly for poor populations, of home production activities that directly satisfy family consumption and reproductive needs (Cain, 1977; DaVanzo and Lee, 1978; Deere, 1978; Evenson and Quizon, 1978; Stoler, 1978; Szalai, 1972). While such activities are most extensive and visible in rural settings, childcare, home maintenance, and other related tasks also comprise a large proportion of household labor time in cities (Szalai, 1972; Schmink, unpublished time-budget survey data from Belo Horizonte, 1976-77). The measurement of a household's "full income," or overall

standard of living, should thus be based on returns from both home and market production activities; the essential problem to be solved by household economic strategies is that of allocating resources and personnel to the activities related to both components of full income.

Since many productive activities in both home and market settings demand laborers of specific age and sex characteristics, the success or failure of a household's income generation will be largely determined by the "fit" between household composition and the labor-demand structure in both home and market production. While demand is a product of macro-level economic and policy trends and tends to shift only gradually, household structures are highly variable over the family life cycle. Furthermore, many households, especially in low-income groups, do not conform to the nuclear family model and may change their form frequently. Within a given labor-demand structure, therefore, the least successful households will be those whose component members cannot adequately carry out necessary productive activities in both home and market.

An earlier study of Brazilian income inequality and urban poverty using data that will be employed in this paper (Sant' Anna, Merrick, and Mazumdar, 1976) adopted the household as a focus of analysis. Using survey data for Belo Horizonte, that study attempted to determine the extent to which differences in household standards of living could be accounted for by differences in demographic factors (which determine the potential stock of workers and burden of dependency in households) or economic factors (which influence the participation of adults in market activity and their levels of earnings). Analysis of

households by income level showed that economic factors had a greater effect on the household's level of living than demographic factors. Although the burden of dependency was higher at the lower end of the income scale because of a relatively large number of children, the potential stock of adult workers was also significantly higher. Poor households were poor partly because they were unable to utilize as much of this stock as the richer households. While this was particularly true of female secondary workers, even the principal earners (heads) of poor households were characterized by a relatively low level of utilization.

One of the most important conclusions of the analysis was that differences in earnings per worker were quantitatively much more important in accounting for differences in the level of living than were variations in employment rates. Yet these differences in earnings per worker could be explained only in part by earnings functions within the human capital framework, suggesting that other aspects of household structure affected the determination of employment and earnings in ways which could not be attributed to human capital endowments in their strictly economic sense. This indeterminacy of the findings pointed again to the need to look more closely at specific household types within the broader array of poverty households, and a principal objective of the present paper is to reexamine the relation between household structure and poverty in the Belo Horizonte data, with households headed by females broken out as a distinct household type.

Households headed by women are vulnerable to poverty because unpartnered women usually retain the primary responsibility for child-

care and home maintenance tasks; in the absence of a male breadwinner, they face the challenge of making market-oriented activities compatible with these responsibilities. Because women are socialized primarily for family roles and not for an economically active life, they often lack a primary identification with their work roles as well as the training required to achieve comfortable and challenging jobs. Thus women who head households without a male partner face a double burden, for they have to both work and fulfill their responsibilities within the household. How successful these women will be in responding to these challenges will depend upon what jobs are available to household members, how much they pay, and how compatible they are with home production needs.

In this study, we examine labor force conditions for women and trends in households headed by females in Brazil during a period (1950-1970) when there was rapid economic growth as well as a problem of increasing poverty. A more detailed analysis is carried out for the city of Belo Horizonte, which has been an important growth center in recent years.

Background Data: Households Headed by Women and the Labor Market

Brazilian census publications provide only very sketchy information on households headed by women, and as far as we know, no one has worked with special tabulations with this particular focus. Published summary tables include sex of head as a control variable, but cross-

tabulate it with only one other variable at a time, which severely limits analytical work. Table 1 summarizes data on the number of households with female heads reported in the 1950, 1960, and 1970 population censuses. National data are broken down by rural and urban residence and by region.

In 1970, 13 percent of households were headed by women, with urban households much more likely to be headed by women than those in rural areas. The 1970 share is an increase over the 10.7 percent reported in 1960, however the latter represents a decline compared to 1950. The decline may be due to changes in reporting practices. About 15 percent of the female heads of household in 1950 were reported as married. Starting in 1960, married women no longer were classified as heads of household. Some of the affected households may have been shifted to the divorced and separated category. (Divorce became legal in Brazil only in 1977, although separation was permitted).It is possible that separated female heads of household were considered "married" in 1950 but "separated" later on, as attitudes changed. Another possibility is that married women who qualified as heads in 1950 were not so considered later, so that numbers reported in 1960 and 1970 are probably lower than they would have been if married women had been considered heads. The census volumes do not clarify the change in procedure. If we assume that the share of married female heads in 1970 was the same as in 1950, then the 1970 share would increase to 14 8 percent.

The relative increase of female-headed households from 1960 to 1970, when the data are more comparable, indicates that female households account for about 18 percent of the growth of households in the

Table 1. Trends in Female Headed Households in Brazil by Rural-Urban Residence and Region, 1950-1970.

	1950			1960			1970		
	Total (1)	Female Heads (2)	Percent (2/1)	Total (3)	Female Heads (4)	Percent (4/3)	Total (5)	Female Heads (6)	Percent (6/5)
BRAZIL									
Total	10,046,199	1,218,981	12.1	13,352,142	1,449,325	10.7	18,554,426	2,417,365	13.0
Urban	n.a.	n.a.	n.a.	6,374,633	890,080	14.0	10,904,313	1,714,499	15.7
Rural	n.a.	n.a.	n.a.	7,157,509	559,245	7.8	7,650,113	702,866	9.2
REGIONS									
North	346,921	43,321	12.5	448,803	48,427	10.8	631,739	79,003	12.5
Northeast	3,569,691	554,033	15.5	4,239,750	569,062	14.1	5,380,759	860,665	16.0
Southeast	4,333,631	452,387	10.5	6,092,992	597,920	9.8	8,328,869	1,070,989	12.9
South	1,467,059	125,462	8.6	2,211,892	155,936	7.0	3,256,792	298,456	9.2
Central-West	328,897	42,778	13.0	538,705	50,980	9.5	956,267	108,312	11.3

Sources: Population Censuses, 1950, 1960, and 1970.

decade. If we add in households headed by married women, which may have been omitted in 1960 and 1970, then one out of every five households added between 1960 and 1970, was headed by a female.

If we regard the change in the "married" category as definitional and omit it, the increases in female heads of household between 1950 and 1970 are distributed as indicated in table 2.

Table 2. Growth of Female-Headed Households by Marital Status of Head

	Percent		Share of Increase
	1950	1970	1950-70
Single	27.1	19.6	13.8
Separated, Divorced	0.9	25.2	43.6
Widowed	72.0	55.3	42.6

The separated/divorced category immediately stands out. Less than 1 percent of the female heads of household were separated/divorced in 1950, but 25 percent were in that category in 1970. Some of this increase may be due to the change in reporting practice discussed above, but putting that aside, the figures still indicate that the "separated" group increased much more than its proportional share of total female-headed households. This change, whatever its "cause," was the main factor in the overall increase in women heads of household. Increases in the other two groups--single and widowed--were less than proportional to their shares in the total number of households headed by females. The impact of other factors--increases in female labor-force participation (from 13.6 percent on 1950 to 18.4 percent in 1970) and a growing

differential between male and female life expectancy (from a 3.6 year advantage for females in 1950 to 4.3 years in 1970)--was less than that of the increase in dissolution of marital unions by separation.[1]

It is difficult to determine the effect of increases in the number of households headed by females on the overall level of poverty in Brazil because the published census data do not lend themselves to the kind of analysis (controlling for age, marital status, and labor force participation) required in order to identify specific factors. Income data are given only for heads of household, not for the entire household. It can be seen from the census data, however, that a substantially higher proportion of female heads of household report no income (39.8 percent) than do male heads of household (2.5 percent). Of those who reported income, 49.5 percent of the women heads of household fall in the two lowest income classes, compared to 26.6 percent of the men. While income from secondary earners and non-salary income probably account for some of the difference, every indication is that the households headed by females are an important poverty group in Brazil. A brief look at the situation women face in the labor market will provide an indication of some of the reasons for the relative poverty of this group.

[1]Though less dramatic, the trend in Brazil is similar to that in the United States. According to Ross and Sawhill (1975:1), the rate of growth of the number of households headed by females in the United States is ten times that of two-parent households. The precarious financial status of households headed by women has generated growing concern, for whatever their prior income status there is a high risk of poverty for households without a male wage earner. According to Ross and Sawhill (1975:3), almost half are indeed poor, and a similar proportion spend some time on welfare.

Labor Market Conditions for Women

Approximately 80 percent of the working women in Brazil were in the lowest income categories of the population in 1973. Furthermore, a national sample survey of households in that year revealed that one of every ten working women was the head of her household (PNAD 1973, cited in Campos, 1977: 1-2). Yet legal protection for women workers is generally deficient or unenforced.

According to the Labor Law of 1943, firms which employ at least 30 women must provide a day nursery where female employees may keep their children during the nursing period. A deposition to the Parliamentary Inquiry Commission on the Situation of Women in 1977 pointed out that this law provides for childcare only during the six months of the child's life, and that the fine for noncompliance is so miniscule as to be insignificant (Campos, 1977:4). While the data on the availability of childcare in Brazil is scarce, there seems to be no question that the legal requirements are not complied with by a large majority of firms employing women.[2]

In order to avoid their legal obligations, many firms simply fire women when they marry or when they become pregnant. Of the

[2]A survey by the press in 1969 counted "no more than 200 crèches in all of Brazil, concentrated in the three principal cities (Rio de Janeiro, São Paulo, Belo Horizonte) data collected by the Labor and Social Action Secretariat in the state of Rio Grande do Sul in 1975 revealed that only 27 percent of ths state's firms with more than 30 women employees were fulfilling their legal obligations for provision of childcare arrangements (Campos, 1977: 5). A similar study in the state of São Paulo by the state Social Welfare Secretariat found only 260 centers available, or one opening for every 28 children of working mothers (Nos Mulheres 2: 1976:10).

personnel managers interviewed in 20 São Paulo firms in 1965, from a variety of sectors and accounting for 12,467 female employees, 13 affirmed their policy of firing women at these times, primarily in order to avoid the installation of daycare centers (Cardone 1975:130).

There are some private daycare centers, but they are expensive and are therefore accessible only to middle- and upper-class families. The majority of working mothers must find individual solutions to their work-home responsibilities. A study of São Paulo working mothers in 1970 found that nearly half leave their children with relatives, 22 percent leave them unattended, and only 1 percent leave them in daycare centers. Of the working mothers who were manual laborers (83 percent), a full 30 percent left their children unattended while working (Secretaria do Trabalho e Administração, São Paulo, 1970: 31-36, cited in Campos, 1977:2).

Because most of the larger firms in the legalized formal sector specifically demand single women as laborers, married women must find work elsewhere. Indeed, women workers as a whole are extremely concentrated in the service sector, which accounted for 70 percent of the female labor force in 1970, compared with only 10 percent in manufacturing, and 20 percent in the primary sector; since 1940 the proportion of female workers in the service sector has increased from 43 percent to 70 percent, while proportions in the other two sectors have declined. Furthermore, within the service sector more than half of women workers are in personal services (38.9 percent), a proportion which has gradually increased since 1940 (Miranda, 1977: 265,269).

The 1970 census reported a total of 16,680,000 women employed as domestic workers. These women, along with many others employed in the "informal sector," are not covered by the Labor Law. Only in 1972 was legislation passed giving domestic servants the right to contribute to the Social Security Institute (INPS), which entitles them to medical and hospital care, retirement benefits, and recourse to the Industrial Disputes Courts (UNESCO 1977: 41).

Maids rarely can afford to allocate the necessary monthly payments for this purpose, however, and employers who will consent to signing their servant's papers are few because of the legal obligations it implies. As in most other parts of the developing world, domestic service occupations tend to receive salaries below the minimum wage, and are subject to other legal, social, and economic stresses: "There are no statutory restrictions on hours of work; the employee has no legal right to a weekly rest day, to sick leave or to annual leave. Employment is very precarious and in the larger urban centers the situation is aggravated by the mutual distrust that almost invariably prevails between employers and employees..." (UNESCO, 1977:3). Domestic servants in some cities have recently begun to organize in order to press for maximum working hours and minimum wages, but a bill which would grant them the right to unionization was recently tabled by the National Chamber of Deputies (UNESCO, 1977: 41).

Since women generally are not socialized to be workers outside the home, their access to and demand for vocational training is low. Those who have had either academic or technical education tend to

be concentrated in traditionally female fields such as home economics, secretarial work, and health and beauty care (UNESCO, 1977:11). The expanding sectors of the Brazilian economy in recent years, however, have been those relatively capital-intensive heavy-industry sectors which have been the focus of government planning and investment. This trend has created a demand for skilled workers, who are relatively scarce. Most of the women in the labor force are not skilled because they lack access to either formal or on-the-job training. Therefore it is the relatively skilled male workers who benefit from jobs in the expanding industrial sectors. "As a result, increasing numbers of poorly trained women are being employed in sectors hitherto traditionall occupied by men," and are becoming, for example, street cleaners and bricklayers' assistants (UNESCO 1977:3).[3]

Women workers have often been described as a more docile labor force whose socialization is primarily oriented toward family roles; their professional identification is low, as is participation in labor movement activities (Saffioti 1976). Furthermore, female workers work for lower wages than men, even when educational level is controlled for (Ministerio do Trabalho:1976). Particularly for unpartnered women who head households, these market work conditions can aggravate a poverty situation.

[3]This has been the case of the textile industry in Minas Gerais since 1973. When men began to move into relatively higher-paying sectors, such as construction and railroad-building, the jobs they left were filled by women. By 1976, 80 percent of the textile workers were women. In that year, the Labor Minister responded to industrialists' demands to recommend the removal from the Labor Law of the clause which prohibits the use of female labor after 10:00 P.M., in order to allow women to fill previously male positions on the night shift as well (Estado de Minas, Jan. 29 and Feb. 8, 1976).

Evidence From Survey Data: Belo Horizonte

Detailed discussion of Belo Horizonte, the setting for the study, and the sample survey are found elswehere (Merrick, 1976; Sant'Anna, Merrick, and Mazumdar, 1976). The data consist of a representative sample of 2445 households in the Belo Horizonte metropolitan area in 1972. Care was taken to control for crowding or doubling up of households in the sample design; no more than one family unit per dwelling was included in the sample. In analyzing the data, households were stratified in four household income groups according to the level of household income per adult equivalent consumer. This measure attempts to treat household income on a per capita basis, while at the same time accounting for differences in consumption needs arising from household structure. The technique that was employed is described in Sant'Anna, Merrick, and Mazumdar.

Of the 2445 households in the single survey, 158 consisted of a single individual. To avoid distortion, the discussion is limited to the remaining 2287 households with two or more individuals. Table 3 presents a distribution of these households by sex and marital status of heads, and by the level of household income per equivalent consumer. Three household income classes are utilized; the poor, whose income per consumer averaged less than Cr$100 per month (in 1972, about U.S. $16--at the time a kilogram of rice cost about 30 cents and an inexpensive pair of shoes about $5), representing 29 percent of all households; low-income families, with income per consumer between Cr$100 and Cr$368, representing 46 percent; and middle/upper-income classes with C$369 or more, representing 25

Table 3. Distribution of Households in Belo Horizonte by Sex of Head and Household Income Level, 1972.

	Marital Status				
Sex-Income	Single	Married	Separated	Widowed	Total (%)
1. Male					
Poor	30	481	9	2	522 (27.4)
Low	86	801	16	4	907 (47.5)
M-H	54	438	7	0	479 (25.1)
Total	150	1720	32	6	1908 (100.0)
2. Female					
Poor	42	27	75	26	170 (44.9)
Low	52	25	65	8	150 (39.6)
M-H	24	8	18	9	59 (15.6)
Total	118	60	158	43	379 (100.0)

Note: Excludes one-person households

Source: PLAMBEL Survey Data (See Sant'Anna, Merrick, and Mazumdar 1976).

percent of households. The "poverty" cut-off was chosen in accord with the standard used by Brazilian authorities in determining a legal minimum salary based on consumption needs, but it should be noted that this cut-off was very low even by Brazilian standards, especially after the deterioration in the real value of the minimum wage resulting from restrictive wage policies described above.

Of the households shown in table 3, 379 (16.6 percent) were headed by women. This is somewhat higher than the proportion for urban Brazil as a whole, but less than the 18.8 percent that is the figure when individual households are included (a higher proportion of individual households are women). Households headed by women show a relatively higher incidence of poverty, with 41 percent of such households falling below the 100 Cruzeiro per person per month poverty line, compared to 27 percent for households headed by males. While one in every six households has a female head, they count for one in every four poverty households.

As the breakdown by marital status shows, these figures understate the poverty problem among households headed by women because the share of poor households headed by single women is lower (36 percent). For the 261 households headed by married, separated, and widowed women, the poverty group accounts for 49 percent, with the poverty share reaching 60 percent in the widow group (table 3).

Age is another important feature of the poverty observed among households headed by females. When single-person households are excluded, 80 percent of female household heads fall in the 25-59 age group. Of these, 47 percent are poor. When single heads of household are excluded,

the poverty share increases to 54 percent. This compares to only 27 percent for males.

The fact that the poverty share for households headed by females is higher still among the prime working age group is significant. This is the period in the life cycle in which the burden of household dependency and the vulnerability of the household to inadequacies in the earnings capacity of the head are likely to greatest. Clearly such households are particularly vulnerable when the head is a woman, and it is on the earning capacities of these households (e.g., age of head 25 to 59) that we focus subsequent analysis.

One reason for the increased incidence of poverty among households headed by women could be higher dependency--that is a higher ratio of nonworkers to workers than in male headed households. Table 4 shows that this is not the case. Dependency in poorer households is, in fact, higher among those headed by males, though not by much.

Despite the fact that increased dependency does not explain male-female differences, its role in poverty is clearly important. When we compare poor households to the income group above them, especially the adjacent low-income group, the differences are striking. Additional workers do make a difference in the comparative economic situation of the poor and low-income groups. One of the principal findings of the earlier analysis of these data mentioned above was that low-income households, while similar in many respects to the poor groups, were able to break through the poverty threshold because of the added earnings of a secondary worker.

The importance of income other than the head's salary is shown

Table 4. Dependency Ratios (Non-workers/Workers) by Sex of Head and Marital Status.

	Single	Married	Separated & Widowed
1. Male			
Poor	2.6	4.0	3.6
Low	1.2	2.2	1.7
M-H	0.7	1.7	0.6
2. Female			
Poor	2.3	3.8	2.6
Low	0.9	1.3	1.5
M-H	1.0	1.0	1.3

in table 5, which breaks down household income by three sources: head's salary, other salaries, and nonsalary income (pensions, rental income, other transfers). The distributions are cross-tabulated by household income level and by the sex and marital status of heads. Several differences stand out. Except for single persons, the earnings of female heads constitute a much lower share of household income than those of male heads. This suggests that other income sources (salaries of other workers and nonsalary income) are important in household income differences. Indeed, the share of these other sources is higher in the low-income category for female heads than for the poor group. The same is true for males, but less significant because of the lower weight of income from other sources vis-à-vis the head's salary.

Nonsalary income is more important for the separated-widowed marital status group. It is four percentage points higher in the low-income category than in the poor group, but does not appear to play a major role in other differentials. The survey data report income from other sources, but do not provide enough information to determine the reasons for differences other than obvious ones - - age, marital status, and income level. For this reason, we concentrate our attention on the work and earnings status of household members.

Table 6 presents a descriptive breakdown of economic activities of adult members of households headed by women. (Table 7 shows comparable data for households headed by men.) The tables appear complicated, but they are not. For each marital status and household income category (the columns of the table) an inventory of the potential earners in the households in each group is shown, starting with heads and followed by other adult males and other adult females in the

Table 5. Sources of Household Income by Sex of Head, Household Income Level and Marital Status.

	Single		Married		Widow-Sep	
	male	female	male	female	male	female
1. Poor						
Head's Salary	59.1	74.5	71.4	43.0	56.8	32.8
Other Salary	19.1	8.7	14.9	23.0	11.4	30.1
Non-Salary	21.8	16.8	13.7	34.0	31.8	37.1
(N)	(10)	(26)	(414)	(25)	(9)	(89)
2. Low						
Head's Salary	51.2	43.0	68.6	40.8	41.4	25.5
Other Salary	37.5	47.0	22.4	40.8	39.8	33.1
Non-Salary	11.3	10.0	9.0	18.4	18.8	41.4
(N)	(30)	(39)	(690)	(23)	(12)	(53)
3. Middle-High						
Head's Salary	45.1	47.4	70.6	31.0	40.3	37.5
Other Salary	33.1	33.0	21.7	28.8	27.2	30.5
Non-Salary	21.8	19.6	7.7	40.2	32.5	32.0
(N)	(24)	(22)	(379)	(7)	(4)	(16)

Source: Survey Data.

Table 6. Data on Employment in Households Headed by Females Aged 25 to 59 years by Marital Status and Income Group.

	Poor			Low			Middle-High		
	single	married	widowed-separated	single	married	widowed-separated	single	married	widowed-separated
1. Number of Households (N)	26	25	89	39	23	53	22	7	16
2. Working Heads (Percent)	84.6	84.0	69.7	94.9	73.9	60.4	86.4	71.4	68.8
3. Informal Employment (Percent of Workers)	77.3	85.7	85.5	18.9	35.3	50.0	0.0	*	9.1
4. Adult Males (N)	11	87	83	34	34	46	8	8	16
5. Working (Percent)	18.2	29.9	32.5	64.7	61.8	56.5	12.5	37.5	37.5
6. Informal Employment (Percent of Workers)	*	50.0	74.1	13.6	28.6	15.4	*	*	0.0
7. Other Adult Females (N)	18	74	121	76	27	65	33	3	16
8. Working (Percent)	27.7	5.4	33.9	44.7	51.9	35.4	27.3	*	37.5
9. Informal Employment (Percent of Workers)	*	50.0	92.7	20.5	28.6	52.2	0.0	*	16.7

Source: Survey Data
Note: * indicates that there were 5 or fewer cases in denominator of ratio.

Table 7. Data on Employment in Households Headed by Males Aged 25 to 59 years by Marital Status and Income Group.

	Poor			Low			Middle-High		
	single	married	widowed-separated	single	married	widowed separated	single	married	widowed-separated
1. Number of Households (N)	10	414	9	36	690	12	24	379	4
2. Working Heads (Percent)	80.0	82.1	66.7	94.4	91.7	75.0	91.7	96.3	*
3. Informal Employment (Percent of Workers)	25.0	23.2	33.0	26.5	10.7	22.2	0.0	2.7	*
4. Adult Males (N)	9	278	7	33	327	21	19	128	9
5. Working (Percent)	0.0	27.3	0.0	57.6	51.1	61.9	68.4	40.6	55.5
6. Informal Employment (Percent of Workers)	*	48.7	*	15.8	35.3	46.2	23.0	13.5	*
7. Other Adult Females (N)	20	826	13	65	1270	15	44	597	0
8. Working (Percent)	15.0	10.7	15.4	26.7	19.7	26.7	34.1	32.8	*
9. Informal Employment (Percent of Workers)	*	90.9	*	52.9	51.6	*	13.3	16.8	*

Source: Survey Data

Note: * indicates that there were 5 or fewer cases in denominator of ratio.

household. The percentage actually working is shown for each, and of those working, the percentage employed in the so-called informal sector.

An explanatory note on the latter is required. Belo Horizonte's labor market, like those of other large cities in Brazil, is highly segmented. Owing to the wage policy and technology employed in recent industrialization, the number of jobs available in more highly capitalized establishments is limited. Such jobs require higher skills, but pay more and offer a greater degree of employment and income security, including protection under Brazilian labor law. Though it is difficult and misleading to group all workers into "formal" and "informal" categories, the concept is useful in understanding differences in employment and earnings opportunities at various levels in Brazil's urban labor market. A more detailed discussion of the informal sector in Belo Horizonte and its relation to wage and investment policy is found elsewhere (Merrick, 1976). The criterion for distinguishing formal and informal employment here is payment of social security taxes, which are shared by employer and employee, and which were shown in the study just mentioned to be the best screening measure for identifying the self-employment or loose employment arrangements, lack of minimum wage protection, and other features of informal employment.

Informal employment plays a major role in labor absorption in Belo Horizonte. While informal employment is more abundant, and often preferred by employers interested in keeping labor costs down, workers who get informal jobs have limited bargaining power and job protection, so that wages are low and labor turnover high. Domestic

service is by far the most important form of informal activity for females in Belo Horizonte, which is typical of many Latin American cities in this respect (Jelin, 1976). Nearly all (86 percent) married, widowed or separated heads of poor households were employed in informal activities. For male heads, the figure is around 25 percent. The only other groups that come near to this are single heads of poor families and the widowed/separated category. Informal employment is also important for other workers in poor households, though their limited number makes comparison difficult.

The availability of secondary workers, as well as the sex of such workers, is a major point of contrast between poor and low-income households. Females tend to outnumber males in most households headed by women, but in low-income households the proportion of the males who work is about double (60 percent) that of poor households (30 percent), suggesting that male secondary workers make an important difference in the income status of these households. The differences for other females are not as large. They may also be less important, since the other males who work in the low-income class are also more likely to secure formal sector jobs with higher and more steady income for these households.

These differences between work patterns in poor and low-income households headed by women are similar in most respects to differences reported for the entire sample in the Belo Horizonte survey, except that they are more accentuated. One important difference is that a higher proportion of female heads in poor households work than in other income classes, whereas the reverse is true for male heads. This

means that the type of job found and the earnings generated by it are even more important for households headed by females (Wolfe, 1975). Another is that comparatively few male secondary workers are found in poor households headed by females, so these households are more dependent on earnings of females. Two analytical questions are thus raised: 1) Why do so few other adults, particularly males, contribute to household income in poor households headed by females? 2) Why do so few other adults, particularly males, contribute to household income in poor households headed by females?

Since poor households headed by women depend much more than households headed by males on the earnings of the head, the head's earnings capacity is a key variable in the economic status of the households. Comparative analysis of the earnings of male and female household heads shows that while human capital variables (age and education) are important determinants of the general level of earnings, labor-market structure (principally the jobs open to women) accounts for most of the differential earnings between males and females.

Table 8 presents a comparative analysis of the earnings of prime age male and female heads of household in the Belo Horizonte survey. Separate multiple regression results for the logs of earnings are shown, along with percentage of the population in each category of the variables included in the analysis. The independent variables in the regression are dummy variables, which take the value of one when the person belongs to the category and are zero otherwise. Regression coefficients represent deviations of the log of earnings from the mean value indicated by the constant term (workers aged 25 to 39 years with completed primary

Table 8 Comparison of Multiple Regression Analysis Logs of Earnings of Prime Age Male and Female Heads of Household.

Variables	Males		Females	
	Regression Coefficient (t test)	Percent of Population in Category	Regression Coefficient (t test)	Percent of Population in Category
Age 40+	.160 (4.2)	47.0	.149 (1.2)	50.4
Education, Less than Completed Primary	-.586 (13.7)	38.4	-.460 (3.2)	44.7
Education, Completed Secondary and above	1.061 (20.1)	18.5	.587 (3.3)	17.7
Informal Sector Employment	-.462 (7.9)	12.5	-.993 (6.8)	53.1
Small Children In Household	.113 (2.3)	82.2	.166 (1.3)	53.5
Constant (Ages 25-39, Completed Primary Education, Formal Sector. No Small Children)	6.42		5.87	
R^2	.44		.43	
F Test	220.0		35.2	
N	1420		226	

education, having no small children of less than six years old in the household, and holding a formal sector job).

A major sex differential appears even in this mean value, which is 6.24 (Cr$614) for males and 5.87 (Cr$354) for females. Male and female heads do not differ markedly in either their age or educational characteristics. In both about 50 percent are over 40, and about 60 percent have less than a primary education. Small children in the household, which might restrict the activities of female heads, do not appear to have a significant effect--in fact their influence is closer to being significant for males, and the effect on earnings is positive.

The most striking differential is in type of employment, as indicated by the proportion of workers whose jobs are in the informal sector, 53.1 percent of the females have jobs in the informal sector, compared to 12.5 percent of the males. Further, the differential in informal earnings for female heads of household is greater in reference both to formal sector jobs and to males in the informal sector. Interpretation of the regression gives the averages shown in table 9.

Table 9. Male/Female Differentials in Average Monthly Earnings in Cruzeiros, 1972.

	Male	Female	Male/Female
Formal Sector	614	354	1.7
Informal Sector	387	131	3.0
Formal/Informal	1.6	2.7	- -

Clearly a major part of the disadvantaged earnings position of working female heads of household derives from a comparative lack of access to formal sector jobs and their benefits in the urban labor market. Admittedly it is difficult analytically to isolate effects of informal employment from age and educational characteristics, which themselves correlate highly with informal employment (Merrick, 1976), but the male-female differential appears to be less affected by this interaction. The advantage and disadvantages of high and low educational attainment have a marked effect on male earnings differentials, whereas simply being a female increases the likelihood of being in the informal sector.

Work Status of Other Adult Household Members

Another major issue concerns the work of household members other than the head. Household members' earnings generally follow the patterns described in the previous section, especially the sex differential, so that the role of other workers in household income is closely related to who works or does not work. Here we seek to determine the extent that household structure (e.g., composition by member age, sex, and marital status) and human capital endowments (especially education) interact in determining the work status of these other members. Work status is treated as a dichotomous variable, with all other adult household members classed either as working or not working. Besides the four variables just mentioned, the other explanatory variables include the sex of the head of household, the household's income level, and a variable combining the work and earnings of the head. The symbols for variables and their categories are shown in table 10.

Table 10. Analysis of Work Status of Adult Household Members Other than Head: Definitions and Descriptions of Variables.

Variable Number & Symbol	Variable Name	Number of Categories	Value of Categories & Symbols
1 WS	Work Status	2	Working/Not Working (W/
2 A	Age	3	15-24/25-59/60+
3 S	Sex	2	Female/Male (F/M)
4 E	Education	3	Incomplete Primary/ Complete Primary/ Complete Secondary (IP,
5 MS	Marital Status	2	Married/Single-Separated-Widowed* (M,I
6 SH	Sex of Household Head	2	Male/Female (M,F,)
7 WE	Work-Earnings Status of Head	4	Not Working/Working LT One Minimum Salary/Worki 1 - 3 MS/Working GE 4 MS (W1, W2, W3, W4)
8 Y	Income Level of Household	3	Poor/Low/Middle-High (P/
Total Cells		1728	
Total Number of Individuals		3011	

*NM category includes all unpartnered women.

Hierarchical log-linear models are used to analyze interrelations between the variables and their effects on work status. Log-linear models are similar in many respects to multiple regression with dummy variables, but have several advantages over multiple regression when the dependent variable is also dichotomous. Coefficients estimated by ordinary least squares will "predict" values of less than zero or greater than one when the expected proportions deviate substantially from .5, as is the case here. They also assume that the effects of variables are additive, which is unlikely when interactions are present. To cope with these problems there are now available a range of techniques, including log-linear models, which employ maximum likelihood estimation of the logarithms of cell frequencies of multidimensional tables (into which the original data are transformed) to determine interaction models and the effects implied in them. These effects relate to the amount of variation from the grand mean deriving from an individual's belonging to a particular category of a variable or to some combination of the categories of several variables. In relation to a dependent variable (e.g., work status), interaction effects can be compositional or direct, with compositional effects relating to the interaction of independent variables among themselves and to the composition of the sample population exhibiting such interactions.

A selection of the log-linear models tested is presented in the appendix. The specific sequence of models tested starts with three variables: (sex, sex of head, household income) and then moves on to the marginal effects of age, education, marital status, and work-earnings status of the head, and then to various sets of interactions among

the independent variables and to their joint effects on work status. The tests described in the appendix reveal that the interactive compositional effects of household structure variables accounts for most of the variation in work status of other adult members of female headed households. Table 11 summarizes these interactions. In Part A (the first three columns) compositional effects of sex, age, education, marital status, and head's work and earnings are summarized. In the two-way interactions, other females (S = F) are more likely to be in the 25-59 age category, in the two extreme educational groups, married, and in male-headed households. Other adults are likely to be older and unmarried when the household heads are female. Female heads are likely to be nonworking or earning less than the minimum wage if working. Other adults in households headed by women are more likely to be older or younger unmarried females (and not the prime age group most likely to work when single).

Part B of table 11 shows the direct effect of variables on work status. Items B1 and B5 give the direct effects on work status of the compositional variables in part A of the table. In comparison with compositional effects, the direct effects of these interactions are not as strong (when employing the standardized effects as the basis of comparison). The interaction of age and marital status is confirmed, as is the negative effect of being a married female. Tests of models which related sex of head to work status did not show an improvement over those which related sex of head to household composition (principally sex and age of other adults) which themselves did affect work status. The tests indicate that once account is taken of differ-

Table 11. Effect Parameters Pertaining to Household Composition (A) and Interaction between Explanatory Variables in Relation to Work Status.

A. Household Composition Effects	Effect	Standardized Effect	B. Direct Interaction Effect on Work Status	Effect	Stand Effe
1. S,A = F, 15-24	-.051	-1.16	1. WS,S,A = W,F,15-24	.006	.14
F, 25-59	.188	4.09	W,F,25-59	-.042	-.90
F, 60-64	-.137	-2.62	W,F,60 +	.035	.67
2. MS,A = M, 15-24	.539	12.23			
M, 25-59	-.371	-8.07	2. WS,MS,A = W,M, 15-24	.050	1.14
M,60 +	-.168	-3.24	W,M,25-59	-.152	-3.31
3. S,E = F,1P	.019	0.41	W,M, 60 +	.102	1.94
F,CP	-.059	-1.30			
F,CS	.078	1.54	3. WS,S,E = W,F,1P	.063	1.34
4. S,MS, = F,M	.140	4.95	W,F,CP	.031	0.69
			W,F,CS	-.093	-1.90
5. SH,MS = F,NM	.096	2.87			
			4. WS,S,MS = W,F,M	-.018	0.52
6. S,SH = M,F,	.166	4.95			
7. SH,A = F, 15-24	-.173	-3.92			
F, 25-59	-.158	-3.47	5. WS,MS,SH = W,NM,F	.081	2.41
F, 60 +	.332	6.35			
			6. WS,SH,WE = W,F,NW	.021	0.37
8. SH,WE = F,NW	.199	3.50	= W,F,W1	-.066	-1.10
F,W1	.288	4.81	= W,F,W2	.035	0.70
F,W2	-.306	-6.10	= W,F,W3	.010	0.15
F,W3	-.181	-2.78			
9. S,MS,A = F,NM, 15-24	.033	0.76	7. WS,S,A,MS = W,F,NM, 15-24	.053	1.21
F,NM, 25-59	-.238	-5.19	W,F,NM, 25-59	.030	0.64
F,NM,60+	.205	3.92	W,F,NM, 60+	-.083	1.59
10. S,SH,A = F,F, 15-24	.164	3.72			
F,F, 25-59	-.311	6.78	8. WS,SH,Y = W,F,D	-.058	-1.19
F,F, 60+	.147	2.82	W,F,L	-.069	-1.55
			W,F,MH	.126	2.53
11. SH,Y = F,P	.092	1.90			
F,L	-.087	-1.96			
F,M-H	-.005	-0.10			

ences in marital status of other household members (male households typically having a spouse who is less likely to work) the work potential of households headed by women is less because their other members, while more likely to be unmarried, are also likely to be younger or older than the prime age adults most likely to be secondary earners. The effects of age, sex, and marital status on work status are direct and interdependent, but the effect is conditional on sex of head. These household composition effects, in combination with the lower overall occurance of secondary workers in low-income households and the greater likelihood of female earnings being lower, complete the description of the economic bind in which these households find themselves, and explain why the likelihood is high that a household headed by a female will be poor.

Discussion

The data analyzed above provide added insight into particular causes of poverty among households headed by females in Brazil. Pressure on the real wages of poor families have led them to seek supplementary earnings of workers other than the household head. For poor households headed by women, the economic situation is more difficult and the option of relying on additional workers is less feasible. First, because they are females, heads of these households are more likely to be unemployed, or if employed to have occupations in the informal sector, with correspondingly lower wages than those for male heads of household. Second, other household members are more likely to be outside the prime

working age, and to be female rather than male; therefore, they face the same job and earnings constraints as the head of household. As a result, households headed by women have fewer secondary workers to help raise family income, and thus the major survival strategy utilized as a whole is less available to this subgroup.

The serious implications of these findings were more graphically described in the diary of Rio slum-dweller Maria Carolina de Jesus, which was published in 1962, and in the few studies which exist of households headed by females in Brazil and Latin America in general. Piho's (1975) study of female textile workers in Mexico revealed a pattern similar to the one described here: 76 percent of the workers she interviewed were women without male partners, and their insufficient wages forced them to engage in a variety of supplementary activities such as renting rooms, washing and ironing clothes, cleaning houses and selling sweets. For these women, "adopted relatives" and economically inactive relatives represented a real burden to the female worker; only 33 percent of workers' dependents were their own children while other dependents included grandchildren, nephews, nieces, mothers, and other relatives.

Unstable marital relationships are often associated with high unemployment rates for males, which create situations in which "the primary axis of kinship structure is the relationship between a mother and her children, her own or adoptive" (Peattie, 1970: 43), rather than that between spouses. In her study of households headed by females in the Dominican Republic, Brown argues that multiple serial mating patterns represent a coping strategy for women that affords them greater

reproductive success, shelter size and quality, quantity of food consumption, and psychological well-being, in comparison with the situation of women following the single-mate pattern, who were in a more favorable situation in terms of measures of traditional wealth--land, income, and capital (Brown, 1975a: 153-155). Households headed by females thus represent relatively successful coping strategies for the poor, who "need to develop more flexible networks in place of the nuclear family" (Brown, 1975b: 327). Because of the importance of female kinship ties in low-income populations, households headed by women are more likely to contain a higher proportion of female members overall than are households headed by males. Such strategies may be successful when female work groups constituted within the household are viable, as described by Kuznesof (1977) in colonial São Paulo, where such households were engaged in home-based cotton textile manufacture.

The findings of this study, however, have suggested that such a strategy is not always successful in coping with economic stress, given the kind of development policies currently being carried out in Brazil and many other countries, which place severe constraints on the employment and earnings possibilities for women. Aside from labor market limitations, social acceptance of women who head their households is probably largely dependent on the strength of patriarchal norms in the society. In Brazil, for example, and in Minas Gerais in particular, the patriarchal family is noted for its traditional form and strength

(Wagley, 1970). Furthermore, our findings demonstrate that households formed around a female head in Brazil tend to collect persons who are not working-age males and therefore are less likely to contribute to household income. There are a number of possible explanations for this pattern. Prevailing social norms may make the presence of adult males other than sons in such households subject to censure; furthermore adult males probably have more options and freedom of movement, so that they are less often "trapped" by poverty. In general, women's primary orientation to kinship and family roles makes them more liable to take on the support of a variety of relatives, and for female household heads with children, extra adult female members of the household may perform important domestic and childcare activities.

Women who head households in Latin America are anomalous, because their economic reality contrasts with widespread social norms.

> The ideology of the nuclear family as the universal mode of sexual reproduction and socialization of offspring . . . and of the nuclear, patriarchal, male-dominated form as the norm in Latin America persist, despite the rising frequency of female-headed households. When they do occur, they are characterized as matrifocal or even matriarchal, a distortion of the role of women in such circumstances, who bear the economic and social burdens of the reproductive nuclei with none of the rewards of social esteem and economic support given to the males who undertake such responsibilities (Nash, 1976: 12).

Because women are socialized primarily for family roles and not for an econmmically active life, they lack a primary identification with their work roles as well as the training required to achieve comfortable and challenging jobs. Furthermore, women who head households without a male partner face a double exploitation,"first as a worker and second as a woman who has to fulfill family obligations (Piho, 1975: 241). In the absence of adequate childcare facilities, female occupational activities create serious problems of abandonment of children, and of role conflict for the mother.

What are the implications of these patterns for the prospects of women's future participation in the economic development of their nation? The highly technology-oriented model of industrialization which is increasingly widespread in developing countries carries with it some seemingly built-in biases against women. Technological change in general often functions to replace women with men in the labor market (Chaney and Schmink, 1976). In part this is because women's access to technical training is extremely limited. Even when young women choose technical courses, however, they are often frustrated in their attempts to obtain employment, either through outright discrimination against women in technical occupations, or through traditional restrictions on women which limit their mobility and flexibility.[4]

In order to foster greater income-generating capacity among households headed by females and other poor households, development planners would be advised to emphasize the <u>substitutability</u> of labor of different ages and sexes in both home and production spheres. Policies aimed at raising the productivity of poor households should recognize the importance of activities in <u>both</u> spheres but should also be <u>neutral</u> in their demand for labor, so as not to simply perpetuate the existing division of labor. New technology in home production activities, for example, might allow children to substitute for adults

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[4] For instance, several young women in Belo Horizonte who were interviewed by one of the authors could not use their technical degrees, because the only employers who would accept women were in small towns outside the capital; the jobs were unacceptable to the women's families because it implied their setting up independent households.

when necessary.

While young women may find employment in commerce and service activities and even in some industries, older and married women face an increasingly limited array of job options, and are very unlikely to have any sort of occupational training beyond their traditional female domestic activities. These constraints, combined with the absence of childcare facilities, place the majority of older women in activities in the informal sector, where wages are low, stability is almost nonexistent, and the isolated work situation eliminates them from the organized labor movement. For younger women an increased availability of technical training is the most important mechanism for equipping them for the current job market. The provision of adequate childcare facilities would allow older women more occupational options, while simultaneously providing a more secure environment for the children of these mothers.

Appendix. Log Linear Analysis of Work Status

Log linear analysis is known well enough to make detailed discussion here unnecessary (Reynolds 1977; Bishop, Feinberg and Holland 1975; Soldo 1977). It will be useful to illustrate briefly how it can be employed with our data. Table I presents a frequency distribution of work status of other adults by their sex, the sex of household head, and household income level. The symbols for variables and their categories shown in Table 10. The objective of a log-linear analysis is to account for the distribution of individuals across the tables three dimension. Unlike a regression equation, which provides an estimate for a dependent variable, the log-linear equation predicts cell frequencies. The observed cell frequencies can be expressed as the product of all the main effects and interaction effects. For example in table I, work status, WS_i (i=1,2), is distributed by sex, S (j=1,2), sex of head SH_k (k=1,2), and income level, Y (1-1,3). Any frequency, f_{ijkl}, can be completely accounted for by specifying a saturated model including all possible main and interaction effects:

$$(1)\quad f_{ijkl} = \eta \gamma^{WS} \gamma^{S} \gamma^{SH} \gamma^{Y} \gamma^{WS,S} \gamma^{WS,SH}$$

$$\gamma^{WS,Y} \gamma^{S,SH} \gamma^{S,Y} \gamma^{SH,Y}$$

$$\gamma^{WS,S,SH} \gamma^{WS,S,Y} \gamma^{WS,SH,Y}$$

$$\gamma^{WS,S,SH,Y}$$

where η is a proportional constant term to insure that cell frequencies

to the number of observations in the table. The parameter S pertains to the main effect for sex, and WS,S is introduced as a parameter pertaining to the specific effect of sex on work status. Taking the logs of both sides of equation (1) transforms it into an additive analysis of variance type model:

$$(2)\ \log f_{ijkl} = (GM) + (WS)_i + (S)_j + (SH)_k + \ldots + (S,SH)_{jk} + \ldots + (WS,S,SHY)_{kjke}$$

where (GM) is the grand mean of the logs of cell frequencies and $(WS)_i$ are the main effects of work status, $(WS,S)_{ij}$ the interaction of work status and sex, and so on. To test a specific hypothesis, the variables whose effects are being tested are included in the equation, with the remaining parameters set equal to one.

The logs of cell frequencies and their means are shown in table I. To compute the main effects (expected cell frequencies) for the two categories of work status, we subtract the grand mean from the cell means (e.g., WS = W: 3.90 - 4.24 = -.34), as shown in table II. To compute the effect of sex on work status when sex = F, we compute their combined mean and subtract the sum of the deviations from the grand mean (4.17 - (4.24 + (3.90 - 4.24) + (4.67 - 4.24)) = .16 as shown in the two-way interactions of table II.

All of the possible interactions in the four-variable model shown in table I are given in table II, which represents the saturated model. In testing hypotheses, the objective is to account for cell frequencies with as few interactions as needed. This is especially important when we include all of the variables in table 10, not just the four shown in tables I and II. To accomplish this, maximum likelihood estimates of

SEX HEAD SEX WORK STATUS	Household Income Level POOR n	 log	 LOW n	 log	 MIDDLE-HIGH n	 log	Work Status Means
MALE HEAD							
FEMALE							
Working	58	4.06	174	5.16	271	5.60	4.93
Not Working	472	6.26	709	6.56	309	5.73	6.15
Income Level Mean		5.11		5.86		5.67	5.54
MALE							
Working	47	3.85	127	4.84	50	3.91	4.20
Not Working	135	4.91	116	4.75	59	4.08	4.58
Income Level Mean		4.38		4.80		4.00	4.39
FEMALE HEAD							
FEMALE							
Working	30	3.40	44	3.78	21	3.04	3.41
Not Working	97	4.57	77	4.34	35	3.56	4.16
Income Level Mean		3.99		4.06		3.30	3.79
MALE							
Working	25	3.22	45	3.81	8	2.08	3.04
Not Working	55	4.01	30	3.40	17	2.83	3.41
Income Level Mean		3.62		3.61		2.46	3.23

Summary:	Grand Mean	Sex of Head	Sex	Income Level	Work Status
	4.24	F=4.97	F=4.67	P=4.28	W=3.90
		M=3.51	M=3.81	L=4.58	NW=4.58
				M-H=3.86	

expected cell frequencies are compared to the observed by means of the chi-square likelihood ratio goodness of fit statistic (X^2_{LR}). In testing hypotheses regarding the effect of household structure and human capital variables on work status, log-linear models incorporating increasingly complex sets of effects,and interactions are evaluated sequentially using X^2_{LR} until a model is identified in which no further significant improvements in X^2_{LR} can be made. (Note: X^2_{LR} is 0 in the fully saturated model, but all degrees of freedom are used up.) The effect parameters for this model are then examined in a manner similar to regression coefficients.

Table III presents the stepwise sequence of models tested in our analysis of the work status of other adult household members. Each step is denoted by a panel heading. The first column in each panel describes the model being tested using standard notation. Only parameters indicated for the specific model are included, with the remainder set equal to 1, or having no effect. The second column shows the goodness of fit statistic, $X^2_{LR,}$ and the third column the degrees of freedom available in each specific test. In a smaller table, the significance level of X^2_{LR} indicates goodness of fit, but with large samples it is inefficient. An alternative, the index of dissimilarity (Δ, the percentage of cases which are misclassified under the hypothesis being tested) is given in column four.

Panel A tests the model (A2) incorporating only two-way interactions of sex, sex of head, and household income level (from table I) on work status. In comparison with the null hypothesis (A1, no significant effects), A2 improves X^2 by 233.58, or 58.4 per degree of freedom, which is a significant reduction (for significance test statistics, see Joreskog and Sorbom 1976). In Panel B, age, education, marital status, and head's work-

Table II. Effect Parameters Pertaining to Table I, Work Status of Other Adults by Sex, Sex of Head and Household Income Level

Effects	Additive Model	Multiplicative Model*
Grand Mean	4.24	69.41
Main Effects**		
WS = W	-.34	.71
WS = NW	.34	1.40
S = M	-.43	.65
S = F	.43	1.54
SH = M	.73	2.08
SH = F	-.73	.48
Y = P	.04	1.04
Y = L	.34	1.40
Y = M-H	-.38	.68
Two-Way Interactions		
WS,S = W,F	-.16	.85
WS,S = W,M	.16	1.17
WS,SH = W,F	.06	1.06
WS,SH = W,M	-.06	.94
WS,Y = W,D	-.30	.74
WS,Y = W,L	.16	1.17
WS,Y = W,M-H	.14	1.15
S,SH = F,F	-.15	.86
S,SH = F,M	.15	1.16
SH,Y = F,P	.26	1.30
SH,Y = F,L	-.02	.98
SH,Y = F,M-H	-.24	.79
Three-Way Interactions		
WS,S,SH = W,F,M	-.06	.94
WS,S,SH = W,F,F	.06	1.06
WS,S,Y = W,F,P	-.03	.97
WS,S,Y = W,F,L	-.16	.85
WS,S,Y = W,F,MH	.19	1.21
S,SH,Y = F,M,P	-.06	.94
S,SH,Y = F,M,L	.00	1.00
S,SH,Y = F,M,M-H	.06	1.06
Four-Way Interactions		
WS,S,SH,Y = W,F,M,P	-.02	.98
WS,S,SH,Y = W,F,M,L	-.01	1.01
WS,S,SH,Y = W,F,M,M-H	.03	1.03

* Multiplicative model values are antilogs of additive model values. Note that grand mean of multiplicative model is a geometric rather than arithmetic mean.

** Symbol and variable definitions are given on p 29 Table 10.

Table III. Selected Log-Linear Models of the Relation Between Work-Status of Other Adults and Household Structure Variables

Hypotheses	X^2_{LR}	DF	Δ
A. Marginals for Work Status, Sex, Sex of Head, and Income with Added Variables: Age, Education, Marital Status, Work-Earnings of Head			
1. WS S SH Y A E MS WE	5481.85	1714	47.0
2. WS,S WS,SH WS,Y A E MS WE	5248.27	1710	46.1
3. A1 - A2	233.58	4	
B. Marginal Effects of Age, Education, Marital Status, & Head's Work-Earnings on Work Status			
1. A2 + WS,A	5241.05	1708	46.1
2. A2 - B1	7.22	2	
3. A2 + WS,E	5233.88	1708	46.1
4. A2 - B3	14.39	2	
5. A2 + WS,MS	5180.47	1709	46.0
6. A2 - B5	67.8	1	
7. A2 + WS,WE	5200.07	1707	46.1
8. A2 - B7	48.2	3	
9. A2 + WS,A + WS,E + WS,MS + WS,WE	5110.66	1702	45.9
C. Compositional Effects: Interrelations between Sex and Sex of Head, Sex of Head and Marital Status, Head's Work Status and Household Income			
1. B9 + WE,Y	3885.53	1696	41.2
2. B9 - C1	1314.54	6	
3. B9 + S,MS	4872.81	1701	45.2
4. B9 - C3	327.26	1	
5. B9 + MS,SH	5011.66	1701	45.6
6. B9 - C5	188.41	1	
7. B9 + WE,Y + S,MS + MS,SH	3548.71	1694	39.6
D. Interactive Effects of Sex, Marital Status, Sex of Head			
1. C7 + WS,S,MS	3533.71	1693	39.5
2. C7 - D1	15.00	1	
3. C7 + WS,MS,SH	3520.96	1693	39.4
4. C7 - D3	27.75	1	
5. C7 + WS,S,MS + WS,MS,SH	3506.15	1692	39.3
E. Interactive Effects of Age with Sex, Marital Status			
1. D5 + WS,A,S	3212.91	1688	37.4
2. D5 - E1	293.24	4	
3. D5 + WS,A,MS	2447.48	1688	30.6
4. D5 - E3	1058.67	4	
5. D5 + WS,A,S + WS,A,MS	2329.82	1684	29.5
6. D5 - E5	1176.33	8	
7. D5 + WS,A,S,MS	2252.62	1680	29.1

Table III. (Continued)

Hypotheses	X^2_{LR}	DF	Δ
F. Interaction of Head's Sex, Work-Earnings, and Household Income			
1. E7 + SH,WE	1974.28	1677	26.7
2. E7 - F1	278.34	3	
3. E7 + SH,Y	2213.90	1678	28.8
4. E7 - F3	38.73	2	
5. E7 + SH,WE + SH,Y	1971.66	1675	26.7
6. E7 - F5	280.96	5	
7. E7 + SH,WE + WS,WE,Y	1928.86	1671	26.3
8. E7 - F7	323.76	9	
9. F7 + WS,S,E	1896.78	1664	26.1
10. E9 - F9	355.84	16	
11. F10 + WS,SH,WE,Y	1758.50	1648	25.2
	494.12	32	
G. Interaction of Age, Sex of Head, Household Income			
1. F10 + A,Y	1734.17	1644	25.1
2. F10 - G1	24.33	4	
3. F10 + S,Y	1728.47	1648	24.9
4. F10 - G3	30.17	2	
5. F10 + A,S,Y	1708.83	1638	24.7
6. F10 - G5	49.67	10	
7. F10 + A,SH	1637.15	1646	24.3
8. F10 - G7	121.35	2	
9. F10 + S,SH	1708.55	1647	25.0
10. F10 - G7	49.95	1	
11. F10 + A,S,SH	1496.03	1643	23.3
12. F10 - G11	262.47	5	

earnings are significant, but age and education are only marginal. However further tests revealed that their effects on work status are primarily joint effects in combination with other variables.

Underlying these bivariate relations between work status and the independent variables are a number of important relations between the independent variables themselves. As seen in Panel C, the work-earnings status of heads and household income level are closely related, as are sex and marital status, and marital status and the sex of head (e.g., the proportion of married females is likely to be higher in male headed households). Model C7 incorporates these interactions and yields a considerable improvement (a 1562 reduction in X^2_{LR} for 8 df).

Panel D explores the interaction effects of sex and marital status (S, MS), sex and sex of head (S, SH) and their effect on work status; both three-way interactions yield significant improvement. Panel E explores further three-way interactions of age, sex, and marital status, and shows that while age, by itself, does not have major effects on work status, age-sex and age-marital status composition of households have an important influence on work status of other household members (X^2_{LR} reduced by 1253.53 for 12 df).

Panel F takes up the strong relation between head's income, earnings, and household income found in model C1 and explores its relation to the head's sex (F1 and F3) and their combined effect on work status (F7). Both of the hypothesized two-way relationsare supported, but only WS, WE, Y brought a sizeable reduction in chi-square. Finally, F9 explores the interaction of education with sex,and F11 tests the further interaction of head's sex with WS, WE, Y in F7. Both bring further reductions in chi-

square but require a considerable reduction in the degrees of freedom to do so.

The last panel (G) in table III takes up the relation between household composition and the sex and income level of the household head. Previous models have shown that age and sex have an important effect on work status. To what extent is the potential for additional workers in households headed by females (and specifically poor households headed by females) affected by age-sex composition? Models G1 to G5 explore the relation of age and sex to household income, and G7 to G11 the relation with sex of head. Comparing the compositional effects associated with income level to those with sex of head, the latter are clearly the stronger (reducing X^2_{LR} by an average of 50 per degree of freedom compared to 5 per degree of freedom with the age, sex, income interaction). Model G11 has improved the "fit" of the original model by reducing the index of dissimilarity from 47 percent to 23 percent. Further tests yielded no significant improvement, and this model will be employed in studying the effect parameters of particular categories of the variables.

Table IV presents the effect parameters of variables and their interactions on work status from model G11. Although this model is less complex than the fully saturated model (preserving 1643 of the original 1728 degrees of freedom), it still involves a large number of higher order terms, and only a sample of them can be shown in the table. What then does the model tell us about the relation of work status of other household members to household structure? The margin of table IV lists variables and categories for which effects are being reported. For dichotomous variables WS, S, MS SH, the effect is shown only for one category, since

Table IV. Marginal Frequencies and Direct Effect Parameters of Models in Table 13.

	Marginal Frequency		Association With Work Status Assuming			
			A No Interaction (B9)		B Interactions (F11)	
	Effect (a)	Standardized Effect (b)	Effect (c)	Standardized Effect (d)	Effect (e)	Standardize Effect (f)
WS = W	-.113	-3.36	--	--	--	--
A = 15 - 24	.450	10.20	.007	0.19	-.069	-1.56
= 25 - 59	.136	2.96	-.069	-1.89	.098	2.13
= 60 +	-.586	-11.22	.062	1.21	-.029	-0.56
S = F	.306	9.09	-.166	-5.64	-.153	-4.56
E = IP	.020	0.25	.058	1.41	.031	0.65
= CP	.206	4.58	.037	0.93	.016	0.36
= CS	-.218	4.30	-.095	-2.20	-.047	-0.92
MS = NM	.264	7.84	.142	4.82	.031	0.93
SH = M	.245	7.29	-.114	-3.88	-.072	-2.16
WE = NW	-.115	-2.02	.024	0.43	-.007	-0.13
= W1	-.083	-1.39	-.007	-0.12	.015	0.25
= W2	.460	9.18	-.156	-3.66	-.096	-1.92
= W3	-.263	-4.05	.138	2.78	.088	1.36
Y = P	-.029	-.06	-.224	-5.21	-.153	-3.16
= L	.233	5.26	-.030	0.77	.007	0.14
= M-H	-.204	-4.10	.254	5.95	.146	2.93

the effect parameters are symmetric (e.g., WS, S for W, F = -.166 and for W, M = .166) in the additive logarithmic form. The multiplicative effects (antilogs of the additive) are multiplied by rather than added to the grand mean. As in the case of conventional regression coefficients, the effect parameters indicate the effect of being in a specific category of a specific variable or set of variables as a deviation from the mean when the variable is included. The first two columns (a,b) report marginals of all variables (the logs and their standardized values), e.g., the expected marginal frequencies in the contingency table implied by model G11. The remaining columns (c to f) show the association between work status and the independent variables. The magnitude and direction of this association or "effect" depends upon the model under which it is estimated. The second pair of columns (c,d) shows bivariate relations to work status when no interactions are assumed (as in model B9), while the third (e,f) assumes that the interactions of model G11 are present.

Comparing the results with and without interaction, we see that the effect of age shifts from negative to positive for the prime age category (ages 25-59), principally because of the interaction of sex and marital status, since married females in this category are less likely to be working than the unmarried males. Females are less likely to be working than males. The less educated are more likely to work than the more educated, though the education effect is less when interactions are taken into account. Similarly, unmarried individuals appear more likely to work without interactions but not so when interactions are included. A complex set of interactions affects the relation between work status of adults other than the head and the head and the work and earnings status of the

head, especially in the higher income categories for the head. This is further related to household income level, since there is a strong positive association between work/earning status and household income.

In comparing these results to what is typically found in the human capital literature on labor force participation, it should be recalled that these data embrace a much wider range of variation than is usual in that literature, which is usually focused on married women with husbands present. Restricting ourselves to that more limited subset of the data would yield results with positive effects on work status for education and heads' earnings, but prevent us from looking at the larger question of how household structure affects the operation of these variables in households which do not conform to this norm, in this case, female headed households. Controlling for household structure (by way of interactions between sex, sex of head, head's income, and household income) does yield the expected pattern of participation by secondary workers, whose role in supplementing the income of male-headed households in which the primary earner's wages are low is of recognized importance.

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Households Headed by Women in Third World Countries: An Overview

Mayra Buvinić & Nadia Youssef
International Center for Research on Women

Our ignorance of women's economic behavior within poor households is not confined to those living in households that shelter "intact" families. It extends to women who function as the de facto heads of perhaps the poorest households in the world today--that is, women who, because of marital dissolution, desertion, abandonment, absence of spouse, or the inability of the spouse to provide for the household, are placed in a situation where they become economically responsible for their own and their children's survival. These households are neither few nor restricted to a particular region, culture, or ethnic or socioeconomic group. It is estimated that between 25 and 33 per cent of all households in the world are de facto headed by women (Tinker, 1976: p. 37; Newland, n.d.; Germain, 1976-77) and that a major portion of poor families in all countries inhabit these households.

This overview attempts preliminary assessments of the magnitude and seriousness of this phenomenon in Third World countries. It also highlights some methodological obstacles to obtaining reliable information on these women. The crudeness of the estimates and the gaps in information should motivate concerted research efforts. The estimates themselves, however imprecise, should also trigger rapid action in terms of policy and programs for these women and their families.

Defining the Problem

Who are They?

Households headed by females cover a broad range of domestic situations. Typically, such households are characterized by the absence of a resident male head. Visible examples are households of widowed and divorced mothers; less obvious and more difficult to detect are those of separated, abandoned, and single mothers, and those where men are drawn away as migrant labor for considerable periods of time. Female-headed households also exist where a resident male head of household is unable to function as the economic provider and consequently loses his status in the home. Whenever factors such as low wages, unemployment, and limited access to jobs prevail in settings where the man is dependent largely on his economic role to maintain his position in the household, male marginality is created and matrifocal families are likely to develop.

The extent to which women in any of these situations become de facto heads of household (that is, they come to assume functions of economic responsibility for themselves and their children) will depend on a combination of two factors: 1) the specific position accorded to them by family and society, and 2) the ability or willingness of the kin unit or society at large to acknowledge financial responsibility to its female members. In many societies families are supposed to assume responsibility for some of these women (widows, for instance), but economic pressures prevent families from "actualizing" these duties. In such cases women become de facto heads of household.

What is Their Situation?

Poverty appears to be more prevalent among families with female headship. In Santiago, Chile, a 1970 study revealed that the median monthly incomes among poor households with female heads were consistently lower than among other types of households (Elizaga, 1970). A more recent field inquiry carried out in marginal zones of the same city showed that 10 percent of the male family heads and 29 percent of the female fell into the lowest income bracket (CEPAL, 1973). In Guayaquil, Ecuador, a similar survey indicated that 17 percent of the male and 37.5 percent of the female family heads fell into this lowest income category (JNPCE, 1973). A representative sample survey in metropolitan Belo Horizonte, Brazil, revealed that one household in five was headed by a woman. The percentage of women-headed households at poverty level was 41 percent, as compared to households headed by men in which poverty levels were found in only 26 percent of the cases. Moreover, when households headed by prime-age divorced and separated women were singled out, the proportion at poverty levels reached 60 percent (Merrick, 1977).

Women who are family heads work much more frequently than women in general. In the Caribbean, metropolitan Brazil, and Caracas, four female family heads in every 10 were found to be working (Blumberg, 1977, Merrick, 1977). The earning capacity of female heads seems to be considerably lower than that of males (Buvinić, Youssef and Von Elm), yet male secondary workers are found to be less utilized in poor households headed by women (Merrick, 1977) thus making such households more dependent on women's and, often, children's earnings (see Blumbery, 1977). In developing societies the absence of a welfare system suggests that a woman might well have to have both

independent access to employment and the contribution of some of her children in order to support her family. Children and marginal occupations seem to be complementary economic solutions to the survival needs of households headed by women.

The relationship between a "marginal" female labor force and a woman's economic responsibilities towards her family is not accidental. Income-earning activities that can be combined with child care are of the marginal and low income type. Women, who are the most adversely affected by the consequences of marriage/union disruption, are the least likely to be literate or trained vocationally to enter the labor force in a productive capacity. The earnings of female heads have been shown to come mostly from employment in the informal sector of the economy (Arizpe, 1977; CEPAL, 1973; JNPCE, 1973; Merrick, 1977).

How Many Are They?

The methodological problem. There are few sources of data on how many households in Third World countries have women as de jure (that is, recognized by the family and/or society) heads of household. Data on how many households have women as de facto, if not also as de jure, heads are almost nonexistent.

Very few countries include in their national census data specific tabulations of household heads by sex. Even fewer cross-tabulate this information by marital status, age, and economic activity. Ghana and the Commonwealth Caribbean are notable exceptions. The latter publishes two volumes of relevant information--one on the population by marital status and the other on the population by union status.[1] The union status of the population is included in the Caribbean census to specify family typologies; it provides probably the best available census information on women who are de facto heads of households. Countries such as Costa Rica, Guatemala,

[1] The difference between marital and union status in this case is analogous to the difference between de jure and de facto status.

Indonesia, Iran, Macau, the Philippines, Singapore, Turkey and Venezuela include a less ambitious, though fairly informative, profile of household heads that allows for considerable analysis. Similarly, regional and national demographic surveys in some African countries distinguish between female and male headship.

One drawback of the scant information that does exist is that there is no standard and unambiguous definition of the term head of household, particularly as applied to women. In its latest edition the United Nations Compendium of Housing Statistics (1972 - 74) defines head of household as "that person in the household who is acknowledged as such by the other household members." For sixteen countries for which we found definitions for head of household in their census manuals, eight followed the United Nations definition, four had other highly imprecise definitions (such as the definition of the 1970 Brazil Census: "that person responsible for the family"), and another four identified the head of the household as "that person who generally provides the chief source of income for the household unit." The last definition would have been a specific, operational definition of a de facto head of household, if the four countries using it had not added the following qualifier: "or who is regarded as such by other household members."

Because different countries use different definitions of head of household the data does not lend itself to cross-cultural aggregations or comparisons. The problem is complicated by the fact that most countries leave it to other household members to indicate who the household head is, which introduces into the data the cultural biases of both the respondents

and the census enumerators. In Middle Eastern and Latin American societies -- where male supremacy is the cultural ideal -- in the absence of the father a son of 12, instead of the wage-earning mother, will be cited or cite himself as household head. And, most probably, the wage-earning mother will continue to identify herself as "housewife." The result of these cultural responses is a gross underestimation of the number of women who are de facto heads of household.[2/]

In some sub-Saharan African countries an opposite cultural principle operates. In these societies the status of female headship is often recognized solely by virtue of age. An elderly widowed or divorced woman may be identified as household head even though, in fact, she may have no economic responsibility for household members. In these cases the way in which their future defines head of household results in overestimation of the number of women who are de facto heads of household.

Given these problems of definition how can we develop the aggregate measures and quantitative data that are needed if policy makers and planners are to grasp the existence, prevalence, and increasing spread of female-headed households in developing societies?

A provisional solution. Based on information derived from studies with sm samples we have developed a typology of women who in different parts of the worl functioning as de facto heads of household in the economic sense of the term. This typology includes widows, divorced and separated women, women who have previously lived in consensual unions, and unwed mothers. Obviously, not all women in these marital categories are de facto heads of household. Their

2/ Officials from census bureaus in Guatemala and Nicaragua brought the first cultural response cited above to our attention. M. Buvinić found that women who were de facto heads of rural households in Honduras consistently identified themselves as housewives.

marital status, however, structures a set of situational circumstances that, unless alternatives exist, demands that they function as economic providers for the household. Women in these marital categories carry the "potential" of being or becoming family heads -- a potential that will be realized unless alternatives (such as support from other family members) exist. The population of adult women in a country who, because of their current marital situation, carry the potential of being or becoming family heads is defined as all widowed, divorced, separated, and single mothers. The population of total potential household heads in a country will be defined to include the population of potential women household heads plus the population of potential men household heads, defined as all adult males who were ever married or who are currently in consensual unions. These two measures can then be used to find what percentage of total "potential" household heads are "potential" women household heads. Thus we have an index of the proportion of the population of women who might be heads of household. It should be noted that this definition fails to capture women who may be de facto household heads because of abandonment, male marginality, or male seasonal migration; statistically the marital union is usually considered intact--and the woman is recorded as married--regardless of the actual residence of the male spouse or the economic responsibilities the woman assumes.3/

Using data from United Nations Yearbooks and national censuses, we have calculated this index for 73 developing countries. The data is not detailed enough to allow us to distinguish between "household" heads (i.e., widowed, divorced or separated women living alone) and "family" heads (women living with dependents). This distinction is crucial in the United States, where the discrepancy between the two figures is caused by the large numbers of

3/ Because this index is a relative measure, the over-estimation in the number of women heads is compensated or by the over-estimation the number of total heads.

older women living alone (Ross and Sawhill, 1975), but is less central in developing societies whose female heads are much more likely to be family rather than household heads (Blumberg, 1977).

The Extent of the Problem

Table 1 divides the 73 developing countries[4/] into four groups, based on whether the percentage of total potential household heads who are women is low, medium low, medium high, or high. The percentage of potential household heads who are women ranges from a low ranking of 10 percent to a very high ranking of 48 percent. In the 73 countries for which United Nations and national census data are available, an average of 18 percent of the population of potential household heads are women (standard deviation (s) = 6.16).

As can be seen in table 1, there does not seem to be any geographical or cultural clustering. Asian, African, and Central and Latin American countries are represented in almost all four ranks, although Sub-Saharan African and Central American countries are barely visible in the low categories and make up the majority in the high categories.

The average percentage of potential households heads who are women is highest for sub-Saharan countries (22 percent) and lowest for South American countries (15 percent). But, as the ranking reveals, sub-Saharan countries also show the greatest variance in the proportion of potential female heads (standard deviation - 8.18) and South American countries the smallest variance (standard deviation - 2.67). In contrast to South America, in sub-Saharan Africa there are countries with very high and very low proportions of potential women heads to potential total heads of household. The average percentage of

4/ The Commonwealth Caribbean islands were excluded from this analysis. See Buvinic, M., Youssef, N.H. with Von Elm, B. "Women-Headed Households. The Ignored Factor in Development Planning" (report submitted to the Women in Development Office AID, April 1978) for a detailed analysis of data on actual women heads of household in the commonwealth Caribbean. Because of the richness of census information on de facto and de jure heads of households, we did a separate study of women-headed households in the Caribbean.

potential heads of household who are women is 20 percent for Central America and the Caribbean countries, and 16 percent for North Africa and the Middle East.

Table 2 provides a detailed breakdown by region and country of the composite variables from which the index of potential female headship was computed. It also specifies the marital status of female head of household.

The Widow

As can be seen in table 2, the largest group of potential women heads of household in all regions is made up of widows. Widows comprise, on the average, 91 percent of women identified as potential heads of household in Asia. The lowest propostion of widows among women who are potential household heads appears in Central America. In the seven Central American countries, on the average only half of the population of potential women heads of household are widowed. A closer look at these figures reveals that Asian countries have such a large fraction of widows among the potential women heads of household population because separated women are registered in only two countries (Sri Lanka and Thailand), and unwed mothers are registered in only one. In other words, women in most Asian countries are counted as either married, widowed, or single; no other status is recognized. On the other hand, Central American Countries show a relatively low proportion of widows among the population of potential women heads because separated women are counted and, in comparison to other countries, they are many. This is so because women who have left consensual unions are registered as "separated" only in Central America.

In assessing whether or not widowed women are economically responsible

for themselves and their children, it is crucial to distinguish between the cultural ideal and actual behavior. In many cultures the myth that other members of the family will assume welfare and protective functions toward widows is still sustained. However, it is becoming more and more difficult economically for a family to fulfill its duty toward a widowed daughter or sister, particularly if she is young and able to work. In Morocco, for example, where the cultural ideal is to protect the widow, almost one fourth of urban widows are economically active in the labor market. In traditional non-Islamic societies such as Nepal, one third of all widows are working; in the Philippines the corresponding proportion is 46 percent.

There are few alternatives available to widows, for their status is unlikely to change. Unlike divorcees, single mothers, and abandoned women, whose status may be transitory or transitional, the fate of widowed women is, in most cases, sealed.

All over the world the remarriage rate of widowed women is low, in absolute terms and in comparison to women in other marital statuses. Both age and the presence of children lessen the chance that a widow will remarry. The importance of both these variables in remarriage rates is striking in the rural areas of Northern India. Widow remarriage is a realistic possibility for women up to age 20. Ninety percent of widowed women below 15, and 80 percent of those between 15 and 19 years were found to remarry. After 20, however, their chances declined rapidly (Agarwala, 1967). Where life expectancy among males is low and age differences between spouses is considerable, the chances are high that there will be a large number of widowed women. In rural Nigeria it has been estimated that if a girl aged

15 marries a man ten years her senior, and if she survives to age 50, the chances are only one in two (45 percent) that her husband will survive until the end of her reproductive period. If she marries a man fifteen years her senior, the probability of his survival until she reaches age 50 is 30 percent (Mott, 1974).

Migration also has an impact upon the widow's chances for remarriage. The heavy migration of Latin American women into cities has produced a considerable disparity in the ratio of unattached males to unattached females; in the 1960s in urban Chile, for instance, there were 250 potentially marriageable females in the 35-55 age group for every 100 potentially marriageable males of the same ages. Under those circumstances there will be few chances for a widow to contract a union.

The Divorced or Separated Woman

Few countries outside of Central America record separated women. Cyprus is the only country in North Africa and the Middle East that uses that category. On the average, only 13 out of 100 North African and Middle Eastern women who are potential heads of household are divorced. The rest are widows. In Asia, only Thailand and Sri Lanka acknowledge a separated status. South American countries generally combine separated and divorced women in one category. In sub-Saharan Africa, an average of 22 percent of potential women heads of household are divorced or separated. In South America the average percentage is 1 percent, and in Asia 9.2 percent. On the average, 25 out of 100 women potential heads of household in Central America are separated and

9 out of 100 are divorced.

In recent years significant trends have emerged in those societies where male kin have traditionally provided full financial and social support to a divorced female relative -- an obligation which, at least in Islamic societies, was unquestioned. The labor force statistics show clearly that in the Middle East divorced women have begun to support themselves. A comparison between the economic activity rates of widowed women and those who are divorced suggests that kinship units do not provide economic support for divorced female relatives to the same extent that they do for widowed relatives. In Egypt and Iran the propensity for divorced women to be employed in the urban economy is three times as high as it is for the widow; in Syria and Morocco it is twice as high, in Turkey it is five times as high. In these Muslim countries, one third of all the divorcees are in the formal labor market. In urban Morocco one divorced woman in three is counted as economically active (see table 4). Divorcees, in fact, make up over 30 percent of the entire female work force, as they do in some areas of Latin America. The same is true in Singapore and Nepal. In fact, in all countries divorced and separated women emerge as the marital group most in need of work, judging by their involvement in the labor force.

The Single Mother

Data for single mothers were available for only two countries in Africa, three in Central America, and three in South America. In Mozambique and Honduras single mothers are less than 20 Percent of the potential women heads

of household. For Colombia and Peru, respectively, 38 percent and 29 percent of the potential women heads of household are single mothers; for Botswana, Chile, and Panama the proportion is higher: half or more of those women who are potential heads of household are single mothers.

A useful indicator of the extent to which women are burdened by child dependency is the child/mother ratio--that is, the ratio of the number of children ever born to the number of women who have borne children. Table 3 summarizes the child/mother ratio for single as well as for widowed, divorced, and separated mothers for the countries mentioned above. The ratio of children to single mothers presented here is a conservative estimate, since we have included in our count only the fertility of women whose parity is specified and have excluded those women who may have had children, but whose exact parity is unknown. On the average, the ratio of children to single mothers ranges between 2.2 and 3.4. It is highest for Peru and Guatemala and lowest for Chile.

In Peru and Colombia the census identifies a considerable number of single women for whom exact parity is not known. In the case of Peru, if we exclude such women from the single mother category, single mothers comprise 26 percent of all adult single women. However, if we consider the group of single women for whom the exact number of children born is not specified as de facto mothers, and combine them with those single women for whom parity is known, then the single mother category in Peru rises to 66 percent of all adult (15 and over) single women. In Colombia, the differentials between the

two computations are also considerable. Excluding single women for whom specific parity is unknown from the count, single mothers comprise close to 25 percent of the adult single population. When single women with unknown parity are included, single mothers become 48 percent of the adult single female population in Colombia.

Using conservative estimates, it is possible to say that the average single mother in these countries has had two children. In Caribbean and Central and South American countries it is highly likely that this mother carries at least the economic burden of supporting her children.[5/] Many times, they also seem to carry a psychological burden. In-depth interviewing among a group of 100 single mothers in a maternity ward in Guatemala City pointed to the great fear and anxiety these young women expressed with respect to their parents' anger and rejection as a result of their pregnancies. Some of the young mothers suffered from acute depression and feelings of despair about their futures. None lived with their parents; only two among the 100 lived with the father of the child. The majority had been unemployed before delivery. They all knew they alone were economically responsible for providing for their children (Villalta, 1971). In Mexico, a study of women working in the coffee plantation in a mountain village in Sierra de Juarez, Ozxaca, identified "single mothers" as experiencing the greatest difficulties. Quoting Kate Young's research, Ingrid Palmer writes:

> They [single mothers] have usually been disinherited or abandoned by their families. Always beholden to landowners' Wives who employ them fully at harvest time to pay off "gifts" received during the years, their needs are the greatest, their means are the least (Palmer, 1976).

5/ It is important to exercise considerable caution toward the cultural relativity argument that some social scientists apply to these countries. Essentially, this argument proposes that consensual unions and reproduction outside of marriage in Latin American and Caribbean societies are culturally accepted alternatives to formalized marriage and legitimate fertility. Caution should also be exerted when stating that nonlegal unions are coping mechanisms for women and men in lower income groups; this explanation should not be viewed as implying that nonlegal relationships and their consequences are socially approved of and accepted by society.

The social context in which reproduction outside of marriage takes place in sub-Saharan Africa and the consequences of childbearing for the unwed mother have not been clearly established. If the incidence of single mothers reported for Mozambique and Botswana--20 percent and 45 percent of all adult single women respectively--reflect childbearing that is taking place in rather frail and unstable "mutual consent" unions, it is conceivable that economic responsibilities rest upon the mother alone. It is unlikely, however, that all of these children are being born to unstable unions. A more plausible explanation is that some customary or contract marriage are not being granted recognition by census personnel because either the dowry or the dot have not been paid. The women may be cited officially as "single," even though they may be living in de facto stable unions.

Women in Consensual Unions

In almost all parts of Central and South America and in the Caribbean Islands there are three basic types of unions: "visiting" (mostly in the Caribbean), consensual unions, and legalized marriage. Of the three, only marriage carries a legal sanction. Childbearing takes place in all three types of unions. In consensual living arrangements (unlike marriage), both partners bear economic responsibilities.

Low wages and high male unemployment are factors that obviously contribute both to male preference for nonlegalized unions (as opposed to marriage) and to the breakup of such unions. The absence of legal sanction has made it easy for men to break away from such relationships without

assuming any economic responsibility. Even when they are willing to assume such responsibility, they are often unable to do so. The dissolution of a consensual union places a woman in a position similar to that of the widow or divorcee but without any of the rights and reciprocities she would have had from a legalized union. For civil and statistical purposes, dissolution of a nonlegalized union generally moves the women from "in consensual union" status to "single" status. In most Central and South American countries childbearing in a nonlegalized relationship automatically places the offspring in an "illegitimate" category. This explains why illegitimacy rates in these countries are so high--e.g., Venezuela .53 percent; Peru .49 percent; Paraguay .43 percent; Ecuador .32 percent.

Because most census schedules exclude questions on marital history, it is impossible to estimate dissolution rates for consensual unions. The micro literature indicates an average of three unions for women before they reach the end of their reproductive period (Safa, 1965; Blake, 1961). Economic hardship is at the root of much union disruption; it is also the catalyst that pushes women into contracting successive relationships as the only option available to them for economic survival.

The Increase of Households Headed by Women: Migration and Urbanization

One of the most prominent trends accompanying modernization in Third World countries has been the migration to the cities that was triggered by actual or perceived economic opportunities during the early stages of economic development The proportion of men and women among the migrants varies sharply by regions. The

industrial centers of Europe have attracted male and female migrants from Middle Eastern and North African countries. The oil-producing countries are now "pulling" large numbers of male migrants from neighboring Middle Eastern countries. In the "pull" from rural to urban areas within countries, males seem to predominate in Africa and females appear to predominate in South America.

Many Moroccan men have migrated to the industrial cities in Western Europe. This factor, interacting with rural-urban migration, considerable male unemployment, and high divorce rates, has forced uneducated and poorly trained Moroccan women to assume the primary economic responsibility for themselves and their children. Changes in household composition between 1960 and 1971 reflect this fact. A comparison of the two censuses reveals, first, that while the number of households headed by men has increased minimally, the number of households headed by women has increased by 33 percent. Second, households headed by females are not restricted to divorced or widowed women, although these clearly form the majority; 14 percent of all female-headed households are headed by women who are married (though it is not clear whether the husband is actually present in the house); 83 percent are headed by women who are divorced or widowed. The greater burden that women must cope with is also shown in the fact that female-headed households tend to be larger than those headed by men.

It is estimated that up to two thirds of the male work force of the Yemen Arab Republic is migrating to find work in the Saudi Arabian oil fields (Olin, 1978). Frequently all the men between the ages of 15 and 40 will emigrate from a Yemeni village for periods of up to three years, leaving the

women under the care of younger and older men. As a result, the women carry still greater workloads. When the man is present, the woman only sows seeds in the field. When he is absent, she carries out almost all agricultural tasks. Women's overwork diminishes the number of crops that can be planted and adversely affects infant feeding and care (Swanson, 1975).

The discovery of minerals, the planting of cash crops, and the demand for skilled labor have led to internal rural-rural and rural-urban migration of African men to mines, plantations, and cities. The traditional family has disintegrated. Women are left with the double burden of being homemakers and providers (Dobert and Shields, 1972). In Kenya, Hanger and Moris observe that one of the effects of an irrigated rice scheme is the migration of men who many times return home only to organize labor at peak work periods. Women are left alone to tend both the rice and traditional food plots (1973). The phenomenon of male outmigration in search of wage employment is illustrated in the case of Kenya's Kakamega district, where male outmigration is among the highest in the country. A full 40 percent of the district sample studied by Staudt (1975-76) consisted of women farm managers. This corresponds with figures in the 1969 census, which show that in that district 36 percent of all households were headed by women. The common pattern in Kakamega, as elsewhere in Kenya, is for men to engage in wage employment away from the farm and to return home only upon retirement.

In Basutoland (Lesotho), the structure of households varies with size and season, but the basic picture shows a constant imbalance of the sexes. Even without the migration factor, there are significantly more women than men. Among tax-paying households, 25 percent are headed by women. Zulu men in

South Africa migrate to the cities. Zulu women are left behind with their children (Sibisi, 1976).

In Latin America, more women than men migrate from rural areas and small towns to the cities. Female migrants are consistently younger than male migrants and tend to migrate without spouses (Elton, 1974). One consequence is the formation of households headed by women. In the metropolitan regions of Rio de Janeiro and São Paulo there are almost half a million households headed by women. In the Rio region one in every six households, and in São Paulo one in every eight households, is headed by a woman (Van da Costa, n.d.). A study in Santiago, Chile, revealed that most of the households with children that were headed by women were headed by migrant women. More importantly, analysis of median monthly income indicated not only that households headed by women were poorer than those headed by men but also that those headed by migrant women were the poorest of all. The median monthly income was 109 escudos for households headed by native men, over 93 escudos for those headed by migrant men, and 84 escudos for those headed by native women. Women who migrated before 1952 had a median monthly income of 70 escudos, whereas more recent migrants (those who migrated between 1952 and 1963) received only 49 escudos monthly (Elizaga, 1970).

Since a majority of women migrants to urban centers are young and single, the higher incidence of women-headed households there may be caused by the of the interaction several factors: The concentration of industrial and commercial activities in a few urban locations and the traditional division of labor--which give women more income-earning opportunities in towns (as domestic servants and petty traders)--"pull" women to urban areas; the change to a cash-based economy that has lessened women's contribution (in comparison to men's)

to the economic support of the family in rural areas "pushes" women out of rural areas (Elton, 1974).

The presence, because of migration, of more younger women than younger men in the cities may create a tight marriage market and a consequent rise in "visiting" relationships and sporadic consensual unions. At the same time, the city offers abandoned women with dependents and women in "visiting" unions not only relatively higher economic security, but also the absence of social sanction. In her study, Nieves (1977) found that women in San Salvador who had families to support preferred city to rural life, while women married to working men preferred rural life. Men preferred city life more than their wives did but less than did women heads of household.

The perceived advantages of urban living in Latin America may, however, be a trap for women who are the main economic providers for their households. They may migrate to the cities in search of economic opportunities and more freedom, but what they find are marginal or barely subsistence earnings and the absence of institutional supports for the double burden of motherhood and working.

What Next? Areas of Inquiry

This preliminary assessment clearly shows that households headed by women in developing societies are and will be increasing in numbers as development (i.e., migration and urbanization) proceeds, and that they are and probably will continue to be "the poorest of the poor" unless there is intervention at the policy level. The formulation of national policy will be helped by research efforts in the following areas.

The Definitional Issue. Experts from statistical offices at both national and international levels have to reach agreement on a standard definition of the term "head of household." Such a definition should reflect the actual economic responsibility of family members. It could then serve as a frame of reference for national and international data collection and for studies on women-headed households in developing societies.

Many countries which do not publish statistics on heads of household have such data available in some form. Often these data are tabulated but not published, or are available in raw form. Statistical offices in such countries could be given technical and financial support to analyze and publish information on heads of household by family composition, sex, age, economic activity, and income. A coordinated effort in this direction would yield a more precise quantitative portrayal of the situation of women heads of household, though admittedly it would not solve the problem of identifying women who function as de facto heads. It would, however, establish a frame of reference for micro studies.

The Economics of Women Heads of Household. The economic condition of households headed by women in rural, marginal, and urban areas should be investigated. How these families make a living, with particular emphasis on the economic activities of children, must be assessed. This vast area of inquiry should cover in-depth studies of family economics in rural areas, and studies of the structure of the informal labor sector, with special focus on functions performed and earnings accrued by women and their children in marginal areas.

Familial Context of Households Headed by Women. Census and survey questions should be designed to tap the changing composition and structure of households headed by females. More information is needed on the dynamics

of such households in terms of their formation, different living arrangements over time, and the importance of supportive networks in enabling such units to survive -- both economically and psychologically. To capture this dynamic process, it is important to introduce time as a variable in structuring questions related to household composition -- be this in census schedules or survey interviews. An open question might ask if and how the composition of the household varies over time. Fixed questions might simply ask what members were present in the household at two specified points in time over the year.

In-depth studies which probe into the institutional support provided to women who are currently not married are imperative. This is particularly true of those societies traditionally characterized by a protective kinship structure which are now experiencing rapid economic transformation. Conceivably, such studies could sample divorced women and widows in different age groups in order to better understand the changes in their lives and to assess the economic reality in which they function.

The Migration Factor. Current migration studies identify rural to urban and international migration patterns. There is evidence that migration occurs in smaller steps. For instance, in Latin America it is believed that women migrate from place of origin (usually rural) to other rural areas, to smaller towns, and then to cities. This step-wise migration among women should be researched in detail, with specific emphasis on the conditions and circumstances surrounding women in each successive step.

Not only do successive migration patterns need to be researched, but the crucial question of what motivates women to migrate to towns and cities -- where they actually might be worse off economically -- should be a subject of study. Both the short-term non-economic payoffs and the long-term economic payoffs of migration for women (for instance, the invest-

ment made in the future of their children) should be studied. Longitudinal studies as well as cross-sectional designs which include a time dimension should be incorporated in the research on migration patterns of women heads of household.

Male migratory trends need to be assessed in terms of the impact they have on women in general, and on the emergence of female-headed households in particular. There are several dimensions to this broad topic, such as how long the men have been migrating, how dependent women have traditionally been on men, the economics of the place of origin, and the traditional economic division of labor by sex. The impact of male migration upon women can be traumatic and disruptive in certain instances; it can also in the long run contribute to women's growth in the direction of more independency and self-reliance.

In general, and regardless of the specific subject matter that is to be investigated, concerted efforts should be made among researchers to replicate micro studies with larger samples of populations. Social scientists should be made aware of the importance of coordinating their research activities in such a way as to contribute to a comprehensive picture of family headship among poor women. Ideally, a standard design should be replicated in different countries and in different areas within countries. Such an effort should incorporate the excellence of academic standards; the design of the research, however, must be directed specifically to project planning, so that the results obtained can be used by the practitioners.

Table 1. "Potential" Female Heads of Households as Percentage of "Potential" Total Heads of Household, by Country

Low (10%-14%)	Medium Low (15%-19%)	Medium High (20%-24%)	High (25% and over)
		South America	
Argentina	Bolivia		
Ecuador	Brazil		
Mexico	Chile		
Paraguay	Colombia		
Peru	Uruguay		
Surinam			
Venezuela			
		Central America	
	Nicaragua	Guatemala	El Salvador
		Honduras	Panama
		Caribbean	
Costa Rica	Bahamas	Guadaloupe	Virgin Islands
	Cuba		
St. Pierre	French Guiana		
and Miquelon	Martinique		
	Puerto Rico		
		Sub-Saharan Africa	
	Gabon	Chad	Botswana
	Kenya	Congo	Lesotho
	Liberia	Madagascar	
	Niger	Mauritius	
	Reunion	Mozambique	
	Rhodesia	Tanzania	
	Zambia	Togo	
		Uganda	
		North Africa and Middle East	
Cyprus	Bahrein	Algeria	
Kuwait	Iran	Morocco	
Turkey	Iraq	Yemen	
United Arab	Jordan		
Emirates	Lebanon		
	Libya		
	Syria		
	Tunisia		
		Asia	
Brunei	Cambodia	Indonesia	
Hong Kong	India	S. Korea	
Nepal	Macao	Vietnam	
Philippines	Singapore		
Sri Lanka	Thailand		
Taiwan			
Rodriguez			

Table 2. Potential Heads of Households, Potential Women Heads of Households, and Marital Status of Women Heads by Country

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mother (2)
SOUTH AMERICA								
Argentina**	1970	8,101,600	1,027,400	13.0	84.0	16.0		-
Brazil**	1970	19,302,767	3,277,884	17.0	71.0	-	29.0	-
Bolivia**	1976	11,213	2,016	18.0	82.0	18.0		-
Chile**	1970	2,386,757	771,761	32.0	35.0	10.0		54.0
Colombia**	1975	3,874,307	956,107	25.0	47.0	15.0		38.0
Equador**	1974	1,287,553	185,269	14.0	65.0	6.0	29.0	-
Paraguay**	1972	392,370	45,120	11.0	77.0	23.0		-
Peru**	1972	2,894,522	554,567	19.0	57.0	2.0	12.0	29.0
Surinam**	1964	53,006	6,861	13.0	66.0	34.0		-
Uruguay**	1963	694,005	115,048	17.0	85.0	15.0		-
Venezuela**	1974	1,754,974	198,200	11.0	82.0	18.0		-

** Data obtained from National Censuses

*** The single-mother category includes only those women for whom parity is specifically indicated. It excludes those single women for whom the exact number of children borne is unknown.

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
CENTRAL AMERICA								
Costa Rica**	1973	322,707	44,282	14.0	64.0	8.0	28.0	-
El Salvador***	1974	120,309	35,105	29.0	41.0	11.0	48.0	-
Guatemala**	1973	1,141,442	232,655	20.0	53.0	-	-	47.0
Honduras**	1974	573,762	150,804	26.0	35.0	4.0	51.	11.0
Mexico**	1970	9,556,649	1,369,118	14.0	71.0	7.0	22.0	-
Nicaragua**	1971	334,113	57,515	17.0	71.0	29.0	-	-
Panama**	1970	420,228	167,847	40.0	15.0	2.0	24.0	59.0

** Data obtained from National Censuses, National Statistical Yearbook.

*** Metropolitan Survey.

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
CARIBBEAN								
Bahamas**	1970	35,127	6,735	19.0	65.0	5.0	29.0	-
Cuba**	1970	2,124,207	310,769	15.0	59.0	41.0	-	-
French Guyana**	1967	6,053	1,038	17.0	80.0	20.0	-	-
Guadaloupe*	1967	48,590	9,510	20.0	86.0	14.0	-	-
Martinique	1967	48,101	9,279	19.0	87.0	13.0	-	-
Puerto Rico*	1970	1,293,195	188,601	15.0	44.0	18.0	3.7	-
St. Pierre** & Miquelon	1974	2,220	311	14.0	93.0	7.0	-	-
Virgin Islands***	1970	6,773	2,502	37.0	49.0	32.0	19.0	-

* UN Demographic Yearbook, 1972. Table 26;
UN Demographic Yearbook, 1971. Table 12.

** Data obtained from National Censuses, National Statistical Yearbook.

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
NORTH AFRICA MIDDLE EAST								
Algeria*	1966	2,911,600	656,300	22.5	85.9	14.1	-	-
Bahrein**	1971	49,772	7,839	15.7	83.1	16.9	-	-
Cyprus**	1973	171,486	23,433	13.6	88.5	5.8	5.7	-
Iran**	1966	5,989,954	936,704	15.6	91.9	8.1	-	-
Iraq*	1965	1,711,723	299,507	17.4	93.7	6.3	-	-
Jordan**	1961	359,283	62,291	17.3	93.5	6.5	-	-
Kuwait**	1970	180,562	18,839	10.1	84.3	15.7	-	-
Lebanon**	1970	427,500	66,435	15.5	91.9	8.1	-	-
Libya*	1964	380,963	66,165	17.3	78.6	21.4	-	-
Morocco*	1971	3,478,236	758,233	21.8	77.2	22.8	-	-
Syria*	1970	1,178,333	177,018	15.0	92.9	7.1	-	-

* UN Demographic Yearbook, 1972. Table 26;
UN Demographic Yearbook, 1971. Table 12.

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mother (2)
NORTH AFRICA MIDDLE EAST								
Tunisia*	1966	979,971	165,428	16.8	88.8	11.2	-	-
Turkey**	1975	8,554,731	1,252,347	14.6	93.2	6.8	-	-
United Arab Emirates*	1968	55,943	7,778	13.9	81.6	18.4	-	-
Yemen (PDR)**	1976	947,198	195,287	20.6	85.6	14.4	-	-

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
SUB-SAHARAN AFRICA								
Botswana**	1971	136,381	62,693	45.9	32.3	18.0	2.1	47.6
Chad*	1964	627,510	151,440	24.1	-	-	-	-
Congo*	1961	146,300	31,200	21.3	-	-	-	-
Gabon**	1961	147,033	29,116	19.8	83.9	16.1	-	-
Kenya**	1969	2,118,417	396,922	18.7	76.2	23.8	-	-
Lesotho**	1966	189,886	70,553	37.1	90.0	10.0	-	-
Liberia*	1971	347,332	59,413	17.1	66.0	34.0	-	-
Magadascar*	1966	1,476,000	323,000	21.8	51.7	48.3	-	-
Mauritius*	1972	154,376	34,249	22.2	81.2	2.1	16.7	-
Mozambique**	1970	1,989,505	501,706	25.2	53.2	26.9	.4	19.4
Niger**	1960	659,970	105,550	15.9	86.5	13.5	-	-

* UN Demographic Yearbook, 1972. Table 26;
UN Demographic Yearbook, 1971. Table 12.

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
SUB-SAHARAN AFRICA								
Reunion**	1967	77,579	14,638	18.9	87.7	12.3	-	-
S. Rhodesia**	1969	73,781	12,095	16.5	71.2	19.6	9.2	-
Rodriguez*	1962	8,414	435	12.1	77.1	.2	22.7	-
Rwanda**	1970	-	124,140	-	79.5	20.5	-	-
Tanzania*	1967	101,351	24,954	24.7	34.0	66.0	-	-
Togo**	1970	366,888	74,246	20.2	83.2	16.8	-	-
Uganda**	1969	2,103,278	427,675	20.3	57.6	42.4	-	-
Zambia**	1969	920,300	181,228	19.6	43.6	56.4	-	-

* UN Demographic Yearbook, 1972. Table 26;
UN Demographic Yearbook, 1971. Table 12.

** Data obtained from National Censuses, National Statistical Yearbook

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages) Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
ASIA								
Brunei**	1971	27,979	2,950	10.5		100.0	-	-
Cambodia**	1962	1,335,211	219,661	16.4	85.8	14.2	-	-
Hong Kong**	1971	843,945	109,113	12.9	96.6	3.4	-	-
India**	1961	127,717,119	24,052,260	18.7	95.6	4.4	-	-
Indonesia**	1971	30,132,002	6,967,705	23.3	78.2	21.8	-	-
S. Korea**	1970	7,080,421	1,487,810	21.0	94.5	5.5	-	-
Macao*	1970	47,472	7,837	16.5	97.1	2.9	-	-
Nepal**	1971	3,092,849	318,432	10.3	96.5	3.5	-	-
Philippines**	1970	7,035,753	969,292	13.7	89.9	10.1	-	-
Singapore**	1970	439,867	75,540	17.0	94.3	5.7	-	-

* UN Demographic Yearbook, 1972. Table 26
** UN Demographic Yearbook, 1971. Table 12

Table 2 (continued)

	Year	Potential Heads of Households (1)	Potential Women Heads of Households (2)	Potential Women Heads as percentage of Total Potential Heads of Households	Marital Status of Women Heads (percentages)			
					Widows (2)	Divorced (2)	Separated (2)	Single Mothers (2)
ASIA								
Sri-Lanka**	1971	2,620,933	358,424	13.6	93.4	3.4	3.2	-
Taiwan**	1970	3,094,541	360,328	11.6	91.9	8.1	-	-
Thailand*	1970	7,309,338	1,228,241	16.8	75.2	9.5	15.3	-
Vietnam**	1972	1,114,679	274,216	24.6	100.0	-	-	-

Table 3.

Child/Mother Ratio for the Female Population

According to Specific Marital Categories

For Selected Countries, 1970

COUNTRY/YEAR		All Mothers	Single** Mothers	Widowed Mothers	Divorced Mothers	Separated Mothers
BOTSWANA	1971	4.5	2.9	5.1		
CHILE	1970	4.1***	2.2***	5.0***		
COLOMBIA	1973	4.3	2.8****	5.1	4.1	
GUATEMALA	1973	5.7	3.3	6.0		
HONDURAS	1974	3.4	3.2	6.6		4.4
MOZAMBIQUE	1970	3.9	2.6	4.1		
PERU	1972	5.3	3.4****	6.8	3.4	4.8
CARIBBEAN ISLANDS*	1970					
JAMAICA		4.2	2.9	4.6		
TRINIDAD		4.5	2.6	4.9		
GUYANA		5.0	2.9	5.1		
BELIZE		5.1	3.4	5.3		

* Caribbean data includes women 14-64 not attending primary/secondary school levels by Union status.

** Single Mothers in the Caribbean data include women (with children) in visiting relationships, those who "never had" a relationship and those "no longer with common-law partner."

*** Data based on number of children born alive and dead to all mothers.

**** Denominator excludes single women for whom exact parity is unknown.

Table 4.

Marital-Specific Activity Rates For Female Population, Aged 15 and over, 1970

COUNTRY	Year	Marital Specific Activity Rates				
		All Women	Widowed	Divorced	Separated	Single Mothers
Argentina	1970	24.0	15.0	57.0	-	
Chile	1970	22.0	22			40.0
Costa Rica	1973	21.0	12.0	50.0	34.0	
Iran	1966	12.4	11.0	30.0	-	-
Liberia	1971	31.0	21.0	26.0	-	-
Morocco	1971	8.0	17.0	32.6	-	-
Nepal	1971	41.0	34.0	49.0	-	-
Philippines	1970	34.0	47.0	53.0	-	-
Singapore	1970	30.0	15.0	48.0	-	-
Syria	1970	9.0	9.0	18.0	-	-
Turkey	1975	11.0	7.2	37.1	-	-

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NOTE: This study has used statistics from national censuses, UN Statistics and World Tables too numerous to reference individually. Specific references can be obtained by writing to the International Center for Research on Women, 1010 16th Street N.W., 3rd Floor, Washington, D.C. 20036.

The Economics of Marriage, Women, and Development

Amyra Shechtman Grossbard
Population Research Laboratory,
University of Southern California

Much of a woman's working life occurs within her home and in her capacity as wife. When they marry, most women make or accept decisions about what work they will do, both within the household and outside it. Since marriage so influences the decisions of almost half the world's population about wage employment, it seems desirable that the study of marriage be included in the analytical framework of research on women, work, and poverty. Interestingly, such study is rare. While there has been plenty of theoretical investigation of work and earnings outside the home, little has been done with regard to developing a theory applicable to work inside the home. And the studies of marriage that have been done have not led to the practical, policy-relevant insights that have been achieved by studies of the labor force. This asymmetry can be reduced somewhat by extending the scope of economic analysis, the conventional tool for studying (paid) labor, and applying it to marriage.

The economics of marriage can improve our understanding of women's productivity in the household, provide direct ways of measuring women's contribution to household production, and

lead to new policy suggestions. The theoretical framework should be particularly useful for studying women in less developed countries, for women in those countries spend more time in noncommercial work than do those in industrialized countries, and the need for finding ways of measuring their production seems correspondingly greater.

The theoretical framework introduced in the next section is economic in the general sense that it relies on basic concepts common to economic models. While sociologists and demographers have long been aware of the existence of marriage markets (see, for instance, the concept of a "marché matrimonial" outlined by Louis Henry in 1975), it is only recently that economists have applied neoclassical demand and supply analysis to the study of marriage (Becker, 1973; Grossbard, 1976, 1978a). Beyond the model, this paper is multi-disciplinary for it relies on information and theoretical insights from other disciplines--anthropology in particular--and delves into issues usually studied by sociologists, demographers, psychologists and anthropologists.

The Economics of Marriage

The analytical tools designed by economists for the study of labor markets can be used to analyze determinants of employment and total wages (including the extra benefits or disadvantages of a job); they also contribute to an understanding of changes over time and of differences among countries and individuals. The same tools can be applied to the economics of marriage, for married women can be viewed as employed in the provision of wife services: they work

as wives. As in the case of other types of employment, working conditions depend on the level of "wages" earned, the length and stability of "employment," and fringe benefits and/or unpleasant features of the job. Like conventional labor economics, economic analysis of the marriage market attempts to ascertain the determinants of employment and work conditions. In its empirical applications it focuses on the reasons for the variability in married women's employment and work conditions over time, across individuals in one culture, and across cultures.

The market analyzed here is the one for "wife services," for the essence of marriage consists in its contribution to family formation, a task for which women possess specialized skills. Consequently, in all human societies husbands normally act as net providers of material and other benefits to wives (wives may also be gross providers of such benefits). When children are an important product of marriage, the wife expects benefits in compensation for her motherhood services (as well as for, perhaps, other services for which she is a net supplier). Such benefits may be either material (goods for her personal consumption) or emotional in nature (Grossbard, 1978a). In order to facilitate comparison of marriage markets with other labor markets, these benefits will be called "wife wages," although they contain a larger nonmonetary component than ordinary wages.

Wife wages in a particular marriage market are determined by the aggregate supply of and demand for wife services; i.e., they depend on the total interest in marriage on the part of all women and men in a particular society. Figure 1 represents such a marriage market. The point at which the "supply" curve (which shows the aggregate amount of wife services that the women in a society are willing to provide at different wife wages) and the "demand" curve (which shows

the aggregate amount of such services demanded by men) intersect is the point at which wife wage and wife employment level are in equilibrium (W*,L*).

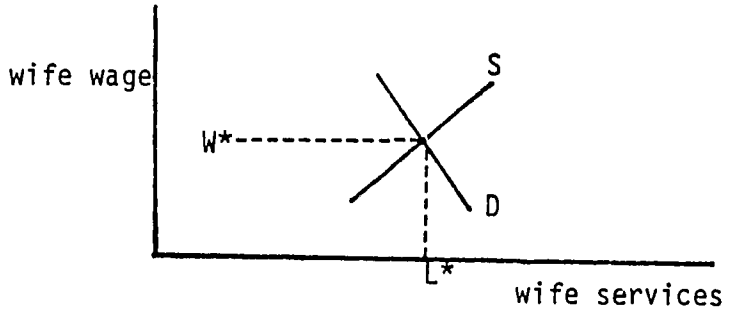

Figure 1 Market for Wife Services

The model can be expanded to include different categories of wife services (separate markets will establish different wife wages) as well as common restrictions (such as the rules about monogamy or minimum age at marriage) on the operation of the market(s). (For more elaboration on marriage markets, see Becker, 1973, and Grossbard, 1976.) This simple model, then, can offer insights into a wide variety of women's productive activities, but because it has been developed only recently, the full range of its applications has not been explored.

Education as a Determinant of Wife Wage

We know that more schooling can help break the poverty cycle by increasing earning power, and that the mother's education helps the next generation by adding to the children's human capital. The

question here is whether education also leads to higher wages in the marriage market. If the latter relationship could be established, it would provide an additional way to estimate the benefits of education for women.

While it is easy to test directly the hypothesis that education leads to higher productivity, which leads to higher wages in the labor market, indirect measures are necessary to determine whether the same is true in the market for wife services.

The discussion that follows is taken from analyses I have done of data from Nigeria (Grossbard, 1976) and Guatemala (Grossbard, 1978a). Both countries have marital institutions (polygyny and informal marriage, respectively) that are unusual by our own standards. The nature of these marital institutions are such that they can provide insights into the determinants of productivity in the marriage market.

In a polygynous society like that of northeastern Nigeria, for instance, men can obtain more wife services in two ways: by choosing a more productive wife and/or by having more wives. My analysis shows that when other characteristics, such as wealth of husband and age of husband are held constant, the number of wives decreases in relation to the years of schooling of the wives. This finding seems to confirm the view that schooling improves a wife's productivity. The argument would be reinforced if it could also be shown that all women prefer to have fewer co-wives, for then a smaller number of co-wives would represent an element of wife wages. If a woman could replace one or more additional wives through her increased productivity, she would obtain the privilege of being an only wife.

The smaller number of co-wives would then represent an element of her wife wage.[1]

In analyzing data from a 1974 survey of six villages in Guatemala, I focused on a different aspect of the marriage market, namely the widely available choice between formal and informal marriage (Grossbard, 1978a).

Formal marriage is a benefit to women, because it represents a commitment, just as being assured of tenure benefits workers by reducing the risk of unemployment. An additional advantage of formal marriage is that the children have easier access to their father's inheritance. Consequently, Guatemalan women eligible for a higher wife wage will tend to translate such "earning power" into a formal marriage contract. If women who are more educated get higher wife wages, one expects them also to be more likely to marry formally. Analysis of the data shows that even when other characteristics of women, men, and villages are taken into account additional schooling[2] significantly increases a woman's chances of marrying formally.

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[1] Interestingly, the study shows that male schooling has a positive effect on a number of wives, for men with a higher permanent income can afford more wives. It should be pointed out that the overall level of schooling for women in the study was very low: the mean number of years of schooling was .34; a majority of women had no education whatsoever; and for those who had some, it consisted mostly of one year of religious (Muslim) schooling.

[2] The average years of schooling for the women in the sample were 1.9.

Other Determinants and Indicators of Wife Wage

There are other factors besides education that determine the wife wage, by affecting either demand for or supply of wife services. First, the larger the aggregate demand for wife services, the better the working conditions for women choosing to specialize in wife services. For instance, in high fertility cultures there is a high demand for wife services, and therefore it may be hard for a woman to find an occupation that will pay her a wage comparable to the wife wage. The demand for wife services will also be high if there are few available substitutes for specific wife services, such as servants, restaurants, prostitutes, or day-care centers. Second, the ratio of women to men in a society also affects the wife wage: the more women of marriageable age there are in relation to the number of men, the lower the expected wife wage.

All of these factors (education, fertility, substitutes, and sex ratio) are examples of determinants of both the level and the conditions of employment in the market for wife services. The wife wage -- a general indicator of the conditions of employment -- is composed of a number of components that vary from culture to culture, the number of wives and marriage formality being only two particular examples. Other sources of information on both wife wage and wife employment are data on time budgets (including time spent in seclusion), transfer payments, and protection at separation (e.g., alimony).

Time budget studies (for instance those by DaVanzo and Lee and Evenson and Quizon presented at this conference) are a valuable source of information on work conditions of women in the home. A higher wife wage (i.e., better work conditions for the wife), could, for instance, be reflected by a smaller proportion of time devoted to strenuous physical tasks and a larger number of hours of help in activities typically included among the wife services. Such help could come from the husband, the children, or outside workers. Hypotheses that could be tested by analyzing time budget data might be, for example, 1) that women with more schooling receive more hours of help in activities included among the wife services of a particular culture; 2) that if the sex ratio goes down (fewer men available due to, for instance, war) the wife wage will be lower, and therefore women who get married will spend more time at strenuous physical tasks.

Seclusion, an institution whereby a wife's movement outside the home is totally or partially restricted, is also an indicator of the level of wife wage. In one sense, this is an advantage in that women living in a predominantly agricultural society will be exempted from strenuous work in the fields; on the other hand, however, the confinement involved may exert a heavy psychic toll on a woman, and therefore she may try to avoid such situations. In the latter situation, women accepting seclusion may be the ones with a lower wife wage.

Transfer payments at marriage are relatively straightforward indicators of the wife wage. One can infer that in a culture where dowry is paid (i.e., a woman, or her family, has to pay for the privilege of getting married), the equilibrium wife wage is probably low.

The opposite situation -- payment of bridewealth -- reflects favorable market conditions for women: men have to pay before they can obtain wife services.[3] In terms of shifts in the demand for wife services, higher demand also leads to higher bridewealth. Since polygyny increases the demand for wives, it follows that bridewealth payments should be higher in sectors of a society where polygyny is more common. Available evidence confirms such a relationship between type of transfer at marriage and polygyny.

Cross-culturally, dowry is strongly linked with monogamous (and polyandrous) marriage, while the institution of brideprice is more often found in polygynous than in monogamous societies. Martin Bronfenbrenner has also found that in India a positive brideprice is more likely in polygynous castes. Not only does it seem that the probability of finding bridewealth versus dowry varies directly with the presence of polygyny, but evidence also suggests that bridewealth payments are higher the more polygynous the society. Comparing two Sebei communities in eastern Uganda, anthropologist Walter Goldschmidt (1974:316) found that the bridewealth was considerably higher in the more polygynous community. Encouraged by his findings among the Sebei, Goldschmidt then examined thirteen separate societies in East Africa and obtained a clear simple correlation between polygyny and bridewealth levels (p. 327).

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[3] For more on the economics of bridewealth and dowry, see Becker, 1977; Bronfenbrenner, 1971; and Grossbard, 1978b and 1978c.

In a given culture it is also to be expected that the more productive women will obtain higher bridewealth. Indeed, in India women with more education were found to command higher bridewealth or require a lower dowry (Shortledge, 1976).

Legal or customary protection: Marriage formality is one way by which women attempt to obtain guarantees for steady employment as wives, thereby justifying their specialization in particular household skills. There are other legal or customary ways for women to protect themselves against future loss of employment as wives, for instance the implementation of divorce laws whereby women are paid alimony. All these kinds of protection add to the total wife wage. In countries where households headed by females are very common and women have to raise their children without a husband's support, the average wife wage is probably low, or at least it is low among this group of women.

One word of caution should be given here: All these examples of wife wage indicators should be handled with care in cross-cultural analyses where changes occur simultaneously in a number of wife wage components. For instance, it is not clear whether the nineteenth-century Victorian lady was relatively more valuable than a contemporary Nigerian high school graduate. While high bridewealth is probably paid for the latter and the former had to bring a substantial dowry, the English woman had certain legal rights not available to the Nigerian and her work load in the home was lighter. This example of

an ambiguous welfare comparison raises the question of wife wage can be applied.

Potential Contributions of the Economics of Marriage

A fundamental advantage of the concept of wife wage lies in its measurability. The wife wage measures discussed here may be limited and ambiguous, but they do provide valuable information in an area where means of measurement are remarkably scarce. While the indicators mentioned above may not be used for comparing development among countries at a given point in time, they can be useful in measuring a country's progress over time and, most importantly, in comparing various subgroups in a population. Not only can women of different characteristics be compared, but some information about the relative welfare of women and men can be inferred. The question of whether the impact of poverty is more felt by women than men can be answered to some degree by studying marriage institutions and behavior. The lower wife earnings are in comparison to other earnings, the more poverty becomes specifically a woman's issue. However, much more research will have to be done to make the study of marriage a more accurate method of estimating poverty and welfare.

One of the major tasks of social science is to explain observed variations in behavior. In terms of work, these variations mainly consist in differences in earnings, productivity, and level of employment. In the previous sections, I have explored

the relationship of several factors to variations in conditions of work in the home, but there are many more causal relationships that have not been analyzed. Of particular interest from a development perspective are the effects of factors, like education, fertility, and labor force participation outside the home on wife wages versus wages in general, a study of which would show the impact of particular policies on various parts of the population. (For instance, a policy detrimental to married women may not necessarily cause harm to women in general; there may simply be a redistribution of welfare from married to unmarried women.) Not only could the economics of marriage help in designing development policies that give more consideration to possible benefit to married women, but eventually this type of analysis could also provide policy makers with ways of evaluating the profitabiliy of changes in marriage laws and customs (age at marriage, for instance).

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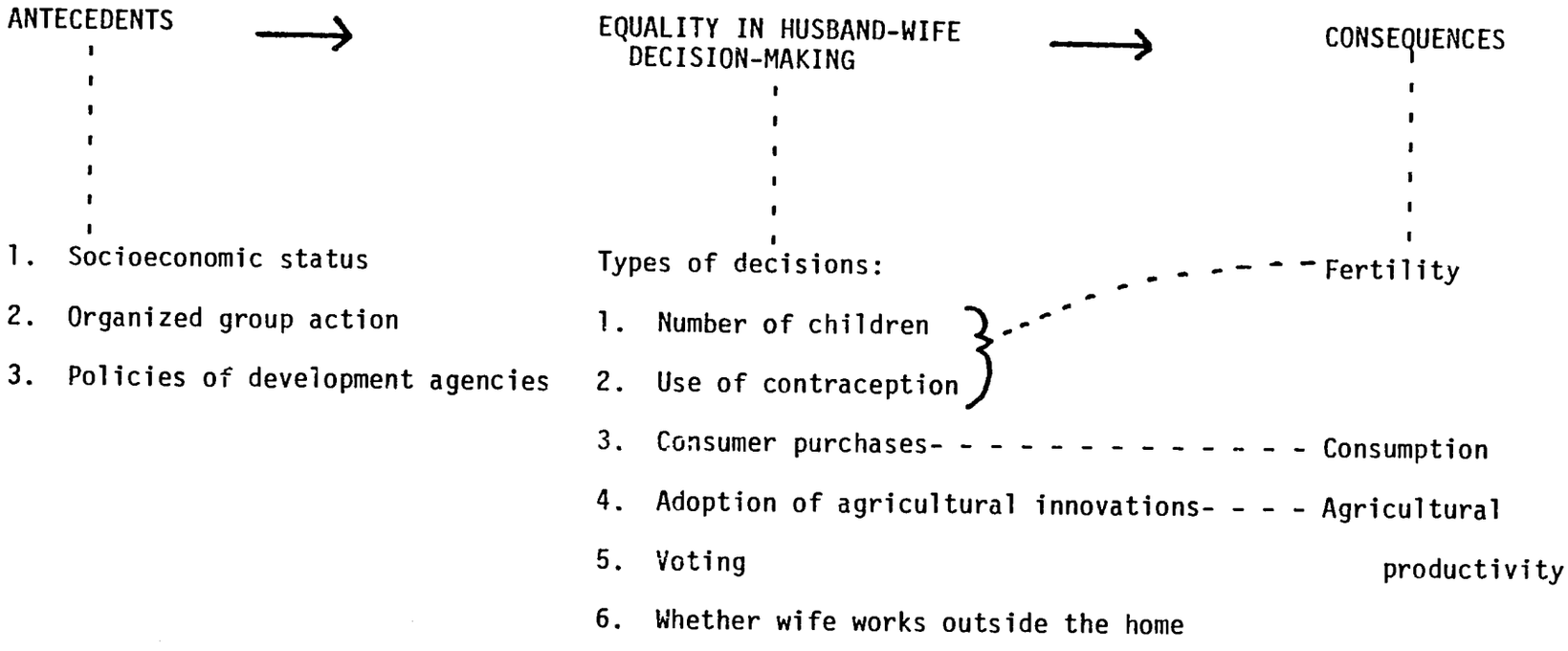
Who Decides: Equality in Husband-Wife Decisionmaking

Everett M. Rogers
Stanford University

Understanding the way in which husbands and wives in developing countries make decisions -- about family size, contraceptive methods, or agricultural methods -- is important as a prerequisite to development policy planning. Many development agencies assume that one or the other partner unilaterally makes a particular type of decision -- for example, that wives decide to adopt "female" contraceptives (like the IUD) and men decide to adopt vasectomy, that husbands (not wives) decide to adopt agricultural innovations, etc. Evidence reviewed later in this paper shows that in many cases such an assumption is not correct. The result is that development agencies 1) often direct their promotion activities to the wrong audience, and 2) may use inappropriate appeals in their messages (for example, economic arguments for smaller family size are generally more convincing to husbands, while health appeals for contraception are more effective with wives).

As figure 1 shows, the degree of equality between husbands and wives in decisionmaking is affected by many factors (such as socioeconomic status) and, has a number of consequences (level of fertility, agricultural productivity). The impact of such decisions goes beyond just the household to the country -- and the world. For that reason, equality in husband-wife decisionmaking may be an important policy variable for national and international development agencies, whose goals include increasing the degree of such equality as a means of involving both males and females in development programs.

Figure 1. Paradigm of Antecedents, Equality in Husband-Wife Decision-Making, and Consequences



This brief paper focuses on what is presently known about the way in which husbands and wives make decisions about family planning and rural development and the factors that affect how such decisions are made. The wider implications for development are shown in a discussion of Korean mothers' clubs, which began as a means of disseminating family planning information but have become centers for village development and for working toward female equality.

Family Planning

Among the various investigations on this topic, many have dealt with the nature of husband-wife decisionmaking about 1) the adoption of family planning, and 2) the desired number of children that parents want to have. These data often are obtained as one component of "KAP" (knowledge-attitude-practice) surveys of family planning, in which the research probes retrospectively into who decided about the adoption of family planning and about family size. Usually, the respondents in KAP surveys in developing nations are married women in their reproductive years. One of the first KAP surveys (Hill et al., 1959) found that husband-wife communication and joint decisionmaking about the use of contraception and about ideal family size were highly related to the adoption of family planning methods. Similar evidence has been provided by many KAP surveys since, including a recent survey in Korea, where Lee (1977, p. 101) found that husband-wife communication about family planning and ideal family size were two of the independent variables most highly correlated with the adoption of contraceptives. Similarly, Rogers and others (1978) found that husband-wife communication and decisionmaking about family planning and family size were the independent

variables most highly related to use of contraception among Mexican residents in a low-income California community.

Such results are hardly surprising, and may represent in part a kind of obvious interrelationship: a husband and wife may discuss family planning because they have been using a family planning method. Therefore it should not be concluded, or assumed, that husband-wife communication, or decisionmaking, about family planning causes or leads to its use. The reverse may also be the case. And it is certainly not too surprising that husband-wife equality in decisionmaking about family planning is related to use of family planning.

Further, there have been important methodological problems with measuring husband-wife decisionmaking in the KAP surveys. Often, the respondent (almost always the wife) is asked direct questions 1) about whether she and her husband have discussed family planning, and 2) about who decides. One might wish for data from both the husband and the wife about such matters, so that measures of agreement about these variables could be computed (Coombs and Fernandez, 1978).

Given these caveats, some general findings have emerged from KAP surveys. Although it has usually been assumed (implicitly) by national family planning officials that women make the decisions about such female methods as the IUD and pills, several recent researches show support for the generalization that husbands are more important than wives in decisions to adopt family planning methods, including such female methods as the IUD, pills, and tubectomy, even though most such innovation decisions are made jointly, rather than unilaterally. Husbands are

involved jointly or unilaterally in almost all family planning decisions; very few such decisions are made by the wife alone, even for "female" contraceptives. Clearly, husbands are a priority audience for attempts to promote "female" family planning methods, but they have been largely ignored in the past.

Research evidence for this generalization comes from studies such as the following:

1. Dubey and Choldin (1967) found that in only 7 per cent of 182 Indian families adopting the IUD was the decision made by the wife alone. Most of the remaining 93 per cent of the cases were joint decisions by husband and wife, with each partner being somewhat more dominant in half of the cases.

2. About 75 per cent of the women coming to clinics in Hong Kong for the first time had consulted their husbands about family planning (Lam, 1968, p. 82).

3. An investigation by Pilai (1971) in South India indicated that only 40 per cent of vasectomy adoption decisions were made by the man only, the remainder were made jointly with wives, kin, and others. Only 10 per cent of the tubectomy adoption decisions and 22 per cent of the IUD decisions were made by the wife alone; in most of the cases, the decision was made jointly, with the husband predominating.

4. On the basis of his investigation in South India, Balakrishna (1971, p. 2) stated: "In our male-dominant society, no programme of family planning can be a real success unless the men are also convinced of its need."

5. In the Philippines, Mercado (1971) found that only in a relatively few cases is the family planning decision made unilaterally by the wife. Most such decisions are made jointly by husband and wife, with the husband usually dominant.

6. Among Mexican-Americans in a low-income California community males were jointly involved with their female partners in decisions to adopt the pill or IUD (Rogers et al., 1978).

Men are generally more opposed to family planning than women because they want more children. In other words, husbands are not as likely to accept the small family norm. Data are available from twelve KAP studies in developing countries in which comparable samples of men and women were asked if they wanted more children (Rogers, 1973). For eleven of the twelve KAP samples, more women than men did not want any more children. Often the difference was considerable; for instance, a KAP survey in Jakarta found that 42 per cent of the females, but only 27 per cent of the males, did not want more children.

It is a dangerous oversimplification to expect that females make innovation decisions just because the IUD, pills, and tubectomy are "female" methods. The individual in a family who decides is not necessarily the same individual who uses the innovation, so family planning programs should recognize that most innovation decisions are made jointly, and that the male audience may be important. Therefore family planning programs should adopt the following strategies:

1. The economic advantages of family planning should be emphasized for the male audience, rather than the health advantages, which are

usually stressed for the female audience.

2. Male field workers should be used to contact husbands, particularly in cultures where there are certain taboo subjects that men and women do not disucss with each other. Similarly, male clinics and male contraceptives (like the condom and vasectomy) should receive their due.

3. Family planning messages should be designed to encourage husband-wife communication and decisionmaking. An example is the pamphlet given to Taiwanese women, which includes a section to be shown to their husbands that stresses the economic benefits of family planning.

4. Policies that go beyond family planning, such as tax breaks and retirement benefits, and that especially appeal to men might be considered as possible means of overcoming male resistance to family planning.

Rural Development

Although much less numerous than the KAP surveys of family planning, some investigations have been completed on husband-wife decisionmaking in rural development. After an analysis of factors related to the success of rural development projects in Africa, Morss et al. (1976, p. 75) concluded: "Women have played and are playing a far more significant role in the rural production sector than has been recognized heretofore." In fact, this research showed that behavior change on the part of women occurred more rapidly through a farm-production approach (by development agencies) than through home-care approaches.

In the past, it has often been assumed by program officials (and by some social researchers) that women were largely irrelevant to rural development. Recently, we have begun to overcome this assumption, which is false in many cultures. Wives may be involved in joint decisions with their husbands about agricultural innovations (although this topic has been little studied to date), and may be important in collective decisions about development alternatives at the village level, as they are, for instance, in the Peoples' Republic of China, the Republic of Korea, and Indonesia.

It has been shown that some type of local group at the village level is an essential for effective rural development. This small group may be a farmers' credit cooperative (the Comilla project in Bangladesh and the Puebla Project in Mexico), a "study group" (China), a "radiophonics school" (Colombia and elsewhere in Latin America), a radio-listening group (Tanzania), a "banjar" (Bali), or a mothers' club (Korea). We know from prior research in social psychology that such small groups are an ideal means for changing individuals' attitudes and behavior, especially if there is a channel by which new ideas can come into the group from external sources. (In fact, if such information inputs do not regularly come to the group, it may soon lose energy and lapse into inactivity.)

Mothers' clubs are of great interest to development planners, who in very recent years have begun to pay more attention to how the benefits of development programs are distributed in society. They now stress the need for greater participation in development activities, of both

the poor and women,[1] especially in rural areas of developing nations. These weaker sections of society are now regarded as the priority audience for development agencies. This focus on a more equal distribution of the socioeconomic benefits of development is illustrative of an intellectual shift in the definition of development. The newer conceptions of development imply that it is a widely participatory process of social change in a society, intended to bring about both social and material advancement (including greater equality, freedom, and other valued qualities) for the majority of the people as they gain greater control over their environment.

The conventional wisdom to date suggests that women are more likely to organize and participate in such development groups than are men, at least when they are not culturally proscribed from doing so. The lower status accorded females in many nations may be a force that encourages women to join in small groups for mutual self-interest. That the organization of such groups can lead to increased rural development, as well as greater equality for women, is shown by the Korean mothers' clubs.

Mothers' Clubs in Korea: Group Action for Equality

Mothers' clubs are village-level organizations originally established in 1968 to encourage family planning practice among married women of reproductive age and to serve as a channel for family planning

[1] The role of improving the status of females in leading to greater socioeconomic development is recognized by Senator Percy's amendment to the Mutual Assistance Act Public Law 93-189 of December 17, 1973: "[The U.S. AID program] shall be administered so as to give particular attention to those programs, projects, and activities which tend to integrate women into the national economies of foreign countries, thus improving their status and assisting the total development effort."

information and supplies.[2] The typical club has about twenty members. Mothers' clubs are one of the most distinctive aspects of the Korean family planning program, which is considered to be one of the programs that has been relatively successful in reducing fertility (Rogers, 1973). Korea is the only nation in the world in which so much effort has been given to organizing small groups of women as a means of promoting the community-level diffusion of family planning methods.

Mothers' clubs in Korea are of particular importance, not only because of their success in encouraging women to adopt family planning methods, but also because of their role in initiating a variety of local development projects. (For instance, the mothers' club in Oryu Li Village purchased the men's drinking place, and converted it into a cooperative grocery store.)

Since 1970, President Park Chung Hee has enthusiastically advocated an integrated rural development approach in Korea, called the New Village Movement, which is aimed at creating greater rural-urban equality through local self-development efforts in villages. Mothers' clubs play an important role in these village-level activities, and are today being given special emphasis in the New Village Movement. In 1978, 27,300 mothers' clubs had 749,700 members.

In addition to facilitating family planning and rural development, the Korean mothers' clubs also encourage female equality.

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[2] Throughout the present paper we follow the usual convention by referring to these groups as "mothers' clubs," while acknowledging that the Korean terminology, omoni whoa, might be more literally translated as "mothers' gathering." Many mothers' clubs in Korean villages existed as kaes (informal savings associations) prior to becoming formalized as mothers' clubs in 1968.

Women have been traditionally excluded from participation in village development councils in Korea. However, a recent survey[3] shows that since 1970, about one third of such councils have admitted at least one female member (there are an average of nine members on a village council), although such female leaders often play a very passive role at the council meetings, and seldom initiate action leading to group decisions. (One exception is the leader of the council is a woman, an unheard-of-event in the past.) More generally, through their various group activities, the mothers' club members gain a feeling of personal efficacy, the belief that they can control the events in their lives. Through the adoption of family planning, village women gain control over their own bodies. The family planning movement and the female emancipation movement in Korea, as in many other nations, are closely linked. This is quite understandable, given the aims of both movements.

The female equality movement in developing nations is expected to contribute to reduce fertility because it will expose women to alternative and/or supplementary roles to motherhood as a means for self-fulfillment. The movement seeks to legitimize such roles socially and culturally. As women's contributions to socioeconomic development are increasingly recognized and valued, support from the male sector of society is expected to increase, thus also encouraging lowered fertility.

It should be noted, however, that it has taken some time for Korean men to accept the idea that women should be involved in activities outside the home or should have a voice in decisions (Rogers and Kincaid, 1979). Traditionally,

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[3] This investigation was conducted by Dr. D. Lawrence Kincaid and several colleagues in the East-West Communication Institute, and the School of Public Health at Seoul National University.

the most important function of the Korean family was perpetuation of the family line from father through the first-born son. The appropriate role of the female was thought to be an early marriage and the procreation of sons. Bearing only daughters was considered almost as unfortunate as having no children at all. So the traditional female role was one of subordination, first to her father, then to her husband, and finally to her eldest son.

The Korean word for woman literally means "inside person," suggesting that Korean women are largely forbidden to participate in community organizations outside their home. Village chiefs, village councils, and other organizations were always all-male. So one can imagine that when a mothers' club was first launched in a Korean village, it was likely to encounter considerable resistence. In one of the villages studied, for example, when a family planning field worker first appeared, she was spanked by a village elder for talking to the women about contraception. The husbands in this village strongly resisted organization of the mothers' club. Several cited the traditional folk-saying that "misfortune will fall upon any house in which the hen crows like the rooster."

This initial opposition by men, especially village elders, to mothers' clubs was encountered in many villages. But as mothers' clubs gained momentum and power through their financial accomplishments and their contributions to village development, this initial opposition was overcome. In some villages, in fact, local men display considerable

pride in their wives' achievements. Husbands have begun to realize that their wives constitute a formidable force for their villages' development. Through their own accomplishments, mothers' clubs earn the respect of the members' husbands, and thus are gradually beginning to change the status of women.

As the Korean clubs show, one of the social mechanisms for achieving greater equality for women is organized group action. Such efforts offer one possible means of changing existing patterns of husband-wife decisionmaking, by gradually encouraging self-development. In Korea, at least, increased female equality could not have occurred without the organization of mothers' clubs.

Local groups at the village level provide a means for raising levels of social consciousness; they offer a mechanism for group action and reinforcement of behavior change and for increasing personal efficacy. They can encourage altruistic behavior for rural development.

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The Allocation of Familial Labor and the Formation of Peasant Household Income in the Peruvian Sierra

Carmen Diana Deere
University of Massachusetts, Amherst

This paper addresses the question of rural women's contribution to peasant household income. The central proposition of the paper is that the allocation of labor within the peasant household is determined by a complex interaction of class and family structure variables, as well as by the social valuation of male and female activities. Peasant women's contribution to the formation of household income is affected by the household's access to the means of production and by the age and sex composition of the peasant household, as well as by the form of incorporation of the peasant household into the wider economy, i.e., the degree to which the household is involved in the labor market or commodity market.

In contrast to the firm or household in advanced capitalist economies, the peasant household is a unit of production of both commodities and use values. The production of use values is defined in terms of those useful activities which are carried out in the household to meet the family's subsistence consumption requirements. Included are those activities which reproduce the capacity for work on a daily basis (cooking, cleaning, washing clothes, gathering wood and hauling water), activities required to reproduce labor power generationally (childcare and nurturing) and direct production (agriculture, animal raising, etc.) for the family's consumption. The

production of exchange values is defined in terms of the production of commodities: the production of goods and services, embodying familial labor time, which are socially valued in the market and yield a monetary income to the producer. A distinct feature of the labor process within the peasant household is that many familial activities both yield use values to the peasant household and are a source of exchange value; agricultural production and processing, animal care, and artisan production are examples of petty commodity production that, depending on the degree of specialization in production, may also provide use values for the peasant family.[1]

Conceptually, the peasant household may be viewed as starting with a given stock of resources and a given composition, by sex and age, of the familial labor force. Familial labor is allocated to a range of activities that are required to reproduce the peasant household's level of subsistence consumption and, possibly, to generate a surplus. The surplus, depending on the form of integration of the household into the wider economy (the social relations of production), may be either appropriated by a nonproducing class or captured within the peasant household, permitting an increased level of subsistence consumption or the possibility for accumulation of means of production. This dynamic process of the appropriation

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[1] This paper uses the concepts of "use value" and "exchange value" production rather than the more standard terms "home production" and "market production," because the former allow us to emphasize the degree of integration of the household into the commodity market and hence into the capitalist economy. The concept of market production as used by most economists includes production for subsistence consumption as well as for market exchange. Since a key proposition of the paper is that the degree to which the peasant household interacts with the wider economy is crucial in determining the division of labor by sex, as well as women's contribution to household income, the distinction is critical.

and distribution of the surplus forms the basis for the social differentiation of the peasantry over time.[2]

Access to the means of production--principally land--is key to the process of social differentiation, as well as to the determination of the range of activities in which peasant households participate. Rather than conceptualizing the peasantry as a homogeneous whole, I view the peasantry as divided into different class groupings, related to their access to the means of production. Lack of access to the means of production requires the poorer strata of the peasantry to depend on nonagricultural activities to earn its livelihood, principally the sale of labor power for a wage. With the integration of the peasantry into the labor market, the household becomes less a unit of direct production and becomes increasingly geared to only the daily and generational reproduction of labor power. The extreme of this process is represented by the domestic unit of the working-class family in advanced capitalism.

Access to sufficient resources allows other elements of the peasantry to engage in petty commodity production, sometimes specializing in agricultural or animal-raising activities, or in artisan production. Access to sufficient means of production also allows the richer peasantry to purchase wage labor to carry out their productive activities, thereby providing the means for increased capital accumulation. The extreme of this process is represented by the capitalist agricultural farm or the small factory. Here, too, the unit of production is divorced from the household of the owners of capital.

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[2] This methodology is developed in Carmen Diana Deere and Alain de Janvry, "A Conceptual Framework for the Empirical Analysis of Peasants," University of California, Berkeley, December 1978. Mimeo.

A key premise of this paper is that this process--the constitution or decomposition of the peasant household as a unit of direct production as well as of reproduction--has singularly important implications for the economic and social role of different groups of rural women. The class position of the peasant household may influence attitudes about which activities are proper for women. Economic necessity, on the other hand, may result in the breakdown of sex roles--poor peasant women may pursue activities not deemed appropriate for rich peasant women. The possibility for capital accumulation in the rich peasant stratum may also open up a new set of activities (commerce, for example) to women of this class. activities that are not available to the majority of poor women. Finally, the differential opportunity costs by sex in the labor market may influence the household division of labor by sex in varying manners by class.

In sum, the peasant household--and the intrafamilial deployment of labor--cannot be analyzed in isolation from the process of integration of the household into the dominant capitalist mode of production. The familial division of labor by sex is at once conditioned by the degree of integration of the peasant household into the labor market or the product market and by the social valuation of men's and women's work.

While a comprehensive analysis of familial labor deployment among the peasantry is necessarily complex, the objectives of this paper are more limited.[3] I wish to determine women's contribution

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[3] A more complete analysis of familial labor deployment would have to take into account family structure and composition over the family life cycle. Over the family life cycle, the age and sex composition of the household changes significantly, so that the division of labor by sex and age within the household would also be expected to vary. Family structure and composition is also key in determining the range of activities in which a given household may participate at a given point in time.

to household income by analyzing the division of labor by sex within the household in use-value and exchange-value-producing activities. The first section of the paper provides a brief summary of the historical background of the peasantry on which this study focuses. In the second section, the allocation of family labor among use-value and exchange-value production activities is described. The concluding section summarizes the data on household income formation and the sexual division of labor in terms of women's contribution to household income and of the differential returns to female and male labor.

The data presented in the paper were derived from two sample surveys representative of the peasantry's access to land. The 1973 Cajamarca Income Survey provides data on income sources for 1,050 households in nine districts of the province of Cajamarca. The 1976 Peasant Family Survey of 105 households is a follow-up survey, focusing on the division of labor by sex and age. The quantitative data is complemented by family case study data gathered by the author during fifteen months of field work in the area.[4]

Socioeconomic Characteristics of the Cajamarcan Peasantry

The Cajamarcan peasantry is a mestizo, Spanish-speaking peasantry living in the northermost sierra department of Peru. In this area the traditional hacienda system was dominant up until the mid-1950s. The

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[4] The 1973 Cajamarca Income Survey was carried out under the direction of Ing. Efrain Franco of the Projecto Cajamarca-La Libertad, Programa de Estudios Socio-Economicos. The 1976 Peasant Family Survey was representative of the population defined by the 1973 sample. This survey was carried out by the author in June-August, 1976.

expansion of the haciendas during the colonial period, and particularly in the nineteenth century, resulted in the decimation of the indigenous communities. Throughout the first half of this century, the haciendas held a virtual monopoly over the cultivable lands. The majority of peasants gained access to land through a variety of rental arrangements, characterized by the provision of labor services to the landlord and/or the payment of rent in kind and cash.

The development of the internal Peruvian economy in the 1940s and 1950s, due, first, to the effects of export-led growth, then, to the process of import-substitution industrialization, provided the impetus for the dissolution of the hacienda system and for the development of the market in land as well as labor. Central to this process was the establishment of a milk processing plant in the Cajamarcan Valley by the multinational corporation, Nestlé. The advent of a local market for milk was key in converting this area from grain production to pasture production for the nascent dairy industry and in fostering the development of agrarian capitalism.

In approximately ten years, the haciendas were transformed into modern dairy enterprises, which used advanced techniques of production and a fully proletarianized, but reduced, labor force. The mass of the peasantry dependent on the hacienda system was either completely displaced or relocated to the least productive lands of the hacienda. With the development of the land market, as the landlords attempted to capitalize the productive core of the hacienda-turned-dairy enterprise, as well as to rid themselves of obligations, many peasants were able to purchase their land parcels. The outcome of the process of capitalist development was to create a sector of modern agrarian firms on the one hand, and a large sector of independent peasant producers, on the other.

Within the peasantry, the process of capitalist development accelerated the process of social differentiation. A class of fully proletarianized peasants resulted among those who no longer had access to land to farm and who therefore either found employment on the dairy farms or migrated to the coast in search of work. A rich peasant strata also emerged with sufficient resources to capitalize the production process to become dairy as well as agricultural commodity producers. The majority of the peasantry became semi-proletarianized (dependent on both agricultural production and wage labor for a living).

By 1972, 71 per cent of the peasant households in the province of Cajamarca were smallholders, owning less than 3.5 hectares of land (which is officially defined as the minimum needed to maintain the average peasant household). Some 19 per cent of peasant households could be considered middle peasants, with access to between 3.51 and 11 hectares of land. The rich peasant stratum, representing 8 per cent of the total number of households, held between 11.01 and 30 hectares of land; while those owning over 30 hectares, 2 per cent of rural households, represented the rural petty bourgeoisie.[5]

The process of social differentiation becomes apparent when the fact is taken into account that some 60 per cent of the smallholder households participate in the labor market, whereas the majority of households among the rich peasant stratum and petty bourgeoisie rely on the use of wage labor for their productive activities. Table 1 highlights the process of the peasantry's integration into the labor market, as opposed to the product market, in terms of the composition of net household income by

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[5] Catastro Rural, Ministerio de Agricultura, Zona Agraria 11, Cajamarca.

Table 1. Composition of Mean Net Income By Importance of Source and Land-size Strata (in percentages)

LAND SIZE STRATA	Agric. Production	Agric. Processing	All Animal Activities	Rental Income	Sub-total: All Farm Activities	Artisan Income	Wage Income	Commerce Income	Remittance Income	Total Net Income
Near-Landless Households (n=140)	1.0	0.1	18.8	0.4	20.3	9.2	55.5	10.3	4.7	100.0%
Smallholder Households (n=619)	10.2	0.2	10.0	0.4	24.0	7.1	48.6	12.5	7.5	100.0%
Middle Peasant Household (n=177)	19.6	0.1	27.0	8.7	55.4	4.1	23.5	10.4	6.6	100.0%
Rich Peasant Household (n=81)	42.0	0.2	24.4	15.4	82.0	2.1	11.4	3.6	0.9	100.0%
Petty Bourgeois Households (n=33)	26.1	0.1	62.1	1.3	89.6	0.7	5.7	3.3	0.7	100.0%
Total (n=1050)	17.6	0.2	23.6	5.4	46.7	5.2	33.8	9.2	5.0	100.0%

SOURCE: Derived from 1973 Cajamarca Income Survey.

land-size strata. In order to illustrate the importance of access to land, the smallholder strata has been broken into two groups: those households with less than 0.25 hectares of land (denoted as "near-landless" households), and those with 0.26 - 3.50 hectares (referred to as "smallholders").

The relationship between farm income, as a proportion of total net income, and land-size strata is clear. Whereas over half of the net income of middle and rich peasant households is derived from farm activities, less than a quarter of the total net income of near-landless and smallholder households is derived from farm production activities. The majority of the peasantry, because of insufficient access to the means of production, cannot live from farm activities alone. The single most important source of income for near-landless and smallholders households is wage work, which illustrates that the peasant household's access to the means of production is key in determining the range of activities in which the family participates, as well as in determining the importance of the activity in generating household income.

Allocation of Labor

This section considers the relationship between the division of labor by sex and age and the generation of use values and exchange values within the peasant household. Table 2 presents the matrix of participation in the principal activities of the peasant household, aggregated according to the family member charged with the primary responsibility for directing and carrying out the activity. The disaggregated data on the principal and complementary person responsible

Table 2. Familial Activities According to the Principal Family Member Responsible for the Activity, Frequency Distribution (percentages)

Activity	Mother's Principal Responsibility	Father's Principal Responsibility	Children's Principal Responsibility	All Family Members Responsibility[a]	To
Use Value Production					
Cooking (n=105)[b]	93.4	—	2.8	3.8	1C
Washing Clothes (n=105)	93.3	—	4.8	1.9	1C
Hauling Water (n=105)	78.3	1.8	10.3	9.6	10
Collecting Wood (n=105)	58.1	16.2	9.5	16.2	10
Use and Exchange Value Production					
Ag Processing (n=105)	93.4	—	1.9	4.7	1C
Animal Care (n=92)	61.9	4.4	22.9	10.8	10
Ag Work (n=102)	5.7	64.5	7.6	22.2	10
Artisan Production (n=101)	66.7	18.4	11.5	3.4	1C
Commerce (n=28)	85.7	10.7	—	3.6	10
Part-Time Wage Work (n=51)	9.8	47.1	17.7	25.5	10
Full-Time Wage Work (n=23)	13.0	43.5	30.4	13.0	10

[a] The category All Family Members includes cases where mother and father share responsibility for the activity, where other family members carry out the activity, and where parents and children carry out the activity with equal responsibility.

[b] The number of households participating in the activity.

Source: 1976 Peasant Family Survey.

for carrying out the activity as well as the data pertaining to the differences in time use and to familial participation by land-size strata is presented in table 3.

The Production of Use Values

The production of use values for the maintenance of familial labor power on a daily basis is a female activity, and it is the responsibility of the mother in the overwhelming majority of households. In half of the households, mothers take full responsibility for cooking and washing clothes, although in one third of the households, mothers and daughters share the responsibility for these activities (table 3). Up until the age of nine or ten, daughters complement the mother's labor; after that, young girls begin substituting for their mothers on a meal-by-meal basis, and by their mid-teenage years may replace the mother in cooking activities, freeing her completely for other kinds of work.

Meal preparation and the washing of clothes are the most time-intensive maintenance activities. The average household of 5.5 members dedicates a total of 4.2 hours of labor time daily to cooking and to cleaning up after the meal.[6] Laundry is generally a weekly activity, consuming an average of 6 hours of labor time per week.

The two activities that are most generally shared among all family members are hauling water and collecting wood. Nevertheless,

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[6] Housecleaning was not considered a separate household task, for in the majority of households it is carried out in conjunction with meal preparation and clean-up. The meal is usually served on a tablecloth on the ground in the lean-to kitchen or on the front porch of the one-room house, so the floor is generally swept and belongings picked up before the major meal of the day. Extensive food preparation usually goes into just one meal, served sometime between two and five o'clock, depending on the family's activities that day. This meal will involve the preparation of a soup or porridge which is then re-heated in the evening or early morning.

Table 3. Familial Activities According to the Principal and Complementary Person Responsible for the Activity, Frequency Distribution, All Peasant Households (percentages)

	Mother's Principal Responsibility				Father's Principal Responsibility				Children's Principal Responsibility			All Family Members Principal Responsibility			
	Mother	Mother and Daughters	Mother and Sons	Mother and Children	Father	Father and Daughters	Father and Sons	Father and Children	Daughters	Sons	Children	All Family Members	Mother and Father	Other Family Members	Total
Cooking (n = 105)	57.5	34.0	1.9	-	-	-	-	-	2.8	-	-	-	1.9	1.9	100%
Washing Clothes (n = 105)	59.9	32.4	1.0	-	-	-	-	-	3.8	-	1.0	-	-	1.9	100%
Hauling Water (n = 105)	35.9	24.5	2.8	15.1	.9	-	.9	-	4.7	.9	4.7	3.8	3.8	1.9	100%
Collecting Wood (n = 105)	32.4	14.3	1.9	9.5	8.6	-	5.7	1.9	3.8	1.9	3.8	9.5	4.8	1.9	100%
Ag Processing (n = 105)	67.6	23.8	1.0	1.0	-	-	-	-	1.9	-	-	2.9	1.0	1.0	100%
Animal Care (n = 92)	25.0	14.1	5.4	17.4	3.3	1.1	-	-	10.9	2.2	9.8	8.7	1.1	1.1	100%
Ag Work (n = 102)	3.9	.9	.9	-	42.2	1.8	6.7	13.7	.9	4.9	1.8	7.7	11.8	2.7	100%
Commerce (n = 77)	57.1	2.6	-	-	18.2	-	3.9	-	1.3%	-	-	3.9	12.99	-	100%
Artisan Production (n = 101)	53.1	13.6	-	-	14.3	-	3.4	0.7	7.5	2.0	2.0	0.7	-	2.7%	100%
Part-time Wage Work (n = 51)	7.8	-	2.0	-	27.5	3.9	15.7	-	-	15.7	2.0	-	25.5	-	100%
Full-time Wage Work (n = 23)	8.7	4.3	-	-	34.8	-	8.7	-	4.3	26.1	-	-	4.3	8.7	100%

Source: 1976 Peasant Family Survey.

these tasks are the responsibility of the mother in the majority of households. The participation of children of all ages in carrying out these tasks is key. Daughters, however, are much more likely to participate in these tasks on a regular basis than are sons (see table 3).

The time-intensiveness of these tasks depends on the household's proximity to the primary resources. The variation is of course great, but, on the average, household members spend approximately 30 minutes a day making four or five trips to the stream or spring.[7] Wood-gathering activities take an average of 5 hours weekly, with branches, dried cactus leaves, and brush generally collected on a daily basis. In 16 per cent of the households, wood collection is the father's responsibility; these households are generally located in quite populated areas, so that wood collection involves a weekly trip to more distant areas to chop down a tree. Firewood is becoming increasingly scarce in the area, and 16 per cent of the households purchase wood from traders to complement their own gathering activities, while 10 per cent of the households, primarily those located near the city of Cajamarca, rely exclusively on purchased wood or kerosene.

For the sample as a whole, household maintenance activities take up a total of 44 hours of familial labor time per week.[8] There is

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[7] Only 7 per cent of the households were located near a potable water source; all of these households were in the rural areas surrounding the city of Cajamarca, the capital of the department.

[8] The time that might be dedicated explicitly to childcare has not been taken into account in this calculation. Most respondents considered childcare an activity complementary to their work in the household or in the fields, not a separate activity. Nevertheless, this underestimates the total amount of time dedicated to such activity, since children, particularly daughters, are charged with looking after younger brothers or sisters.

little variation by family size; in larger families, more children spend a shorter amount of time on each activity, freeing the mother for other work. In extended families, a grandmother may take charge of all daily maintenance activities, again freeing the mother for income-generating activities. The time dedicated to household maintenance activities does not significantly vary by land-size strata (see table 4). Across all strata of the peasantry, such activities fall into the female domain. In most households, mothers carry the largest burden for household maintenance, although the participation of children, particularly daughters, is most important.

The Production of Use and Exchange Values

Petty commodity production activities that also generate use values for the peasant household include agricultural production, agricultural processing and product transformation, animal raising, and artisan production. The whole family takes part in these activities, although the direction of a specific activity falls in either the male or female domain. Men are considered the agriculturalists and women the animal raisers. Nevertheless, there are important differences among the different strata of the peasantry in men's and women's participation in the myriad of tasks which make up the activity. There are also important differences in who controls the marketing and the income from the activity; these differences are closely related to the scale of the activity.

Table 4. Average Time Dedicated By All Family Members to Familial Activities by Land-Size Strata[a]

Activity	Landless Households	Smallholder Households	Middle Peasant Households	Rich Peasant Households	All Households
Household Maintenance[b] Hrs./Week (n = 100)	44.1	43.6	44.6	44.2	43.9 hours
Animal Care Hrs./Week (n = 83)	31.6	35.6	42.3	46.7	37.8 hours
Ag Processing Days/Year (n = 87)	17.2	13.6	21.2	20.2	16.0 days
Marketing Own Products Days/Year (n = 38)	-	37.4	16.5	35.3	33.9 days
Artisan Exch. Values[c] Days/Year (n = 23)	192.0	177.7	30.0	52.0	164.4 days
Commerce[d] Days/Year (n = 28)	225.0	129.0	200.0	-	162.0 days
Wage Work[e] Days/Year (n = 58)	224.9	153.6	58.8	-	149.9 days
Ag Production Months/Year (n = 57)	1.2	4.0	10.5	7.9	5.3 months

[a] The time use data is based on recall of average time dedicated to the activity over the specified time period.

[b] Household maintenance activities include cooking, washing clothes, hauling water and collecting wood.

Table 4 -- continued

[c] Time Use data refers to only those households where artisan production was an income generating activity. A total of 101 households participated in artisan production and in 77 households artisan production was a use value activity, principally consisting of women spinning wool for household requirements. Since this activity is complementary to women's work in animal care, child care and leisure, time use not consistently reported.

[d] Commerce includes only petty commodity circulation (trading as a profession and country stores).

[e] Wage work includes both part-time and full-time wage work.

Source: 1976 Peasant Family Survey.

As table 2 indicates, fathers take the primary responsibility for agricultural activities in 65 per cent of the households. Mothers direct agricultural activities only in the households where no grown male is present (6 per cent); if a teen-age son is living at home, he will generally direct the agricultural activities (8 per cent). Since the households headed by women are concentrated in the landless and smallholder strata, only in these strata do women direct agricultural production at all (see Appendix A, tables 1 and 2). The households in which it is considered that all family members share equally in taking responsibility for agricultural activities (22 per cent) also are concentrated primarily among the landless and smallholder strata.

A detailed accounting of the division of labor by sex in the myriad of tasks which agricultural production encompasses over the annual cycle reveals the importance of women's participation in agricultural production. Women provide 25 per cent of the total number of family labor days dedicated to agricultural production. There are, however, significant differences by land-size strata, not only in women's relative participation as compared to men's, but in the tasks in which women of different strata participate. Whereas women from the middle and rich peasantry provide only 21 per cent of the total family labor days dedicated to agricultural activities, women from the landless strata provide 35 per cent of the total. [9] Women from the upper strata

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[9] Carmen Diana Deere, "The Agricultural Division of Labor by Sex: Myths, Facts and Contradictions in the Northern Peruvian Sierra," paper presented to the panel on Women: the New Marginals in the Development Process? Joint meetings of the Latin American Studies Association and the African Studies Association, Houston, November 1977.

confine their participation to what generally are considered female activities (placing the seed in its furrow or sweeping up the threshed grain) or to those tasks which do not involve the use of implements (harvesting or weeding by hand). Women from the poorer strata tend to participate in all agricultural tasks, with the exception of plowing.

The differences in the actual tasks in which women from different strata participate, as well as the differences among strata in women's use of implements, suggests the important role of economic necessity in breaking down the traditional definitions of "appropriate" work for women. Moreover, women's greater relative participation in agricultural field work is correlated with women's greater participation in agricultural decisionmaking.[10] In the majority of landless households, women take responsibility for the provision of agricultural inputs as well as for product disposition; the actual organization of work is carried out by both men and women. Among smallholder households, all facets of agricultural decisionmaking tend to be shared between men and women. In contrast, among middle and rich peasant households, agricultural decisionmaking falls in the male domain. The differences in agricultural participation and decisionmaking among the different strata of the peasantry suggests that only where agriculture is an important source of livelihood is it a male occupation. For the majority of peasant households, the importance of agricultural production in terms of household income is declining; as its importance

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[10] Ibid.

diminishes, women's participation and responsibility for the activity correspondingly increases. The small amount of time which is dedicated to agricultural production by the poorer strata of the peasantry should also be noted. Landless households reported spending approximately one month a year, while smallholder households estimated a maximum of four months yearly dedicated to agricultural activities.[11] For middle and rich peasant households, agricultural activities were reported as requiring from seven to ten months annually (see table 4).

Only 10 per cent of the households in the sample considered agricultural production to be an income-generating activity; the vast majority of these were middle and rich peasant households. Agricultural commodities comprised only 8 per cent of the farm-generated monetary income of landless and smallholder households in 1973; in contrast, agricultural sales represented 43 per cent of the farm-generated monetary income of middle and rich peasant households (see table 1).

In the overwhelming majority of poor peasant households, women are responsible for the marketing of produce; this is usually done on an extremely small scale, the woman taking a small sack of grain or 25 pounds of potatoes to sell at the weekly market. The income generated is then used to purchase the weekly necessities. In contrast, among rich peasant families the bulk of the marketing is carried out

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[11] The actual accounting of days worked in agricultural production in the 1976 agricultural year revealed that near-landless households spend 20 labor-days a year in agricultural production, while smallholder households spend fewer than 60 labor-days. Ibid.

at the wholesale level, and primarily by males. An average of 34 days a year are dedicated to marketing activities across all strata.

Since the bulk of agricultural production among poor peasant households is destined for home consumption, agricultural processing and product transformation activities constitute the use-value production which is most time-intensive. In the majority of households, this again is the responsibility of the mother, and is carried out by the female members of the household. Agricultural processing tasks are carried out on a daily, weekly, monthly, and annual basis, depending on the scale of production and the form of storage of the crop. For example, grain processing first involves sorting and cleaning the grain, usually following the harvest. The grain may then be toasted weekly, and ground between stones as required for daily consumption. Among more prosperous households, the grain is taken to a mill, usually on a monthly basis, which then requires that several days be dedicated to toasting prior to the trip to town. If the wheat or barley grain is processed into flour at home, the complete preparation of a 25-pound sack takes approximately two days. Other processing activities include making dried potatoes after the harvest and quinoa (pigweed, used ground as cereal) preparation, all labor-intensive tasks.

Product transformation includes the preparation of bread, chicha (a corn liquor), and cheeses. In contrast to grain processing, which all households engage in, only 38 per cent of the households are involved in product transformation.

Nine per cent of the households reported engaging in product transformation as an income-generating activity, primarily weekly chicha-making. For the sample as a whole, 16 days a year were dedicated, on average, exclusively to agricultural product transformation or processing by women, primarily mothers or mothers aided by their daughters (table 3). The amount of time given to these activities appears responsive to the scale of agricultural production and to land-size strata (table 4).

Animal-raising activities are the mother's responsibility in 62 per cent of all households. The participation of children in this activity is key; in 22 per cent of the households children take full responsibility for animal raising, and in another 37 per cent, children are actively involved in animal raising. In contrast to agricultural work, where women participate actively in tasks which generally are the men's responsibility, the participation of men in animal raising is minimal. Fathers participate in animal care in only 17 per cent of the households and are the principal adult responsible for the activity in only 4 per cent of the households--all of which are dairy farms.

The care of the household animals takes an average of 30 minutes to an hour daily for most households. Grasses and weeds must be collected from the fields to feed the guinea pigs and rabbits; the chickens must be fed their grain husks or corn kernels, and the pigs, the slop. The larger farm animals are generally tied up near

the house, and fodder and water are brought to them several times a day. A household with dairy cattle usually has an enclosed pasture in which the animals are kept.

The most time-consuming animal-raising activity is the pasturing of sheep and goats. Since pasture, particularly open grazing land, is scarce, raising sheep requires that one family member be available practically full-time for this activity. As many women put it, raising sheep depends on having a child at home, either to pasture the animals, or to replace the mother in daily maintenance activities. Many women lamented the impact of primary schools: sending children to school is an economic hardship,not only in terms of the cost of school supplies, but also because it affects children's participation in income-generating activities in the household. And it is usually the mother that bears the increased workload of having children in school. Although children of both sexes are now attending school, there is a notable tendency for girls to attend for fewer years than boys. Not surprisingly, in 11 per cent of the households, a daughter raised sheep full time, whereas in only 2 per cent did sons (table 3).

Animal care is the second most time-intensive activity after general household maintenance. An average of 38 hours a week are dedicated to all animal-care activities. The time spent on this activity closely correlates with both the land-size strata and the number of people in the household. Whereas landless households

spend an average of 32 hours a week on animal care, middle households spend 42 hours, and rich households 47 hours a week (table 4). Richer peasants have greater access to land and therefore have larger herds of sheep; they also tend to have larger households, based on the extended family, so that one family member is available for full-time animal care. Landless peasants, on the other hand, tend to confine their animal-raising activities to those--which do not require much land or much time.

The 1976 Peasant Family Survey shows that, as in the case of agricultural production, animal raising is considered an income-generating activity by only 10 per cent of the households, the majority of which are middle and rich peasants. Most households look to their animals as an investment, a form of stored wealth, or as savings for emergencies. Nevertheless, animal sales and the sale of animal by-products represented over half of the monetary income generated from farm activities for all strata of the peasantry. Again, the scale of the activity is important in determining which family member controls the outcome of the activity. Among the landless and smallholder households, women generally take charge of marketing the animals, selling a chicken or a guinea pig in the market in order to purchase the weekly necessities. The sale of sheep is a major occasion, involving participation of both the father and mother. Where sheep raising is important--i.e., among the rich peasant households--the men control the marketing. Men also tend to control the marketing of milk to the milk-processing plant, although women generally milk and share responsibility for caring for the cattle.

The final activity which yields both use and exchange to the peasant household is artisan production, an activity in which 96 per cent of all households engage. Although overall responsibility for artisan production appears overwhelmingly female in table 2, there is an important distinction in the sexual division of labor based on whether the activity is geared to use-value or exchange-value production. Women are primarily charged with those activities which generate use values for the family's consumption: spinning, weaving, and sewing. In 76 per cent of all households women engage in these activities. When men are engaged in artisan production, they generally devote full time to it as tailors, brick-makers, carpenters, potters, or basket weavers.

In one quarter of the households, artisan production was geared to the production of commodities; fathers were the artisans in 42 per cent of these households and mothers in 33 per cent (table 6). Artisan production as an income-generating activity and particularly as a male occupation, is a characteristic of primarily landless and smallholder households. The differences in the time dedicated to this activity correspond to land-size strata, with landless and smallholder artisan households dedicating at least 180 days annually to this activity, and middle and rich peasant households that earn artisan income dedicating less than 52 days (table 4).

Petty Commodity Circulation

Petty commodity trading or "jiggling" is a family member's occupation in 17 per cent of the households. This is predominantly a female occupation, although men occasionally participate. (Men tend to dominate large-scale or wholesale trading activities.) Before the opening up of roads in the 1950s, the bulk of commodity circulation in the rural areas was carried out by women who would travel from market to market over the week. Today, these petty commodity traders have been largely replaced by traders from the city who scour the countryside in trucks during the harvest, buying up the crops. Nevertheless, petty commodity trading is still an important income source for rural women; most women who engage in trade spend a day or so a week buying goods from their neighbors; they take the goods into the city of Cajamarca for sale to the middlemen from the coast.

Another commercial activity in rural areas is the operation of country stores. Ten per cent of the households in the sample had stores in their homes. Operating a store is an important activity among middle and rich peasant women, who have sufficient capital to set up a diversified country store. Twenty-eight households dedicated an average of 162 days a year to commercial activities. This activity was carried out by women in 86 per cent of those households; only in the landless and smallholder households did men run stores.

Wage Work

The single most important source of monetary income for Cajamarcan peasants, particularly those in landless and smallholder households, is wage work. In 1976, 55 per cent of the households had at least one labor market participant in the household. In over one third of these households, one family member worked for a wage; in the remainder, various household members were part-time participants in the labor market. As table 2 illustrates, in the majority of households the father is the principal wage earner, although frequently sons also are wage earners (table 3). Not surprisingly, 85 per cent of the labor-market participants are men (table 5).

Although women make up a correspondingly smaller proportion of total participants in the labor market, their participation is significant those households where they are the primary wage worker (10 per cent of the households with part-time wage workers, and 13 per cent of those with full-time wage workers). All of the female labor market participants come from the smallholder stratum of the peasantry.

More mothers are full-time than part-time wage workers, which is a reflection of the kinds of occupations that are open to women. Female occupations are limited to two: milk maid on the dairy farms and domestic service in the city of Cajamarca. Milking jobs are most sought after by married women, for they provide stable employment and only require 4 or 5 hours of work a day, making them most compatible with use-value production on the farm. Domestic service, on the other hand, tends to be a live-in occupation, requiring the woman to be away from home. The only kind of part-time employment available

Table 5. Labor Market Participation by Family Member in Proletarian and Semi-Proletarian Households

(percentages)

Family Member	Proletarian	Semi-Proletarian	Total
Father	39% (n=11)	54% (n=30)	49% (n=41)
Son	39% (n=11)	34% (n=19)	36% (n=30)
Mother	14% (n=4)	7% (n=4)	9% (n=8)
Daughter	7% (n=2)	5% (n=3)	6% (n=5)
Total (n=84)	100% (n=28)	100% (n=56)	100%

N = 58 Households

Source: 1976 Peasant Family Survey.

to women is washing clothes or ironing on a daily basis, the activity carried out by the female semi-proletarians in the sample.

The majority of maids in the city of Cajamarca are young girls who live away from home. Since only labor market participants who live in the household full time have been included in the tabulation, the labor market participation of daughters has been underestimated. Nevertheless, once sons or daughters live away from home, not all of their wages will be returned to the household; therefore it is reasonable to exclude these participants in the calculation of household income.

Sons have a greater possibility of obtaining wage work in the rural areas, which possibly explains why daughters tend to leave the household at a younger age than sons. The primary sources of permanent employment for men are manufacturing, artisan production, or construction near the city of Cajamarca. While these sectors are also important sources of temporary work, the agricultural sector employs the majority of semi-proletarians.[12]

In summary, women in this peasant society do the bulk of the time-intensive tasks of daily maintenance. In addition, women participate actively in a variety of activities which generate use and exchange values for the family's subsistence. Men, in contrast,

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[12] Part-time work is becoming increasingly difficult to find; in the period 1973 to 1976, the mean number of days worked by semi-proletarians in the sample decreased significantly, from an average of 130 days a year in 1973 to 66 days in 1976. This is reflected in the overall decrease of the total number of days dedicated to the labor market for all participants from 193 days a year in 1973 to 150 days in 1976. In the same period, the number of semi-proletarians increased by 27 per cent, whereas the number of proletarians in the sample stayed constant.

predominantly engage in the production of exchange values. Differences in the activities in which the family may participate as well as the relative participation of men and women in the activities are related to the size of land holdings.

Participation in farm activities, whether measured in terms of the total time dedicated to the activity, the number of households within the land-size stratum participating, or the income generated by the activity, correlate positively with the household's access to the means of production. The activities that are an alternative to farming (wage work, artisan production, and commerce) correlate negatively with access to land.

Women control the production of use values and men of exchange values to the extent that as exchange values from farm production increase absolutely, men dominate the commercialization of the commodities which women have aided in producing. Among the upper strata of the peasantry, this is particularly the case in animal production. Among the poorer strata of the peasantry, women appear to take a more active role in agricultural production and in product disposition; they often control the proceeds from the sale of agricultural as well as animal products.

Petty commodity circulation is the major activity in which a degree of female autonomy is exerted by women of all strata that carry on this activity. But whereas women of the poorer strata tend to be involved in petty trade, women of the upper strata tend to run country stores.

Whereas women of all strata participate in artisan activities as use-value production, women of the poorer strata are much more likely to depend on artisan activities as a source of income. Among the poorer strata of the peasantry, if men participate in artisan production at all, they tend to specialize in a given craft as an exchange-value-generating activity. Wage labor, as well, is the domain of the poorer strata; both men and women engage in it, although men far outnumber women in the labor market.

Women's Contribution to the Formation of Household Income

This section summarizes the data on household income formation and the division of labor by sex and demonstrates the important contribution of women and children to the generation of household income. The differential returns to male and female labor and its implications for familial labor deployment strategies is considered.

Table 6 presents the aggregate data on the principal person responsible for a series of household income-generating activities and the relative importance of the activity in the formation of household income. (The disaggregated data by land-size strata are presented in the Appendix; tables 1-4).

Across all strata of the peasantry, adult women are principally responsible for commerce and animal production, which generate approximately one third of the mean net income, as well as mean monetary income, of the household. The importance of children in

Table 6. The Relative Contribution of Family Members Toward the Formation of Household Income by Importance of Income Source: All Peasant Households (Percentages)

Activity	Composition Mean Net Income	Composition Mean Monetary Income	Principal Family Member Responsible for Activity, Frequency Distribution				
			Mothers	Fathers	Children	All Family	Total
Ag Production	17.6%	11.3%	7%	60%	8%	25%	100% n = 102
Animal Care	23.6%	25.0%	62%	4%	23%	11%	100% n = 92
Artisan Production	5.2%	5.8%	33%	42%	12%	14%	100% n = 43
Commerce	9.2%	9.9%	86%	11%	-	3%	100% n = 28
Wage Work	33.8%	36.5%	8%	89%	1%	2%	100% n = 65
All Other Income	10.6%	11.5%					
Total N = 1050	100.0%	100.0%					

Notes: Participation data based on 1976 Peasant Family Survey with exception of wage work which is based on 1973 Cajamarca Income Survey, the income data source. Commerce participation is restricted to trading as profession and country stores; artisan production here includes only participation in income-generating activity.

the generation of household income is also apparent: in almost one quarter of the households, children have the primary responsibility for animal production, the activity which makes up approximately one quarter of household mean net and monetary income. Men are primarily responsible for the activity which contributes most to the formation of household income -- wage labor. In the majority of households, fathers are primarily responsible for the activities which generate approximately 50 per cent of household net mean and monetary income.

Here it is important to consider the differences by land-size strata. As the tables in the Appendix show, the predominantly female activities show the greatest relative importance in the composition of household income among the middle and rich strata of the peasantry. In terms of net household income, a majority of women in the middle peasant stratum are charged with the animal activities, which constitute 27 per cent of the household's mean net income. When only exchange values are taken into account, women from the middle and rich peasant strata account for 35 per cent and 39 per cent, respectively, of the mean monetary household income. In contrast, among the landless and smallholder households, female activities account for only 29 per cent and 22 per cent of mean net income and for 20 per cent and 22 per cent of mean monetary income, reflecting the lesser importance of, primarily, animal production in the composition of household income.

Women's lesser contribution to income formation among poorer households also reflects the greater integration of the household into the labor market and the increased dependency of the household on wage income. Further, it appears that the greater the degree of integration of the household into the labor market, the less women contribute to the generation of exchange values. Women's efforts to raise the family's standard of living are by no means negligible, however, as their higher contribution to the generation of household net income, as opposed to monetary income, demonstrates.

Conversely, the greater the degree of integration of the household into commodity production, the greater women's contribution to exchange value generation appears to be. This result suggests an interesting paradox, for as we previously noted, it is primarily among middle and rich peasant households that men play the dominant role in selling agricultural as well as animal products. The importance of the activity in household income composition is related to the household's access to the means of production, and we may conclude that women's relative contribution to household income formation is a function of the household's greater access to resources. Access to resources is, however, by no means a sufficient condition for female autonomy in the activity.

The Differential Returns to Male and Female Labor

Table 7 presents the data on returns to labor by sex per day worked in a series of activities in 1973. Agricultural production has been allocated to men and animal production to women, based on the data presented in table 1. Nevertheless, as the discussion above illustrated, the return to family labor from agricultural production is undifferentiable by sex, being a family activity in the majority of cases.[13]

What is immediately apparent is that in the activities in which both men and women engage -- artisan production and wage work -- men's remuneration is twice that of women's. One reflects the parameters of the labor market and the other of the product market. Within each activity, there is task specialization by sex. Women spin, weave, and sew, whereas men specialize in the production of pots or baskets or are engaged in artisan services (carpentry, logging, etc.). Whereas the female artisan activities represent an extension of women's work in the production of use values in the home, men's artisan activities take on the form of occupations, and are apparently remunerated as such.

In the labor market, as already noted, the jobs that are available to men and women are quite different. Although the average female proletarian worked one third more days in 1973 (principally

[13] The significant variation by land-size strata in the average return to labor in agricultural production must be noted. Whereas landless farmers earned S/.14 and smallholders S/.22, middle peasants earned S/.37 and rich peasants, S/1.19. The difference in magnitude is partly accounted for by the fact that the value of capital stock and of land were not consistently reported, so that depreciation was not taken into account in the computation of gross and net income.

Table 7. The Average Return to Female and Male Labor Per Day Worked, 1973 (In Peruvian Soles)

	FEMALE		MALE	
	Average Return	Number Days Worked	Average Return	Number Days Worked
Agricultural Production	-	-	S/ .33	28 (n=105)
Animal Raising	S/ .8	246 (n=87)	-	-
Artisan Production	S/ .20	42 (n=11)	S/ .43	169 (n=20)
Commerce	S/ .71	243 (n=12)	-	-
Wage Work	S/ .16	225 (n=6)	S/ .42	176 (n=61)

Note: In 1973 US$1.00 = S/.43.

The data on the number of days worked and income earned has been taken from the 1973 Cajamarca Income Survey. With the exception of wage work, the division of labor by sex was not specified in this survey, so the allocation of return to female and male labor is based on the results of the 1976 Peasant Family Survey. Artisan production was ascribed to female or male family members based on the specific activity (i.e., spinning to women, carpentry to men).

in domestic service) than the average male wage worker, female mean income from labor market activities was not quite half that of males.

The remuneration data suggest that women's contribution to household income from these activities is not commensurate with women's participation in the activity. Furthermore, it is particularly the poor peasant households that are affected most prejudicially by the differential returns to male and female labor, for women of the landless and smallholder households are the ones that primarily engage in wage labor or in artisan production as an income-generating activity.

Commerce is the activity that yields the highest return to female labor; it should be noted, however, that in the 1973 Income Survey, female traders were underrepresented as compared to owners of country stores, so that the high return to commercial activities shown in the data accrues primarily to women from the middle stratum of the peasantry.

The most poorly remunerated activity in terms of time is animal production. But it should be noted that the labor time dedicated to animal raising by women and children also includes production of other use values. Grazing, for example, is carried out in conjunction with a number of other tasks, such as wood gathering and spinning, as well as childcare. Nonetheless, the data show the low remuneration to female and child labor for an activity that is most crucial to the formation of total household income.

Given the significant wage differentials between men and women in the labor market, the foregone income from women's use-value and exchange-value production on the farm may far exceed the income they might make in the labor market. This is an indication of one determinant of the division of labor by sex.

Conclusion

The importance of taking into account the form and degree of integration of the peasantry into the economy is evident from the analysis. The interaction between familial labor deployment and the parameters of the labor market and product market are clear. In the first instance, the activities in which the peasant family may engage is a function of their access to subsistance means of production. In the second instance, the differential rewards to male and female labor determined by capitalist conditions of employment encourage greater male labor market participation and the changing division of labor by sex on the farm among the majority of poor peasants. Women take on greater responsibility for use-value production activities, such as agricultural work, and contribute to the household's overall income formation primarily through the generation of use values from farm activities. Poverty as a women's issue focuses squarely on the household's access to the means of production of subsistence on the one hand, and on capitalist conditions of employment, on the other.

Appendix

Table 1. The Relative Contribution of Family Members Toward the Formation of Household Income by Importance of Income Source: Near-Landless Households

Activity	Composition Mean Net Income	Composition Mean Monetary Income	Principal Family Member Responsible for Activity, Frequency Distribution				
			Mothers	Fathers	Children	All Family	Total
Ag Production	1.0%	0.4%	15%	62%	-	23%	100% n = 13
Animal Care	18.8%	8.5%	73%	-	27%	-	100% n = 11
Artisan Production	9.2%	12.5%	10%	70%	10%	10%	100% n = 10
Commerce	10.3%	11.4%	67%	33%	-	-	100% n = 6
Wage Work	55.5%	61.4%	18%	73%	9%	-	100% n = 11
All Other Income	5.2%	5.8%					
Total n = 140	100.0%	100.0%					

Table 2. The Relative Contribution of Family Members Toward the Formation of Household Income by Importance of Income Source: Smallholder Households

Activity	Composition Mean Net Income	Composition Mean Monetary Income	Principal Family Member Responsible for Activity, Frequency Distribution				
			Mothers	Fathers	Children	All Family	Total
Ag Production	10.2%	5.3%	8%	52%	11%	29%	100% n = 65
Animal Care	10.0%	8.2%	61%	5%	20%	14%	100% n = 59
Artisan Production	7.1%	7.6%	36%	40%	12%	12%	100% n = 25
Commerce	12.5%	13.7%	88%	6%	-	6%	100% n = 17
Wage Work	48.6%	53.1%	4%	94%	-	2%	100% n = 45
All Other Income	11.6%	12.1%					
Total n = 619	100.0%	100.0%					

Table 3. The Relative Contribution of Family Members Toward the Formation of Household Income by Importance of Income Source: Middle Peasant Households

Activity	Composition Mean Net Income	Composition Mean Monetary Income	Principal Family Member Responsible for Activity, Frequency Distribution				
			Mothers	Fathers	Children	All Family	Tota
Ag Production	19.6%	13.2%	-	84%	5%	11%	100% n = 1
Animal Care	27.0%	22.4%	59%	6%	24%	12%	100% n = 1
Artisan Production	4.1%	5.6%	20%	20%	20%	40%	100% n = 5
Commerce	10.4%	12.4%	100%	-	-	-	100% n = 5
Wage Work	23.5%	27.9%	13%	87%	-	-	100% n = 8
All Other Income	15.4%	18.5%					
Total n = 177	100.0%	100.0%					

Table 4. The Relative Contribution of Family Members Toward the Formation of Household Income by Importance of Income Source: Rich Peasant Households

Activity	Composition Mean Net Income	Composition Mean Monetary Income	Principal Family Member Responsible for Activity, Frequency Distribution				
			Mothers	Fathers	Children	All Family	Total
Ag Production	42.0%	32.2%	-	60%	-	40%	100% n = 5
Animal Care	24.4%	36.9%	60%	-	40%	-	100% n = 5
Artisan Production	2.1%	1.7%	100%	-	-	-	100% n = 3
Commerce	3.6%	3.3%	-	-	-	-	n = 0
Wage Work	11.4%	10.6%	-	100%	-	-	100% n = 1
All Other Income	16.5%	16.3%					
Total n = 81	100.0%	100.0%					

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CHAPTER 4: MEASUREMENT ISSUES AFFECTING WOMEN IN POVERTY

The Women's Issue in Measuring Household Economic Status and Behavior in Developing Countries

Eva Mueller
University of Michigan

Data collection strategies in less developed countries (LDCs) reflect the inferior economic role of women. Official statistics focus on household income and consumption and on the economic activities of the chief earner of the household (who is most often a male). The economic activities, hours, pay rates (or productivity) of secondary earners often are neglected, particularly if they are unpaid family workers. Moreover, much of the information that is available about women relates to women as individuals rather than as members of households. For example, while tabulations of official statistics may show what proportion of women work, it is seldom possible to analyze the incidence of female employment by husband's income or by marital status and number of children simultaneously.[1] Likewise it is difficult to analyze women's earnings in the context of earnings of other family members.

It is widely agreed that more and better statistical information about the economic status of women is needed. When one asks specifically -- What kind of information? -- it becomes more difficult to arrive at an answer. Much of the research and writing on poverty among women in LDCs has taken an institutional and sociological approach; little of it has

[1] On this point, see Nadia Haggag Youssef, Women and Work in Developing Societies, Population Monograph Series No. 15 (Berkeley, California: University of California, Institute of International Studies, 1974), p. 72.

been economic and quantitative.[2] A problem must be well defined before it can be measured or before its causes and consequences can be analyzed statistically. Although my assignment is to deal with "measurement," I must start by addressing myself to the concept of poverty among women.

Female Poverty: A Conceptual Framework

A person may be viewed as poor when he or she does not have adequate access to the necessities of life (recognizing that "necessities" are defined differently at successive stages of economic development and in different cultures). People gain access to the necessities of life primarily by two means. The first of these is work. Work is the principal means by which adult males secure the necessities of life. The productivity of work depends on the capital (land, tools, equipment, animals) and technology which a worker has at his or her disposal; it also depends on his (her) human capital (health and education). The inadequacy of these capital and technological inputs is as much a cause of poverty as are the insufficient number of available jobs and the social restrictions on women's labor force participation.

The second means by which people gain access to the necessities of life is the "support system." Support systems may be private (economic assistance from kinship groups, friends, or other mutual help networks) or public (social security, welfare, school lunches, free medical care).

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[2] An important exception is Ester Boserup, Woman's Role in Economic Development (New York: St. Martin's Press 1970); also by the same author "Employment of Women in Developing Countries," in Leon Tabah, ed., Population Growth and Economic Development in the Third World (Liège: International Union for the Scientific Study of Population, 1975).

Support may take the form of transfers of money, goods, labor (say, help in the fields or with childcare), or other services. These transfers may occur regularly--when migrants remit money to family members left behind in rural areas, when children help to support aging parents, or when a man provides regular support for a widowed or separated sister. Support may also be given irregularly in the form of large or small gifts for special occasions (weddings, birthdays, harvest time), or it may occur sporadically when the donor has a surplus.

Because of their childbearing and childrearing responsibilities, their greater longevity, and because of social restrictions on their labor force participation, women tend to be more dependent on the support system than are men. I believe that one of the problems that women face in developing countries is the deterioration of the private support system under the influence of ongoing economic and cultural changes. Familial obligations are weakening before the economy has reached a sufficient level of development to be able to afford and to organize public support systems.

Uncertainty regarding access to the necessities of life is likely to affect women's attitudes. It is commonly assumed that insecurity may generate fear of deprivation, willingness to subordinate oneself to others, a desire to strengthen family ties and to have large families. Insecurity thus has been blamed for traditionalism among LDC women, since modernization tends to weaken familial support systems. While such attitudes are in part a result of poverty, they also contribute to poverty in that they prevent women from taking constructive actions which could strengthen their economic position. Examples of such actions would be getting more education, insisting

on a more active part in decisionmaking within the household, forming voluntary associations of women, being politically active, insisting on access to maternal and child health services, vocational training, credit, childcare facilities, etc.

However, we know very little about poverty-related attitudes among LDC women. In contrast to the above hypotheses, it has been suggested that the weakening of the support system "liberates" women from traditional familial constraints, inducing them to pursue more vigorously employment opportunities and more equal roles in the family and the community.[3]

In sum, three central aspects of women's poverty require study at the micro level: their employment problems, their support systems, and their attitudes. Figure 1 depicts the interrelationships between these three aspects of poverty and their causes and consequences. Data on employment patterns, on the support system, and on poverty-related attitudes (the center panels of figure 1) should enable us to measure the incidence and extent of poverty among women.

Descriptive data on the economic status of women can be useful as a means of drawing the attention of the general public and of policy makers to poverty among women.[4] Data also should enable us to analyze the causes and consequences of female poverty, a necessary first step toward policy changes. Since the poverty of women has many causes and consequences, it is not possible to deal with the measurement of all of these. Rather,

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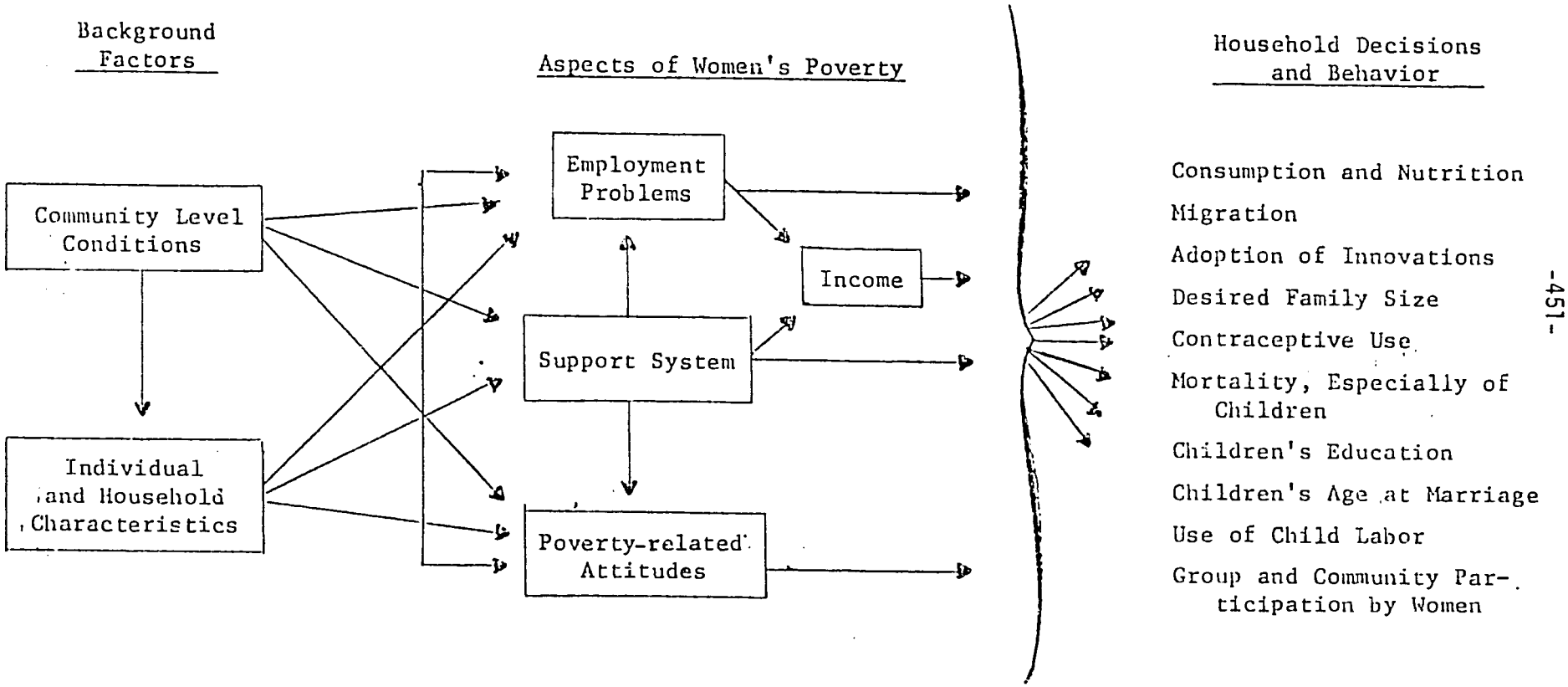
[3] Youssef, op. cit., chaps. 7 and 8.

[4] See, for example, U.N. Economic Commission for Africa, "The Data Base for Discussion on the Interrelations between the Integration of Women Development, their Situation and Population Factors in Africa," Addis Ababa, 1974.

Figure 1. Poverty among LDC Women: A Conceptual Framework



I shall focus on the three central aspects of poverty and then discuss more briefly the collection of background or causal variables. Data on the consequences of female poverty cannot be discussed within the scope of this paper. The right side of figure 1 merely lists some of the important kinds of decisions and behaviors which are thought to be affected by female poverty.

Data Collection

There are of course many kinds of data collection: censuses; government surveys with large samples, which are intended primarily for time-series analysis of such variables as employment and unemployment or agricultural output; anthropological studies of particular villages or population subgroups within these villages; case studies at the macro or micro level; and the like. This paper describes the kind of data which may be collected from moderate-sized, representative samples of households (say 2000-4000 cases) by personal interview surveys. Such surveys are a suitable method for supplementing the tabulations available from official statistics. In contrast to small village studies, such surveys permit generalizations to a larger population, of which the sample is representative. They also permit multivariate analysis of important interrelationships among the variables covered by the survey.

Surveys of representative samples of women also enable us to deal with the heterogeneity of women's status and roles, even within the same country. One important contrast that needs study is that between upper-class, well-educated women, who can obtain satisfying professional employment, and very poor women, who are forced to do the most menial and underpaid kinds of work. Yet the changing economic status of middle-class

women also is of interest. Economic class is not the only factor which creates differences in the economic status of women. The economic characteristics of the place in which women live, age, family characteristics, ethnic differences, and the like, have a bearing on women's economic status. Macro, or grouped, data hide many of these differences and make it difficult to exploit such variances for analytical purposes.

A primary requirement of surveys which focus on women is that a sample be drawn that is representative of all kinds of women. The women who are most likely to have economic problems are women who are not wives of male household heads. Thus the sample must be designed to give adequate representation to the following groups: female heads of households (distinguishing between those who have never been married, those who are separated, divorced, or widowed); unmarried daughters of working age (say, over 14) who live in nuclear or extended families; mothers or mothers-in-law and other female relatives of the household head; female servants living in the employer's household; and, in urban areas, women who live in rented rooms, rooming houses, or dormitories. Since in many countries some of these categories of women constitute a small proportion of the population, they may have to be oversampled.

In official censuses or surveys, data about women often are obtained from male members of the household. This procedure is unsatisfactory for studies of women. In the first place, women are likely to know more about their own work and support systems than the household head does. This may be particularly true for women who live in consensual unions and women other than the respondent's wife in an extended family. It should also be true in some African societies where women keep their economic

affairs quite separate from their husbands'. Second, in some cultures men may be embarrassed about their wife's work and thus underreport it. Finally, attitudinal data must be obtained from the women themselves. No one can reliably report the attitudes of another individual. If women are to be interviewed, it is highly desirable (and in some cultures necessary) to use women interviewers.

One word of caution is needed at this point. Developing countries differ considerably among themselves: Their economies are organized in different ways, their cultures and family systems are quite diverse, the status and economic roles of women differ. Thus whatever I suggest below about data requirements must be modified to fit the conditions prevailing in a particular country.

Employment and Related Issues

Employment data now being collected in LDCs are quite limited in scope, being designed primarily to measure changes over time in labor-force status, employment, and unemployment. More information is needed.

First, we need a longer time perspective in employment studies than such studies now provide. The conventional employment statistics report work experience in the week preceding the interview. The shortness of the reference period enhances the accuracy of recall, but for analysis purposes a week (or even a month) is not a meaningful reference period. In LDCs, particularly in rural areas, work is highly seasonal and may be available only intermittently for other reasons as well. In many countries women as well as children are the reserve work force. They are called upon to participate in market work primarily when seasonal labor demands are high.

Or, the prevailing division of labor may assign certain tasks to women (weeding, rice transplanting, work in a canning factory) that are of limited duration. A woman who happened to work during the reference period may work only 2 or 3 weeks (months) during the year, or she may have year-around employment. If we want to assess the employment situation of women and their productive contribution, it is important to determine the approximate amount of time women devote to market work over the period of a year. This objective is best approached by finding out how many weeks a woman worked during the year and how many hours per week during different seasons. Ideally, such data should be obtained by interviewing the same women several times during the year. If this is not feasible, one has to rely on recall, realizing that work is a salient aspect of people's lives and probably reasonably well remembered.

Women often contribute to family earnings in a number of ways, making it important that all income-earning activities be reported. For example, a woman may help on the family farm or in a family enterprise (say, a store or restaurant). During the off-season she may take in laundry, produce handicrafts, brew beer for sale, or work on someone else's farm. Especially if she is poor, she may scrape together a living by engaging in several such activities. Unless there is an inquiry into time use or a sequence of questions on multiple jobs, secondary occupations may well be omitted. In some countries censuses and surveys have intentionally disregarded unpaid family work, in others such work has been covered. Unpaid family labor on farms and in small nonfarm enterprises is an important part of women's work in developing countries and should be included in the definition of employment. Special probing is necessary to

make certain that it will not be overlooked.

Information on the setting in which women work is valuable. Of particular interest, especially for the analysis of fertility decisions, is the question of whether the woman works at home or away from home. Work at home is much more compatible with child rearing than work away from home, and it also exposes the woman less to outside modernizing influences. If she is an employee, the size of the establishment for which she works must be determined. Larger establishments tend to be more modern and to expose women to a larger number of people than smaller ones. More important, larger establishments usually employ more capital and a more advanced technology, enabling them to offer better wages and working conditions. On the other hand, the larger the establishment, the less likely it is that a woman can bring a baby to work or take time off to nurse a baby. Because of their domestic duties, lack of training, and sometimes outright discrimination, women in many developing countries have very limited access to jobs in the large-scale, or organized, sector.[5]

For many women employment opportunities are constrained by their responsibility for housework and childcare. Thus information on the time required for housework and childcare in families of different sizes and with children of different ages should help to explain time available for income-earning activities. If some norms could be computed regarding minimal time required for childcare and domestic chores in households varying in size and composition, one could begin to identify, on the one

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[5] A recent study found that in India only 6 per cent of working women are employed in the organized sector (including government employment and employment in medium-sized or larger private establishments). See Indian Council of Social Science Research, Status of Women in India (New Delhi, 1975), p. 63; see also Thomas Merrick and Marianne Schmink, "Households Headed by Females and Urban Poverty in Brazil," elsewhere in this volume.

hand, women whose income-earning activities are so extensive that such activities may have a detrimental effect on the health of both the children and the women, and on the other hand, women who are not fully occupied. Of course housework may be shared by a number of household members. This pattern of sharing should be investigated, both for the light it throws on the work burden which women carry as well as for the insights it provides into male, female, and child roles in the household.

The ideal way to collect data on the distribution of time between housework, childcare, and income-earning activities is by time-budget studies, which account for all time spent during a particular day. One important advantage of time-use studies is that, unlike conventional employment surveys, they make it feasible for the researcher to separate out activities that are on the borderline between domestic work and income-earning activities. Examples are processing food (which may be partly for domestic consumption and partly for sale), producing clothing or utensils for the household or others, tending a vegetable garden near the house, collecting food or fuel, etc. In industrial countries, these activities are shifted to the market and hence are counted as income-earning activities. Another advantage of time-use studies is that they permit the recording of concurrent activities. Childcare, in particular, often takes place simultaneously with housework and leisure, and sometimes in LDCs, with market work.

Since no single day or week can be representative of time use, such studies should be based on several interviews with each respondent, preferably during different seasons of the year. If we want to analyze and

understand the distribution of work activities between age and sex groups, time-budget studies should cover all members of the household. If income data are collected from the same individuals whose time use has been measured, the impact of family composition and time use on income can be studied. I shall not discuss time-use studies further since other papers in this volume deal with this topic (see for instance, the studies by Evenson and Quizon, and DaVanzo. It suffices to mention that conducting such studies in LDCs, where respondents cannot be asked to keep written diaries, is time-consuming and expensive, and the methodology is still in an experimental stage.

There is very little data available now for LDCs that permit analysis of wage rates and earnings simultaneously by age, sex, and occupation. Needless to say, wage rates and earnings data should include income in kind Full information about all work activities undertaken by a woman helps in estimating her total earnings. When women work for others, a question about their wage rates should be asked; and when they are self-employed their annual earnings from the businesses should be estimated. When women are doing unpaid family work, their individual earnings rates are difficult to identify. They can be estimated statistically only if duration of work time by each participant and total earnings from the joint work during the same period are available. As a crude, but perhaps more feasible, alternative to such statistical estimation, women may be asked how much they would have had to pay to hire someone to do their unpaid family work.

Data on wage rates and earnings by age and sex are crucial for a number of analytical purposes. First, for the analysis of poverty it is important to distinguish among women who earn little because they are not engaged in full-time work, those who earn little because of low wage rates, and those who earn little because of both limited working hours and a low rate of pay. Further, economists view the wage rate as an important input into decisions regarding amount of time worked. And wage rates obtainable by young girls determine the opportunity cost of time spent in school. Finally, wage rates paid to more mature women represent an opportunity cost of time spent on housework and childcare. Therefore wage rate and earnings data are highly useful for studies of the economic aspect of fertility decisions.

The productivity of work is a function of the capital and technology associated with that work. Women's work often is less productive (and hence less renumerative) than the work of men, because women are assigned to tasks which require a minimum of capital and employ a traditional, labor-intensive technology. The importance of collecting some data on the kinds of capital and technology women have at their disposal for their work (including housework and unpaid family labor) cannot be sufficiently emphasized. Women may have much more difficulty than men in obtaining the credit that would enable them to buy the tools and materials that could raise their earnings, so it would also be interesting to ask men and women about their experiences with, and their perceptions of, local credit agencies (if any).

Finally, inquiry should be made about childcare arrangements available to mothers who work away from home and their satisfaction with these arrangements. Some mothers may be able to take children with them to work; others may have relatives who take good care of the children; but many may have quite inadequate arrangements, such as leaving babies or small children in the care of older children. Women who are not doing work outside the home should be asked whether someone would be available to take care of their children if they did wish to work outside the home.

Support Systems[6]

As noted earlier, in most developing societies women receive all or part of their subsistence from a familial support system. This is most true of married women, although in the lowest income groups husbands may not earn enough to support their families, so that the wives' labor-force participation is a necessity. Table 1 shows, for selected developing countries, the proportion of women who are without a husband when they reach their late 30's and the still larger proportion who are without husband by their early 50's. Single, widowed, divorced, separated, or abandoned women, and those living in consensual unions, have different degrees of access to nonwork sources of support. Not only do kinship obligations toward women differ among cultures and among economic groups within the same culture, but migration, death, familial conflict, or the happenstance of having few close relatives may deprive some women of a reliable source of support in societies where kinship obligations are normally strong. Also, economic development and modernization bring about changes which may weaken traditional familial support systems. The pervasiveness of this trend has not been studied, but most observers agree that it is serious and that it adds a new element of uncertainty to the economic welfare of women.

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[6] The importance of intrafamily and intergenerational transfers has recently been argued forcefully by John C. Caldwell, "Toward a Restatement of Demographic Transition Theory," Population and Development Review, September/December 1976, pp. 321-66.

Table 1. Marital Status of Females in Selected Countries in Two Age Groups

Country	Age 35-39			Age 50-54[a]		
	% Married	% Single	% Widowed, Divorced, Separated	% Married	% Single	% Widowed, Divorced, Separated
India (1971)	91.7	0.5	7.7	62.5	0.4	37.0
Indonesia (1971)	84.0	1.4	14.6	53.6	1.0	45.4
Colombia[b] (1973)	74.9	16.7	7.7	62.3	15.7	21.2
Peru[b] (1972)	82.2	11.1	6.2	69.2	10.8	19.2
Kenya (1969)	86.2	3.2	10.0	66.4	3.0	30.0
Uganda (1969)	81.7	5.3	12.9	59.3	6.5	34.3

[a]For Kenya age group 50-59.

[b]Married category includes those in consensual unions; single category includes women with children but without a stable male partner.

SOURCE: Demographic Yearbook 1976, Marriage and Divorce Statistics (United Nations, 1977). Figure in parenthesis indicates census year.

Transfers are flows of goods and services which do not represent compensation for work performed but arise from a sense of kinship or social obligation. Any one family may give and/or receive transfers. Among the small number of existing studies on interhousehold transfers in developing countries, the majority are confined to migrant households and are concerned with the economic impact of remittances from migrants;[7] others are interested in the impact of remittances on income distribution.[8] I am not aware of any studies in developing countries which focus specifically on the incidence and amount of interhousehold transfers to various categories of women.

The dimensions of the support system which are of greatest interest are 1) the likelihood that a woman in a given situation will receive transfer payments; 2) the amounts of money, goods, and services transferred; 3) the characteristics of givers and receivers of transfers; 4) the circumstances under which transfers occur; and 5) the dependability of the transfer system. It is quite feasible in a survey to ask people to report all transfers they received during the course of a year and all support they gave to others (excluding transfers within the household). If some

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7 The findings of many of these studies are summarized in Oded Stark, "Rural-to-Urban Migration and some Economic Issues: A Review Utilizing Findings of Surveys and Empirical Studies Covering the 1965-75 period," Working Paper #38, ILO, Population and Employment Project (Geneva, 1976).

8 See especially G. E. Johnson and W. E. Whitlaw, "Urban-Rural Income Transfers in Kenya: An Estimated Remittance Function," Economic Development and Cultural Change, Vol. 22, No. 3 (April 1974); also James C. Knowles and Richard Anker, "An Analysis of Income Transfers in a Developing Country: The Case of Kenya," Working Paper #59, ILO, Population and Employment Project (Geneva, 1977).

approximate value can be assigned to these transfers, estimated receipts by households can be added to, and estimated disbursements substracted from, income.[9]

For fertility analysis, the reciprocal roles of parents and children in the support system are of particular interest. In studies of women, inquiries are also needed about the role of other relatives, of employers (as in the traditional Indian caste system), and of well-to-do individuals in the community. In addition to being asked about who actually provided transfers to whom in the past year, people can be questioned about their expectations. On whom does a particular female respondent think she can rely for economic assistance in times of distress? How certain is she that support would be forthcoming? Under what circumstances might she obtain help?

If some elements of a public support system are available in the study area, questions would also be asked about who in the community has benefitted from those government transfers -- who has received free school lunches, health care in a government clinic, instruction by the extension service, welfare payments, or shelter in subsidized housing. It would be interesting to compare the extent to which men and women benefit from such programs in a particular country.

An investigation into the transfer system could deal most readily with interhousehold and government-to-household transfers; but it must be kept in mind that women may be absorbed into extended families instead of being supported in a separate household. For example, rather than sending funds to a widowed sister's household, a man may move the sister and her children into his own household. She may or may not add to family

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[9] The value of some important kinds of assistance cannot be quantified; for example, helping someone to find a job, secure a loan, lending work animals or equipment, exerting political influence on someone's behalf.

income by engaging in market work. Likewise, female heads of household may take in relatives who may be secondary earners,[10] help with childcare while the mother goes out to work, or merely share in household consumption. There are very few studies which have investigated the economic factors influencing household composition in LDCs.

Attitudes

A woman's attitudes -- her sense of independence, personal effectiveness, security, aspirations -- are a result of a variety of background factors and economic circumstances, which, in turn, influence employment patterns and household decisions. While attitudes are, in part, a rational response to external circumstances, many basic attitudes are formed early in life, change little thereafter (except under extreme circumstances), and thus have an important historical component. A number of studies have dealt with the attitudes of women in developing countries, but often conceptualization and measurement have been quite haphazard. Such studies should be developed by psychologists rather than economists. Therefore it must suffice to review briefly some examples of attitude measurement and to emphasize the need for data on poverty-related attitudes.

Many of the studies that have concerned themselves with women's attitudes have attempted to measure a rather vague concept called "modernization."[11] An exemplary attempt of this kind is contained in a brief monograph by David Goldberg,[12] who distinguishes between three

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10 In the importance of this phenomenon, see Merrick and Schminck, op. cit.

11 See for example Ray Mohini Seti, Modernization of Working Women in Developing Societies (New Delhi: National Publishing House, 1976).

12 David Goldberg, Modernism: The Extensiveness of Women's Roles and Attitudes, International Statistical Institute, World Fertility Survey, Occasional Paper No. 14, 1974.

aspects of modernization, which he calls "power" (who makes household decisions), "segregation" (attitudes to sex roles), and "containment" (restriction of wife's activities outside the home). Each of these he relates to background factors, which are viewed as causes, and fertility decisions, which are viewed as consequences.

Psychologists have developed scales that measure people's sense of personal efficacy, that is their perception of the extent to which they control their environment and their own lives rather than being controlled by fate, other people, or their life circumstances.[13] Such scales, after they have been adapted to fit a particular culture, could contribute to our understanding of the psychological implications of poverty. For example, planning for the future and being concerned about the long-run consequences of particular decisions require, and are part of, a sense of personal efficacy.

There are other attitudes, which may be less deep-seated and lasting psychologically, that arise directly out of the economic situation with which women have to deal. The most relevant case in point are attitudes toward work. Why does the woman work? How does she perceive the advantages and disadvantages of working? What does she like and dislike about her present work? How does she perceive her husband's attitudes toward working women? How adequate in her opinion is the amount of time

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[13] See Gerald Gurin and Patricia Gurin, "Personal Efficacy and the Ideology of Individual Responsibility," in Burkhard Strumpel, ed., Economic Means for Human Needs (Ann Arbor: Institute for Social Research, 1976).

she can devote to housework, childcare, her husband, rest, and leisure?[14]

One could extend such lists of interesting questions indefinitely. My main purpose is to suggest that 1) the relationship between poverty and women's attitudes must be conceptualized carefully; and 2) poverty-related attitudes must be studied along with the strictly economic aspects of poverty, since they may influence household decisions.

Background Data[15]

Background data, on a woman's own socioeconomic and demographic characteristics and those of the household to which she belongs, are essential to analyze the causes of poverty. To start with, all household members should be enumerated and data obtained on their ages, marital status, work status, occupation, and education. Questions should also be asked about absent members of the household -- that is, people who have migrated for shorter or longer periods. Such people may be part of the support system on which a woman's economic situation depends.

The demographic data for each woman should include type of marital arrangement, age at which she first entered this arrangement, age of oldest child, number of children born to her, number of surviving children, number of children who died, the number and ages of children presently in the household. Such data give some clues about the extent

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[14] See S. N. Ranade and P. Ramachandran, Women and Employment: Reports of Pilot Studies Conducted in Delhi and Bombay (Bombay: Tata Institute of Social Sciences, 1970); also Deborah Freedman and Eva Mueller, Economic Modules for Use in Fertility Surveys in Less Developed Countries, International Statistical Institute, World Fertility Survey, Occasional Paper No. 12, 1974.

[15] Guidance in obtaining background information is available in Deborah Freedman and Eva Mueller, A Multi-Purpose Household Questionnaire: Basic Economic and Demographic Modules (Washington, D.C.: World Bank, 1977).

to which childraising responsibilities have competed in the past, and are currently competing, with market work.

Education, like other forms of human capital, is less accessible to women than to men. We are interested not only in women's formal schooling but also in on-the-job training and vocational education. In rural areas, particularly, it is important to find out whether there are any extension or other training programs in which women can participate, whether the women in the household have received any such training and if so, whether the skills taught pertain to income-earning activities or exclusively to their roles as mothers and housewives. Parallel educational data for male members of the household would, of course, be valuable.

Education and training may enhance the productivity of women not only in market work but also in housework and childcare. For example, one suspects that meaningful instruction of young women in nutrition could contribute more to families' nutritional status than a work pattern which allows women to spend long hours on meal preparation. Similarly, it has been argued that in the United States the quality of childcare is enhanced by the mother's education.[16] Patricia Engle suggests that contact with the more educated women on a project staff may have benefitted the development of a group of Guatemalan girls.[17] Use of contraceptives also has been shown to increase with female education.[18]

To obtain data on economic background, household income and the major sources from which it is derived would be measured. It is also worth

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16 Arleen Leibowitz, "Home Investments in Children," Journal of Political Economy, March/April 1974, pp. 111-31.

17 Patricia Engle et al., "Sex Differences in the Effect of Nutrition and Social Class on Mental Development in Rural Guatemala," elsewhere in this volume.

18 Susan Hill Cochrane, "Fertility and Education: What Do We Really Know?" (Baltimore: Johns Hopkins University Press, 1978), Ch. 6.

knowing how much various categories of household members contribute to household income, although individual contributions cannot be reported separately when several members work on a family farm or in a family business.

Since family income is difficult to measure in some LDC situations, data on major household assets may have to be collected as a complement to, or substitute for, household income. The characteristics of the house in which the family lives, land holdings, large animals, and ownership of major durable goods (watches, bicycles, sewing machines, etc. -- the specific list depending on the society being studied) are approximate indicators of the family's economic status.

Community-level Variables

Female poverty may be caused by individual circumstances, such as insufficient education, demographic and ethnic characteristics, or lack of land and other kinds of capital which enhance productivity. Other important causes of poverty operate at the community level, such as climatic conditions, economic and geographic features of the community, prevailing family structures and values, etc. Such community-level variables can be incorporated into the analysis by making comparative studies (for example, using the same questionnaire in a number of places which provide some contrast in community characteristics). Comparative studies which involve several countries have become quite popular. Yet, it is difficult on the basis of comparative studies, to disentangle how each of the numerous cultural and economic differences between localities in culture and economic affect the dependent variable, which is, in our case, observed differences

in the economic status of women. Nor do comparative studies readily reveal how numerous community, household, and individual characteristics interact to affect the lives of women.

In many LDCs there are great variations in community characteristics among the places that fall into a representative national sample.[19] If the most relevant community-level variables are measured with a special questionnaire, they can be incorporated into the statistical analysis to throw light on the reasons for differences in the economic role of women. Inquiry about community characteristics may be made of a few knowledgeable people in the place, such as the mayor or village headman, other government officials, the head of a cooperative or extension service, school teachers, doctors, and the like. Since only one community-level questionnaire needs to be completed for each community, a community-level inquiry is a rather inexpensive supplement to a household survey.

Obviously a community-level questionnaire must be designed with the cultural and economic variations existing in the study area in mind Examples of information that should be useful for studies of female poverty include local employment opportunities for men and women; whether there is a factory or other large employer in the place; whether people commute to jobs in nearby cities or towns; means of transportation; access by road; availability of electricity; prevailing wage rates for men, women, and children; in- and out-migration patterns; location of the markets which are most widely used; role of women in marketing; type of crops grown; agricultural equipment used by the men, women, and children; agricultural techniques used; major public and private community

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[19] See for example, Indian Council of Social Science Research, op. cit., pp. 1-38; also Audrey Chapman Smock, "Ghana: From Autonomy to Subordination," in Janet Zollinger Giele and Audrey Chapman Smock, Women (New York: John Wiley, 1977), pp. 175-212.

facilities (health, education, cooperatives, extension, credit) and programs for women available in the area and their relevance to women; mass media penetration; prevailing family structures; location of responsibility for economic support of female relatives without husbands; degree of such responsibility; class structure in the place; and so forth.[20]

Concluding Remarks

A few of the items of information for which this paper has called could probably be obtained by making modest additions to ongoing censuses and government surveys. The value of such official statistics for analyzing the economic problems of women might thereby be enhanced appreciably. Some additions to the traditional employment questions are particularly to be desired.

However, much more could be learned if an entire survey could be devoted to the study of female poverty, and still more if two or three such surveys could be conducted in different parts of the less developed world. Since the several elements of female poverty interact with each other and should be studied jointly and female poverty should be related statistically to its causes and effects, it would be desirable to obtain for each woman in a representative sample (of women, not households) many or most of the categories of information outlined in figure 1.

To be sure, the data needs which have been described in this paper are very extensive, and it is unlikely that even a survey devoted entirely to women's issues could provide all the items on my shopping list.

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[20] For examples of community-level questionnaires, see Ronald Freedman, Community-Level Data in Fertility Surveys, International Statistical Institute, World Fertility Survey, Occasional Paper No. 8, 1974; also John Caldwell, "Community Information Sheet," Document 6(1), Canberra, The Australian National University, Department of Demography.

This is all the more true since we would be well advised not to investigate the poverty of women separately from the poverty of men. Thus the researcher will have to be selective, using a theoretical framework, his or her knowledge of the country in question, and relevance to local policy issues as the criteria for selection.

Productivity and Poverty of Third World Women: Problems in Measurement

Elise Boulding
University of Colorado at Boulder

How useful are currently available statistics on women for estimating the status of women and for providing a guide to integrating women into development? What information about women do governments collect? How is women's productivity defined and measured? The statistics gathered by the United Nations on women as actual and potential producers and actual and potential breeders reflect the concerns of national governments to know their present and future reserve labor-force capacity.[1] Figures on present labor-force participation by sector suggest in which directions present female labor could be shifted if desired. Figures on economically inactive homemakers indicate the reserve supply. Figures on female migration tell where that labor force is; figures on education what its modernizing potential is; and figures on marital status, life expectancy, fertility, and child/woman ratios what the capacity for production of the future labor force is. (See table 1 for a listing of indicators of the status of women directly available to planners from currently utilized United Nations data categories for women.)

From governmental perspectives, the plan for integration of women into development involves the optimal infusion of women into the market economy from an established baseline of "free Labor" of women

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[1] See Oakley and Oakley (1978) for the broader issue of sexism in statistics, which is not dealt with here.

Table 1. Indicators* of the Status of Women Directly Derivable from United Nations Data in 1974

General Economic Activity

Crude Labor Force Participation Rate for Females
Index of Femaleness for Economic Activity
Index of Female Economically Inactive Homemakers

Economic Activity by Status

Index of Femaleness for Self-Employment; for Employee Status; for Unpaid Family Worker Status
Distribution index for Self-Employed Females; for Female Employees; for Female Unpaid Family Workers

Economic Activity by Industry

Index of Femaleness for Agriculture and Related Industries; for Mining and Quarrying; for Manufacturing; for Electrical, Gas, Water, and Sanitary Services; for Construction; for Commerce; for Transport, Storage, and Communication; for Service
Distribution Index for Females in Agriculture and Related Industries; for Females in Mining and Quarrying; for Females in Manufacturing; for Females in Electrical, Gas, Water, and Sanitary Services; for Females in Construction; for Females in Commerce; for Females in Transport, Storage, and Communication; for Females in Service

Economic Activity by Occupation

Index of Femaleness for Professional and Technical Work; for Administrative and Managerial Work; for Clerical Work; for Administrative, Managerial and Clerical Work; for Sales Work; for Service Work; for Agriculture and Related Work; for Production and Related Work; for the Armed Forces
Distribution Index for Females in Professional and Technical Work; for Females in Administrative and Managerial Work; for Females in Clerical Work; for Females in Sales Work; for Females in Service Work; for Females in Agriculture and Related Work; for Females in Production and Related Work; for Females in the Armed Forces

Literacy and Education

Index of Femaleness for Illiteracy
Index of Female Illiteracy
Index of Femaleness in Literacy Courses
Median Educational Attainment for Female and total Population, Ages 15-24
Median Educational Attainment for Female and Total Population, Ages 35-64
Student Enrollment Ratio for First and Second Level Education
Student Enrollment for First Level Education

* The Index of femaleness measures how "female" is the population engaged in any activity undertaken by both men and women, the distribution index is a measure of the proportion of persons in one particular category to all persons in a group of related categories, i.e., the proportion of females engaged in a particular activity, to all females in the relevant categories (such as all employed females in the employment indicators). From Boulding, et al., 1976.

Table 1. Continued

Student Enrollment Ratio for Second Level Education
Index of Femaleness in Third Level Education; in Field of Education at Third Level; in Field of Law at Third Level; in Field of Social Sciences at Third Level; in Field of Engineering at Third Level; in Field of Agriculture at Third Level

Migration

Index of Femaleness in Long Term Immigration; in Long Term Emigration

Marital Status

Crude Rate of Marriage
Crude Rate of Divorce
Distribution Index for Females in Singlehood; for Females in Marriage; for Females in Widowhood; for Females in Divorce
Minimum Legal Age of Marriage for Females and Males

Life, Death and Reproduction

Life Expectancies for Females and Males at Birth
Average Size of Household
Fertility Rate
Crude Birth Rate
Index of Femaleness for Live Births
Index of Illegitimacy
Child/Woman Ratio
Child/Woman Ratio Urban
Child/Woman Ratio Rural
Index of Femaleness in Infant Deaths
Infant Martality Rate
Index of Femaleness for Deaths
Distribution of Index for Births by Duration of Marriage Less than 1 Year; for Births by Duration of Marriage 4 or Fewer Years; for Births by Duration of Marriage 5 to 9 Years; for Births by Duration of Marriage 10 to 14 Years; for Births by Duration of Marriage 15 to 19 Years; for Births by Duration of Marriage 20 or more Years; for Births to Mothers Under age 15: for Births to Mothers Age 15 to 19; for Births to Mothers Age 20 to 24; for Births to Mothers Age 25 to 29; for Births to Mothers Age 30 to 34; for Births to Mothers Age 35 to 39; for Births to Mothers Age 40 to 44; for Births to Mothers Age 45 or More

and children in the home. Since two key measures of development are 1) the growth of the market economy, and 2) population growth in relation to growth of GNP, all that governments find it necessary to know about women are their production and reproduction rates, the size of the economically inactive reserve labor force, and the educational level of the current and future labor force. Some attempt has been made, it is true, to modify the mechanistic orientation of development planners by emphasizing education, life expectancy, and labor-force participation as variables that indicate the "quality of life" of women and, point to options and choices. This approach, however, is not persuasive, in light of the fact that national statistical aggregations mask the fact that the poorest 40 per cent of the Third World (the majority of whom are women and children) generally enjoy between 8 and 15 per cent of the national income (United Nations, 1974 Report of the World Social Situation:Table 37).

In the first section of this paper I will show how misleading the United Nations statistics are for development planning based on the "integration of women into development" concept, since the same perceptual biases that lead to the counting of women as productive only if they are in the market economy lead to serious undercounting of women even in that "recognized" sector. In addition, estimates of gross national product (GNP) are badly skewed because they ignore the economic value of the "free labor" of women and children. In the second part of the paper I will suggest a development model that is based on an expanded version of the basic needs strategy, and put forward indicators of the status of women and children appropriate to that model.

Present Practices: The Counting of Women

Women are counted by governments in seven ways: 1) as a total population of females, usually by age categories; 2) as economically active, by sector, occupation, and status; 3) as economically inactive; 4) by education received; 5) as migrants; 6) by marital status; and 7) by life expectancy, death, and reproduction rates.

Accuracy of enumeration of persons of any social category depends on the quality of the enumeration system of a given country, and the enumeration infrastructures are not well developed in many Third World countries. Numbers reported may be based on official guesses, sample surveys, or, in a few cases, on complete enumeration. Add to the general deficiency of reporting infrastructures the perceived unimportance of women, the attendant social invisibility of most of their activities, and the recency of the practice of counting women at all as separate persons, and the realistic conclusion is that there will be undercounting of women in all societies, most of all in the Third World.

Enumeration of women in the labor force is done according to rules laid down by the United Nations. They can be summarized as follows:

> [The] total economically active female population is the sum of those females above a specified age, generally fourteen or fifteen, who furnish labor for the production of economic goods and services -- for market or exchange in contrast to those for individual or family use, subsistence, or consumption. Unless otherwise noted, it must be assumed to include members of the armed forces (Boulding et al., 1976:296).

The total economically active female population encompasses "the total of employed persons (including employers, persons working on their own account, salaried employees and wage earners, and so far as

data are available, unpaid family workers) and of unemployed persons at the time of the census or survey" (1972 Yearbook of Labour Statistics, 1972:3). Unpaid family workers can be included if they contribute at least one third of normal working hours to an economic enterprise operated by another household member, and unemployed women are to include those seeking work for the first time. Specifically excluded are students, women who are solely homemakers, retired persons, persons living on their own means, and those "totally dependent on others," as well as all institutionalized persons (including nuns!).

It can be seen immediately that with prevailing attitudes toward women, few unpaid family workers will be counted as economically active. It is easier to leave them in the "free labor" category of "economically inactive homemaker." Whether a woman's products find their way into the market is considered a critical test, but in fact there are probably very few women in any Third World country who do not produce some food, craft, or service for exchange in their own community. Many sell for cash from their own courtyard without ever entering a market. A particularly troublesome exclusion is the productive labor of those under fifteen (and, frequently, of those over sixty-five). Children enter the labor force as early as five, are regularly active by the age of ten in many countries, and continue in the labor force until they die. Even with present enumeration standards working to prevent the counting of those under fifteen, a few countries do report it. Tanzania reports 6.6 per cent of its

females under fifteen in the labor force. Thailand reports 11.7 per cent (United Nations, 1975 Yearbook of Labour Statistics; Table 1). Given that in almost all rural areas girls carry water and fuel for the household, work in the fields, tend younger children, and frequently work as hired labor in neighbors' fields or as domestic servants, girls under fifteen at the very least should be counted, if only in that strange census category "economically inactive homemaker."

Policy makers are thus laboring under an illusion as to the size of the actual market-oriented labor force when they use their own national statistics. Even more serious is the use of the concept of inactive homemaker. The value in the subsistence sector of the food women produce and process for family consumption, of the breast milk they furnish their babies, of the water and fuel they haul long distances for family use, of the craft work and construction work they do in producing home equipment and the homes themselves, and of the services they render to men, children, and the elderly in the home is not included in the national accounting system. Even valued at the rate of the alternative wages these women could command as paid laborers, which is miniscule, the fifteen-hour or more work days of the "economically inactive" would probably contribute up to one quarter of the GNP, even in the least industrialized countries. The whole issue of placing that kind of alternative wage value on what women do for domestic maintenance, even allowing for the diseconomies of time spent in hauling water and wood, ought to be reconsidered, since the

values assigned are an artifact of the type of economic analysis made. In the basic needs approach to be discussed in the next section, we will see that a large proportion of basic human needs are met by precisely these home-based activities, and they should be appropriately valued much higher in market equivalence.

Women "Unaccounted For"

The most serious lack of all in the statistics regarding the labor of women, however, is that a large number of women simply are not accounted for at all. Table 2 gives the world means for crude labor-force participation and economically inactive homemakers, by region. While means cannot be expected to add up to 100 per cent, and therefore the line "unaccounted-for women" is not a mathematically correct statement, nevertheless the magnitude of the difference between the total of accounted-for women and 100 per cent suggests that there is considerable slippage here.[2] Europe and North America, which have the best enumeration procedures, also have the least slippage. It is not possible that up to 41 per cent of the women in North Africa and the Middle East belong, as table 2 indicates, in the formally excluded categories of students, retired persons, those totally dependent, and those institutionalized. In general, it is a good rule to follow in estimating de facto, as contrasted with de jure, employment in subsistence economies to consider that all persons ten and over, both male and female, are "at work" -- in the sense that they are regularly engaged in some activity that helps keep them alive. It is recognized that only the middle classes can "afford" unemployment, because only in the middle class is there a support system that allows people to choose

[2] Another problem with the mathematics is that 124 countries report labor force rates, but only 34 countries report economically inactive homemakers, so the means are based on widely different N's. Lacking time to recompute the original data, I offer these discrepancies as worthy of further investigation.

leisure in the absence of the type of work they prefer. What planners need to know -- but do not know -- is what types of activities the 67 per cent seriously poor and the 39 per cent destitute in the Third World are engaging in to keep themselves alive. Of this economic activity, very little is known. The majority of those estimated to be seriously poor and destitute in the Third World, as shown in table 3, will be women and children, precisely those elements of the population we know the least about in terms of actual productive activities. Not only are all subsistence-sector women at work, whether counted or not, but they usually work longer hours than men, because they have domestic duties (childcare and food preparation) on top of work in the field, and transport of fuel, water, and market goods. What information we have about their activities comes from local time budget studies, mostly in African communities. From an official point of view, this labor does not exist.

Table 2. Regional and World Means for Crude Labor-Force Participation Rates of Women, and for Economically Inactive Homemakers

Labor Force Category	Europe/ North America	Latin America	Africa	North Africa/ Middle East	Asia	World Mean
Crude Labor-orce Participation Rate	.30	.17	.33	.11	.23	.24
Economically Inactive Homemakers	.53	.46	.39	.48	.51	.49
Unaccounted-for Women	.17	.37	.28	.41	.26	.27

Source: Boulding, et al., 1976: 29,33.

Table 3. Estimated Numbers of People in Developing Market Economies Living in Poverty, 1972

Region	Total Population	Seriously Poor	Destitute	Seriously Poor	Destitute
		(millions of people)		(percentage of population)	
Asia	1196	853	499	71	42
Africa	345	239	134	69	39
Latin America	274	118	73	43	27
Total[1]	1815	1210	706	67	39

[1] Excluding developing countries in Europe and Oceania, with a total population of about 25 million.

Source: International Labour Office, 1977:22.

These data pose even more problems for the international planner and the researcher interested in comparative studies than they do for the national planner, because enumeration practices vary from country to country. Table 4 indicates the officially reported deviations in enumeration practices; we can be sure there are many deviations not officially reported. Forty-six out of the 124 countries reporting labor-force participation rates of women officially acknowledge that their data deviate from United Nations recommended practices because they exclude one or more of the following categories: unpaid family workers, the unemployed, first-job seekers, women in the armed forces, nomads (who may comprise from 10 to 60 per cent of the population), aborigines, and "others." The two most serious exclusions are unpaid family workers and nomads, among whom women are 100 per cent "economically active" (See Boulding, 1977:ch. two.)

Table 4. Populations Excluded from the Enumeration of Crude Labor Force Participation of Women, As Officially Reported by National Governments

Population Categories Reported as Excluded	Number of Governments Reporting Exclusion, By Region				
	Europe/ North America	Latin America	Africa	North Africa/ Middle East	Asia
Unpaid family helpers in agriculture	1	--	--	3	--
Unemployed or seeking first job	6	3	2	--	3
Women in armed forces	3	1	1	2	3
Nomads, aborigines, "other uncounted"	2	6	2	4	4
Total Exclusions	12	10	5	9	10

Source: Boulding et al., 1976: 300-302.

The list of excluded categories in table 4 throws light on the discrepancies in accounted-for women in table 2, and highlights even more dramatically how national income accounts fail to take account of significant sources of national productivity. For it is not only the unpaid family workers and the nomadic women who are important to the GNP, but also the unemployed and first-job seekers who are active in household production while seeking work. Social role expectations may permit male job seekers to be idle, but it does not permit women to be

idle. As time-budget studies for all countries show, unemployed women's housework expands to fill available time (Szalai, 1972; Rianday, 1976; Robinson, 1977). We simply do not know what the productivity of this kind of work in the interstitial spaces of society is.

Out-of-Date Data

Not only are large numbers of women excluded from enumeration, but relatively few reporting countries have up-to-date and complete census information on their women workers. The target date used in compiling all available United Nations data on women for the Handbook of International Data on Women (Boulding et al., 1976) was 1968, allowing a span of years from 1966 to 1970, because these were the dates for which the country data were given in the 1972 yearbooks available when the international women's data project was started in 1974. Because of the slowness of European and North American countries in processing decennial census data, however, many of these countries as well as many Third-World countries only had pre-1966 data available. It will be seen from table 5 that 86 of the 124 countries reporting labor-force participation of women, or 70 per cent, provided pre-1966 data for the 1972 United Nations Yearbooks. Twenty-one countries provided "official estimates" (educated guesses), and 24 provided data from sample surveys. The cumulative distortion of data on women's participation due to initial undercounting stemming from unconscious biases, deliberate exclusion of certain female populations, the

"out-of-dateness" of the figures by the time the United Nations reports them, and the use of estimates and samples rather than complete census information by many countries, could almost lead one to conclude that the figures are valueless. The figures certainly cannot be taken at face value, and must be used in each country case with careful attention to the stated limitations of the figures, as well as with mental adjustments in the light of other knowledge about a given society and the activities of women in it. As a basis for policy planning by national governments, they are seriously misleading. However, when used in international comparative analysis they can, when used with enough caution, throw some light on overall trends in the participation of women -- at least in the modernized sectors.

Table 5. Data Variations, By Technique of Enumeration and Date of Enumeration, for Geographic Regions

Variations	Number of Countries Reporting Variations					
	Europe/ North America	Latin America	Africa	North Africa/ Middle East	Asia	Totals
I. Data from other than full census enumeration						
A. Official Estimates	7	3	7	3	1	21
B. Sample of Census	6	9	3	2	4	24
II. Only pre-1966 data available (1950-1965)	17	22	20	14	13	86

Source: Boulding et al., 1976: 303-304.

National Data on Women

What are national governments most likely to enumerate about women in their societies, if they are enumerating anything at all? Table 6 shows that out of a total of 159 countries and territories used in the data base, only 124 do even the most basic counting of labor-force-participation rates of women. The most frequently counted labor-force categories are, in order, 1) transport, storage, and communication; 2) service (domestic and other); 3) agriculture; 4) commerce; and 5) construction.[3] (All of these activities are traditional for women in the Third World, and women have continued to be involved even as the activities have become modernized.) Reporting by other occupations and statuses will be found for between 87 and 100 reporting countries, indicating a general acceptance of the value of having the data available. The exception is the category "economically inactive homemaker." Only 34 countries report this category, evidence that is not considered to be important information. The most important information about women, judging from the number of countries that collect it, is how long they will live. Figures on school enrollment of women of women and child/women ratios are the next most widely collected data. It appears that planners place a high importance on keeping track of the adult childbearing population and of the education of future childbearers.

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3 In subsistence societies women do the bulk of the construction of domestic shelter. In the industrializing sector of Third-World countries, they appear as unskilled construction workers, although in the villages they may build roads, bridges, schools, and community buildings.

Table 6. Country Coverage for Indicators of Women's Labor-Force Participation (Based on a Total of 159 Countries and Territories)

	Number of Countries Reporting
I. Labor-force Participation	
A. Crude labor-force participation	124
B. By Industry	
Agriculture	107
Mining	96
Manufacturing	98
Electrical and other	93
Construction	101
Commerce	106
Transport, storage and communication	125
Service	108
C. By Occupation	
Professional and technical work	98
Administrative and managerial work	87
Clerical work	87
Sales work	98
D. By Status	
Self-employed	95
Employee	100
Unpaid family worker	94
E. Economically inactive homemaker	34
II. Education	
Literacy	94
Student enrollment, first level	137
Student enrollment, second level	132
Student enrollment, third level	86
III. Marital Status, Life Expectancy, and Reproduction	
Marital status	94
Life expectancy	141
Fertility rate	115
Child/Woman ratio	120

Source: Boulding et al., 1976, Appendix A.

The figures collected by governments reflect 1) a desire to utilize women's production and reproduction skills for national development, 2) a very weak data collection process, and 3) the totally unreal image of production processes held by government planners. As has been amply documented in other studies on women's roles in developing countries (Boserup, 1970; Tinker and Bo Bramsen, 1976; Elliott et al., 1977; Boulding, 1977; and others), it is the productive work of both the counted and the uncounted women in the least valued and least well-equipped sectors of the labor force that makes it possible for the cash-crop agricultural sector and the industrial sector of Third-World countries to make any showing at all in the world markets. The cash sector is a continuous drain on the subsistence sector, keeping as much as 70 per cent (table 3) of a Third-World region's population in serious poverty. In every type of productive activity, women have poorer tools and a more labor-intensive production situation than men, but still it is the kitchen gardening of women in the countryside and the trading and scavenging of women in the city that keeps families going and enables them to provide some male labor for the cash sector. Further integration of women into this capital-intensive style of development can only mean further exploitation of women. Even if more cash "trickles down" to the poor, it will barely mitigate that exploitation. Increased labor-force participation of women, given current universal expectations that women will continue to carry out domestic functions after "working hours" on an outside job, will only increase an existing workload imbalance between women and men. Better collection of existing data categories will only render women more vulnerable to that further

exploitation. "Quality of life" indicators such as life expectancy and literacy are stripped of such meaning when a human being's value is primarily measured in terms of availability to participate in the labor force.

The Basic Needs Strategy and a New Approach to Census Categories

The basic needs approach to development measures progress by the extent to which the life conditions of the poorest 40 per cent are improved, even at the cost of slowing growth as conventionally measured by GNP. The International Labor Office defines basic needs as:

> . . .the minimum standard of living which a society should set for the poorest groups of its people. The satisfaction of basic needs means meeting the minimum requirements of a family for personal consumption: food, shelter, clothing; it implies access to essential services, such as safe drinking water, sanitation, transport, health and education; it implies that each person available for and willing to work should have an adequately remunerated job. It should further imply the satisfaction of needs of a more qualitative nature: a healthy, humane and satisfying environment, and popular participation in the making of decisions that affect the lives and livelihood of the people and individual freedoms (International Labour Office, 1977:7).

It will be noted that many basic needs do not enter into the GNP of Third-World countries, because the activities that produce them are not part of the market sector and are done by women; such activities include the provision of food, shelter, clothing, water, fuel, transport of goods and children, health care,[4] and education in

[4] The failure to estimate the amount of health and nursing care provided by women to their families is one major source of bias in estimating national product.

agriculture and handicraft skills; the creation of domestic space in which each person is to some degree an individual and individual desires (those of males more than females) are taken into account[5]; the provision of nurturance and leisure opportunities; the preparation of feasts and celebrations.

Since these are the activities which provide the basic human satisfactions, as well as basic human needs, I suggest that it is necessary to begin collecting data on these need-satisfaction activities, so that they can take their place in national income accounts along with market-based activities. They might well be assigned higher values than market activities. There is a three-fold reason for collecting data on these activities:

1) Such data render visible and assign public value to basic dimensions of human welfare now largely hidden by market-based development measures, and thus give more status to the activities that women traditionally carry out. They cover activities of women in the poorest sectors, both women living with male heads of household and women who head households; they cover unpaid family labor and the economically inactive as well as the employed.

2) The attention focused on such activities will make visible the imbalances between women's and men's work loads facilitating a social dialogue on the redistribution of work, or on alternative roles for women and men, and on the provision of better tools at the domestic level to meet family needs.

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[5] With all the emphasis on participatory roles in developing societies it is rarely noticed that the family is the primary setting in which participatory roles are possible. Even when family relations are relatively authoritarian, some shaping of the environment is possible for each person within the household environment.

3) Enumerating valued human activities may encourage an increase in the quality of certain kinds of participation in a society as it becomes known through the enumeration process that these things are indeed valued. The process of enumeration is in itself a value statement, and therefore a potential tool for social change.

The Unpaid Family Worker

In order to avoid excluding unpaid female workers from the data, an initial assumption must be that all household members over ten years of age are "working." The problem is how to categorize their activity. The census taker should be instructed to enter each household member over ten in the "home production worker" category, if no other category applies. The category "economically inactive homemaker" disappears. If a family member is an unpaid worker for a household cash-producing enterprise, then the already existing category "unpaid worker" should be used. Many women in near-subsistence economies will be listed as having two occupations: unpaid family worker and home production worker. In agricultural areas, wherever a man is categorized as an agricultural worker, then the women members of that household are probably also agricultural workers, whether listed as such or not.[6] (Where men are landless agricultural laborers, this does not necessarily apply. And in some strict purdah societies of North Africa this may not always be true.) In both rural and urban

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6 A current exploratory study of farm women in the southwest United States suggests that middle-class farm housewives put substantial hours daily into farm work all year long, including work in the fields. At peak work seasons they put in very long hours indeed. Yet these women are classified by the census as housewives only (Boulding study in process).

areas, women spend a considerable amount of time in domestic craft production and in trade -- cash, barter, or both. Women who trade for cash should be listed as traders as well as home production workers. To cover the full range of activities of the homemaker, I suggest the following occupational categories be added to existing census categories:

Home Production Worker (check which subcategories apply):
- Home craft production (articles produced for family use)
- Home agriculture (raising food for family consumption)
- Home services (cooking, childcare, health care, home maintenance)
- Home-based barter (articles exchanged with others outside the household, not for cash)

A home production worker can be categorized as involved in home production either full time or part time, depending on whether there is other market employment. The worker can be of any age, either sex, and of any social class. In urban settings, middle-class homemakers may only be described as producing home services in their role of home production worker. In the impoverished urban sector, homemakers may well be included in all four categories, particularly if they have been able to find a small piece of unused land in the city (not uncommon but also sometimes illegal, so reporting this may be a problem). In the rural subsistence sector, women will certainly be included in all four categories. By aggregating national statistics on these four subcategories of the home production worker and seeing how many women have additional employment in the market economy, a

different image of the role of women will develop. (Women's extra jobs might be called sunlighting rather than moonlighting.) As more men begin reporting home production work, a different image of gender differentiation may also develop. It is very important that women who act as de facto heads of household, whether or not a husband is occasionally present (as with migrant workers), be reported as such in connection with home production. A woman head of household who is a full-time home producer with no cash income is ordinarily in serious poverty.

Land Ownership and/or Use Rights, Membership in Cooperatives or Credit Associations

Because lack of access to land and capital compound rural women's dependent situation in many Third World countries, reporting rights to land and access to capital by enumerating memberships in cooperatives and credit associations by sex would be a way to legitimate such access for women, as well as for men, in the subsistence sector. There is considerable evidence available now that women will use innovative agricultural practices, and will take some risks in doing so, if they have the necessary resources (Skjönsberg, 1977). Access to land and credit are among the major resources they need.

Health Care Specialists

Health is one of the most discussed and least effectively acted on issues in Third World development planning. It is a prime factor in determining the quality of life, but city-based planners tend to

see (more often than not, incorrectly) most local health care practices as dangerous. Planners are beginning to acknowledge and work with practitioners of traditional folk medicine and traditional midwives in Third World countries, but the process is slow. The training of nurses to function autonomously in rural areas in cooperation with traditional practitioners, and the training of paramedic "barefoot doctors" is also growing--again, slowly. These developments would be much strengthened if the total number of non-doctor health care specialists, both traditional and modern, were enumerated and reported in United Nations Yearbooks, just as the number of teachers at first, second, and third educational levels are now reported. The position of women already in this field or attracted to it would be enhanced, and the information flow between traditional and modern practices would be reinforced.

There is a strong reason for beginning to list nurses and modern and traditional paramedical personnel in the general statistical yearbooks. (Presumably some of this information is to be found in World Health Organization Yearbooks, but is not seen by general users of United Nations statistics.) The costliness of hospital-based care and its irrelevance to the health of a total population is now producing new role definitions for nurses in the West (Musallem, 1969). Community health practitioner-nurses are beginning to replace the general practitioner, who then tends to become a hospital-based specialist. This movement is reenforced by reports that the presence

of nurses in a community is positively correlated with the health of that community, but the presence of doctors is not (Behavior Today, March 1978).

In the future, the community nurse may come to play an even more important role than the school teacher in community development. The nurse, like the traditional folk practitioner, interacts with individuals in family settings, and can assist with a variety of problems at each level -- individual, family, and community. Wherever interaction between folk and modern health practitioners takes place, it apparently upgrades the skills of both. The vexatious issue of changing traditional food taboos that keep necessary protein from pregnant and lactating women, for instance, can probably best be handled by an alliance of folk practitioners and nurses, once the folk practitioners understand the problem. Plans to upgrade the nutritional level of families in the poverty sector through food distribution programs, even if they involve special-purpose and specially labelled foods for women and children, cannot in the long run be as effective or as economical as changes in attitudes and practices of family food sharing that could be brought about by the respected traditional healing figures of a community. Such a change would require active involvement of nurses trained to work with folk practitioners.

The act of enumeration and publishing as frequently as possible the number of nurses and folk practitioners available in a country will both legitimate a viable and still somewhat new approach to public health, and attract more women (and men) into the field of

nursing. The status of women will be aided by the expanded vocational opportunity and by the improved self-help health and nutrition practices that the emphasis on village teams of nurses/folk health practitioners will make possible.

Community Extension Workers

It would also be valuable to have a separate tabulation of community extension workers. At the moment most of them are men, but the social mirroring which the reporting process triggered would make it easier to increase the number of women extension workers. Presently men are agricultural specialists and women who are in the field at all are nutrition specialists. A shift to giving combined agricultural-nutritional training to all extension agents of either sex would break down the unrealistic program differentiation that denies to men the nutritional information they need and to women the agricultural information they need. This would also provide an additional approach to breaking down traditional food taboos, for male extension workers could insert conversation about nutrition into their interaction with male farmers. At the same time, the increase in women extension workers with a broad agricultural-nutrition training means women would get needed help with their farming problems. Post-harvest food loss, a major source of food shortages, can best be dealt with by a two-pronged attack by male and female extension agents on men and women farmers, since both men and women are responsible for certain key aspects of the food storage process. At present in most Third World countries, men's and women's meetings with extension agents are held at separate

times and places, so only by giving broad training to workers of both sexes can a wholistic approach to agriculture, food processing, and nutrition be achieved.

Civic Participation

One way to encourage the participation of women, men, and children in civic activities outside the home would be to collect census data on the number of organizations -- civic, religious, political, cultural, and economic -- that each person belongs to. However, collection of such data involves a tricky privacy issue, and in totalitarian societies such information could be used against individuals, so this suggestion is made more to encourage long-range thinking about developing norms of civic participation than to advocate immediate action.

Family Violence

No country at present collects statistics on family violence -- wife abuse, husband abuse, child abuse. There is, however, growing awareness of the seriousness of this problem in all parts of the world, at all levels of industrialization. Women and children are the chief, although not the only, sufferers. Unfortunately, the practice of beating a woman because a meal is not served when wanted, or beating a child for less than instantaneous compliance with a command, is a problem associated with longstanding practices of age and sex discrimination that cut across cultures and economic systems. I do not think it is practical at this time to try to collect United Nations statistics on the subject -- they simply could not be collected -- but it is worth thinking about what data could be collected that would

give indications of trends in the practice of physical violence in the home. The home is, after all, an important training ground, and acceptance of violence there leads to violence elsewhere.

Disaggregation: The Individual Behind Measures of Well-Being

The Use of Time Budgets

All the indicators suggested in the previous section were chosen on the basis that the data could be collected from individual households in census enumerations, and that the categories would lend themselves well to cross-national comparisons as well as to socially useful national reporting. Even if these indicators were used, however, the problem of assessing the situation of women in poverty in national aggregate data would remain. Each of the indicators was suggested on the grounds that it would reveal more of the content of economic and social well-being for women, as well as men, than is revealed by current market and demographic indicators, but in most countries the reporting infrastructure itself is inadequate, which means that it is not feasible to report on well-being by income groups. So questions about the situation of women in poverty will still be unanswered.

The best methodology presently available for discovering the reality of experienced welfare levels behind aggregate statistics is the time-budget study. It has been remarked that time may be the most attractive social indicator "when we have no obvious direct measurement for a social concern" (Tunstall quoted in Robinson, 1977:24). Everyone has the same twenty-four hours in a day. How those twenty-four

hours are distributed for different kinds of work, leisure, and rest tells us very quickly how one set of people are doing compared with another. The technology for international time-budget surveys has now been well developed, as a result of Szalai's pioneering work for the UNESCO time budget study, and many follow-up studies since. It has been noted in all time-budget studies that gender is associated with greater differences in time use than almost any other variable, and that women work longer hours and sleep less (particularly if they are also employed outside the home) than men. Time-budget studies would therefore be an excellent way to monitor the work-load imbalance that reduces the quality of life for so many of the world's women. They would also provide feedback on the choices that different social sectors make with regard to discretionary time, and would thus provide the basis for a society's self-evaluation.

I began this paper by emphasizing that statistics serve planning purposes and that these planning purposes may disregard human well-being. Integrating women into a mechanistically conceived development process continues the manipulation and exploitation that women have experienced for so long. By using the basic human needs framework, and by emphasizing the importance of the household[7] in meeting those needs, I have shifted the development focus from an exclusively economic one to one that highlights less noticed aspects of economic and social life. The basic needs strategy makes possible a more humanly grounded image

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[7] The emphasis on the household in this paper has not been meant to exclude the single woman, but rather to focus on that majority of women, with or without partners, who have household responsibilities in the Third World.

of society and a more humane set of social purposes. In proposing basic needs-related indicators, I have emphasized the potential of indicators as a tool for social change, particularly for breaking down rigid gender role differentiation. It would be naive to believe that social justice could be achieved through the use of indicators alone. In fact, some of the indicators suggested here may not be accepted as legitimate subjects for enumeration for a long time. Other political processes will bring about social change before the official indicators themselves change. The creation of indicators is also a political act, however, and the suggestions made here will find their place in the larger political process. They offer a mirror for those societies that are ready to look and see how they are doing.

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Interhousehold Cooperation As An Adaptive Strategy of Poor Women: An Illustration of the Uses of the Human Relations Area Files Cultural Information System

Hesung Chun Koh
Terri L. Stangl
Human Relations Area Files
Yale University

As the title implies, this paper has two purposes: 1) to describe the Human Relations Area Files (HRAF) and illustrate their usefulness for doing research on the socioeconomic participation of women; and 2) to explore the ways in which the study of cooperation among poor women can contribute to a better understanding of the importance of their socioeconomic activity. In order to explain HRAF, we first discuss in great detail the research method used in studying interhousehold cooperation among women, demonstrating how we used different components of the HRAF Cultural Information system (HACIS) and why. The second section then discusses our findings in terms of whether the unit of analysis for measuring women's socioeconomic participation should be women's networks rather than households. In the conclusion, HRAF resources are evaluated in terms of their usefulness as a data base and research tool for understanding the contributions and problems of women in poverty.

Note: We would like to thank Eleanor C. Swanson, Timothy J. O'Leary, Robert O. Lagacé, Barbara Von Elm and Candice Farnell for their kind assistance and suggestions in the preparation of this article.

Research Method: Utilizing the Human Relations Area Files Cultural Information System (HACIS)

The purpose of the Human Relations Area Files, Inc. (HRAF) is to develop programs and services to encourage and facilitate the worldwide comparative study of human behavior. There are three information subsystems within the HRAF Cultural Information System (HACIS). The first is the data archive and retrieval system known as the HRAF Files. Founded in 1937, this system is a continually expanding collection of descriptive data on a large sample of cultures, or societies, representing all major areas of the world. The data are drawn from published and unpublished books and articles, including many rare documents. English translations of foreign texts are prepared especially for the Files (see Lagacé 1974).

The second subsystem, the HRAF Automated Bibliographic System (HABS), was begun in 1965. It is designed to deal with many of the methodological and research problems encountered in documentary research in the human sciences and especially in comparative cultural studies. Its multidimensional and multilevel approach to data analysis, together with data quality control factors, aids the user in locating documents that are relevant, comparable to each other, and above all, trustworthy (see Koh 1966, 1973 and 1978).

The third subsystem, the Theoretical Information Control System (THINCS), begun in 1973, is a computerized research tool for compiling theoretical propositions and describing the methods used in deriving or testing these propositions. It applies, with modification, the HABS information principles, analysis design, and computer programs to the handling of theoretical propositions rather than to a bibliography. With this system, propositional inventories on almost any topic from alcoholism to sex roles can be compiled. THINCS also provides ways in which researchers can systematically and

objectively assess whether a theoretical proposition has been adequately tested (see Levinson, 1978).

All three information subsystems use a common cultural unit classification system called the "Outline of World Cultures" (OWC) and a subject classification system called the "Outline of Cultural Materials" (OCM) (Murdock, 1975 and 1971). The OWC contains an inventory and classification of the known cultures of the world, while the OCM presents a comprehensive subject classification pertaining to all aspects of human behavior, including social life, beliefs, customs, material culture, and environment.

In order to use HACIS to research women's socioeconomic roles and status among the poor, it was first necessary to translate the research problems into terms that fit OCM subject categories. To accomplish this, a preliminary list was compiled of all OCM categories that might provide data on women's socioeconomic participation--both within and outside the home. By examining the data in a few files, we were able to determine that "division of labor by sex," "sex status," and "daily routine" would be the most useful OCM categories for our purposes.

We then selected cultures from HRAF's 60 Culture Probability Sample Files (PSF), which is a stratified random sample.[1] In selecting the four cultures used in this study--Korean, Lapp, Tzeltal, and Hausa--the following six factors were considered: 1) availability of an adequate amount of information on women's socioeconomic participation; 2) representation of cultural regions of the world; 3) focus on the community as the sociocultural unit of analysis; 4) availability of at least two ethnographies based on field work by trained social scientists: 5) comparability of time period covered, and 6) historical depth of at least 100 years.

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[1] For a discussion of the sampling methodology, see Naroll, Michik and Naroll, 1976.

In making our selection, we had to determine which cultures had an adequate amount of information in the OCM categories previously determined to be the most useful (e.g.,"sex status," division of labor by sex") and to ensure comparability of both communities and cultures.[2] By checking the listing under each subject category, we were able to obtain more specific information about the available studies of each culture--country, location, names of specific communities studied,and the nature of the observed units (i.e. community, district, state, etc.) We also noted the field dates and the year of publication. At this point, the HABS analysis method was used to put together a table showing all the information available for each culture. Using the table, we could check to make sure that adequate data was available on each culture and that the studies were roughly comparable.

Finally, we had to minimize systematic bias and check the trustworthiness of the sources. In order to do this, we checked the author's background as well as the research design and the methodology of each study. The methodological variables include: 1) whether systematic observation techniques were used in collecting data; 2) the familiarity of the principal investigator with the language spoken by the people being studied; 3) the length of time the author spend in the field collecting data; and 4) whether there was a time lag between the investigator's earliest field data and the beginning date of coverage.[3]

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[2] To determine which cultures had adequate information, we scanned the appropriate OCM categories in the Index to the Human Relations Area Files, and the Supplement (1978). To ensure comparability of communities and cultures, the "Culture and File Orientation" and"Bibliography Slip" categories of the Files were used. For a more extensive guide to the cultures, there is Sixty Cultures: A Guide to the HRAF Probability Sample Files. (Lagacé, 1977).

[3] These pieces of information were compiled from "Bibliography Slips", the HRAF Source Bibliography: Cumulative, and "Data Quality Control and Unit Focus Data" (Perkins, 1976), according to the HABS analysis method (see Koh, 1966: 158-159; Naroll, 1973: 935-38; and Koh, 1978).

Cooperative Networks in Four Cultures

A preliminary examination of the literature on adaptive strategies of migrants, ethnic minorities, and the poor points to the significance of their use of social networks and cooperation as mechanisms for mobilizing and distributing scarce resources, whether labor, capital or information. Several of these works deal specifically with women's networks.

Carol Stack, in her study of urban Blacks in the United States, notes that the traditional concepts of nuclear and matrifocal families do not adequately account for the numerous network relationships between households. She observes that:

> When economic resources are greatly limited, people need help from as many others as possible. This requires expanding their kin networks...increasing the number of people they hope to be able to count on. Women continually activate these lines to bring kin and friends into the network of exchange and obligations...These networks have evolved patterns of co-residence; elastic household boundaries, lifelong, if intermittent, bonds to three generation households (Stack, 1974:128).

Stack contends that kin-based cooperative networks result from the collective adjustments to poverty of men, women, and children within the Black community. She suggests that in studying the poor, the network rather than the individual household is a more meaningful unit of analysis. In a similar vein, Estellie Smith, in her study of Portuguese immigrants in New England City, demonstrates that the formation of new networks is critical to the process of adjusting to a new setting. She states also that women play a significant role in the formation of new networks (Smith, 1976: 20-21).

Yanagisako, in her recent study of the Japanese-American community of Seattle, Washington, stresses the point that a woman's participation in an interhousehold cooperative network significantly affects her husband's and her family's social status, its access to economic resources such as jobs, capital, or housing, and its access to political power. Because of the central position women hold in social networks, women also play an important part in the social, political, and economic interaction of the community as a whole (Yanagisako, 1977: 222).

We decided to study the question of interhousehold cooperation by comparing four cultures, the selection of which has already been described. They are Rural Koreans of South Korea, the Lapps of Northern Sweden and Norway, the Tzeltal Indians of Mexico, and the Hausa of Northern Nigeria. We chose at least two communities from each culture using the methodology outlined above. The two Tzeltal communities were Aquacatenango, an agricultural community, and Amentenango, where agricultural production is combined with pottery-making. For the Lapps, the nomadic reindeer herders of Lainiovuoma, Sweden and the migratory fishing/agricultural community of Revsbotn in Norway were selected. Sam Jŏng Dong, an agricultural village, and "Sŏkp'o" (fictious name), a fishing and farming village were chosen from South Korea. The two remaining communities for our study were a Hausa village in the Zaria province and the village of Batagarawa near the Niger border. Both Hausa communities combine subsistance agriculture with subsidiary craft occupations.

We looked at the data on each community to determine the cooperative activities of poor women and men as they occured either within or outside the household. First, we inquired with whom women cooperated when doing what kind of work and under what conditions. Second, we were interested in whether women and men cooperated across generational and age lines.

Networks Mobilized by Women for Cooperation and Survival

We found that in all four cultures women actively cooperated with both kin and nonkin neighbors, when working for their own households. Although work was usually divided along age lines within each sex group, cooperation was evident both between generations and across age groups, including children as well as the aged. Women were more active than men in establishing networks of kin and neighbors. Many of these networks were primarily social in nature, but they also served such economic functions as raising capital, mobilizing labor, and creating employment opportunities. The communities where women cooperated most actively with each other, namely the Hausa villages and the Tzeltal community of Amantenango, are also the very villages where women had the highest status and economic independence.

The relationship between the status of women and their productivity is particularly striking when the two Tzeltal villages are compared. Aqaucatenango, a farming community with a small labor force and almost no alternative sources of income, is poorer than Amantenango . Its women are economically dependent upon men and are considered by men to be economic burdens. Women in this village also have little decision-making power beyond the control of food consumption. In contrast,

women of Amantenango make pots, which bring in a large part of the family income. Among poor households in Amantenango, women account for up to 90 percent of the family income. Thus, these women are economically independent and share with men the responsibility for supporting their families.

Pottery production is carried out through close cooperation among women, children, and elderly within and between households. The pooling of labor permits the use of a variety of skills and an efficient division of labor, thereby improving the overall rate of production. Workers are organized on the basis of age and skill. While older women work on their pottery, children and adolescents are held responsible for other housekeeping tasks, running errands between households, and making deliveries. Pottery is molded within each household, but the gathering of clay and firing of pots are carried out cooperatively by the neighborhood. According to Hunt, "Most steps in the production of pots are arranged in a 'assembly line' style, with the women distributing their individual work according to the needs of the steps of the productive activity" (Hunt, 1962:80). Some steps, such as firing, require close and alert attention; cooperation is thus highly desirable to ensure successful results.

Specialization and interhousehold cooperation are also found among the Muslim Hausa women, even though they live in seclusion. For example, a woman who makes ground nut oil may send a child or an elderly woman to purchase ground nuts from one woman trader, to buy a midday snack from another, or to buy clothing, grains, or small luxury items from still others. In the village of Batagarawa, some two thirds of the women are involved in interhousehold trade. Thus, the majority of these Hausa

households are economically interdependent, and this interdependence all each woman to optimize her earnings by allocating most of her time to he particular specialty.

The networks that women establish may be further used to both maxim the amount of available capital or the utilization of it. One way Hausa women maximize the use of available capital is by establishing a wide network of biki (gift-giving) partners, often as many as twenty. These partners may be in many different households and villages, for Hausa women are frequently divorced and remarried. Biki literally means "an insurance," and indeed Hausa women count on biki to insure the availability of the capital required for the large ceremonial expenses of marr and naming, for special divorce expenses, and/or for visits to their families (Michael Smith, 1955: 55).

In an adashi (cooperative savings group), Hausa women pool their money in a joint fund, which each member then receives in turn. The adashi enables women to have larger sums of capital than is otherwise possible. With this money, a woman may purchase capital goods such as tools, raw materials, etc., for her household to use in economic production (Michael Smith, 1957: 9).

Hausa women have also organized to provide a form of unemployment assistance; they have established a cooperative to house and employ as temporary prostitutes poor women who are single and strangers (baki) to the area, as well as divorced women who are between marriages. One woman is in charge of the cooperative and sees to the welfare of its members (Michael Smith, 1957).

As in many Korean villages, the women of Sam Jŏng Dong belong to one or more cooperative groups called ke. Ke, an indigenous mutual aid cooperative, is an institution of 10 to 12 people formed for a specific task of raising a sum of money. It has been a popular form of cooperation among Korean women of the past as well as of the present, and among the urban educated as well as the rural poor. The leader of a Ke has to be trusted by all of its members. She also has to know the procedural rules and practices, such as the rate and terms of payment and share collection, particularly since the leader has the privilege of using the jointly gathered capital first. There are generally two types of ke: the first collects a small sum of money from all members for investment. After a specified time, each member's share is returned with a percentage of the total interest acrued. The second type of ke requires a monthly payment and enables women to borrow a large sum of money for personal use during a period of time determined by prior lottery (Knez, 1960). The ke is particularly important to Korean women, both poor and wealthy, for they cannot obtain or use large sums of money unless they belong to one.

The establishment of networks further enables poor women to pool their skills and mobilize a large labor force. Farming Lapps and the agricultural villagers of Korea form cooperative work groups for such farming tasks as ploughing, sowing, and harvesting (Paine, 1957; Brandt, 1971). The women in Sŏkp'o contribute to their economy by gathering oysters. This activity is usually done on a neighborhood basis, but different neighborhoods may frequent adjacent locations, enabling women to exchange information, assistance and friendship across the entire village (Brandt, 1971).

In the Lapp village of Lainiovuoma women cooperate through the sii'da, a communal herding group composed to two to six families, which is led by the man having the biggest herd of reindeer and the most experience. A sii'da may be intact only during the winter, and it is possible to change from one sii'da to another. Adult women cooperate on the interhousehold level in directing the caravan (elders, children, and belongings) during annual migrations. Older women and men advise the sii'da, repair artifacts, and instruct young people in various tasks. Men and women of all ages periodically cooperate in tasks that require the rapid work of the entire sii'da, such as marking and slaughtering the reindeer (Pehrson, 1957).

Another type of interhousehold cooperation among nomadic Lapps can be seen in the practice of godparenthood. Each child is given about six godparents and is expected to defer to them, especially in matters of moral development. Thus, some parental functions are fulfilled by men and women from outside the household (Whitaker, 1955).

Wives of the Lapp fishermen in Revsbotn actively work on interhousehold and communal projects, devising strategies for improvement, not just survival. The services of the Women's Association, such as teaching hygiene, and providing material aid in emergencies, are more important to the poor than are the services of the men's Fishing Association.

A Comparison of the Cooperative Activities of Men and Women

We have shown above that the economic contributions of poor women in four different cultures are frequently carried out through a network of social and kinship relations. We now will consider whether men also make use of the network and, if so, to what extent and for what activities.

In the Hausa villages, men alternate their agricultural activities in the rainy season with secondary craft and trade activities in the dry season. During the rainy season, men often work temporarily in a gandu, a cooperative work and residence group that is usually comprised of male kin. In addition men occasionally organize work groups of friends, neighbors, kin, and clients who exchange a day's labor for a meal provided by the host. These groups are organized to perform such tasks as land clearing and house building. Economic cooperation among men in crafts and trades during the dry season is not a common practice, because crafts and trade are secondary activities and individual households differ in their scheduling priorities. For example, an attempt to introduce two-man looms failed because the weavers were unable to coordinate weaving schedules due to differing household work schedules. Among the Coast Lapps of Revsbotn, too, annual activities such as ploughing, sowing and preparing the land are done infrequently, but cooperatively (Whitaker, 1955). Korean farmers in Sam Jŏng Dong and Sŏkp'o also cooperate occasionally when roofing or building a house, or transplanting rice (Knez, 1959), while Korean fishermen of Sŏkp'o cooperate daily, but only with a few near-by kin (Brandt, 1971).

In the village of Sŏkp'o, Korean men associate primarily with men of a similar age. This contrasts with the women of Sŏkp'o who actively socialize and cooperate with women of all ages when oystering, washing, gardening, or doing housework (Brandt, 1971). These Korean women have thus laid the social groundwork for broad cooperative networks and have done so more extensively than men.

In all four cultures, men are found to cooperate in important ways, but male cooperative networks are often smaller in scope and more limited in the number of participants than those of women. The types of cooperation among both men and women are conditioned by the prevailing mode of production. Often it appears that males' time, opportunities, or needs for cooperative interactions are limited. Women, on the other hand, appear to depend more heavily than men on cooperative networks for financial security and regularly recurring needs.

A Comparison of the Cooperative Activities Within and Between Households

Typical examples of household activities of poor women are housework, cooking, sewing, and feeding household livestock. Usually these chores must be done regularly and on the premises of each household, so interhousehold cooperation is impractical and inefficient. Childcare is often a cooperative effort, shared by the members of a single household or, sometime by members of different households.

In the pottery-making village of Amantenango, cooperation takes place within the household until the pottery is ready to be fired, when other assistance is necessary in order to optimize production. The trade goods of Hausa women (ground nut oil, snacks, weaving) are utilized within their secluded households, but actual trading, biki (gift-giving), and adashi (savings groups) are evidence of wide networks of interhousehold dependence. Korean women of Sam Jŏng Dong work daily on an intrahousehold level on such tasks as cooking, cleaning, gardening, collecting eggs, and feeding livestock but utilize ke to supplement what minimal cash resources they have within their own households. Further, women often form work parties composed of members of different households. In the Tzeltal village of Aquacatenango, women regularly gather firewood, and in Korea's Sŏk'po,

women wash clothes and gather oysters. While each individual does her own work, these work parties are highly valued by women for the opportunities for social interaction they afford (Hunt, 1962; Brandt, 1971).

We have thus begun to identify a continuum of women's activities within and among households. The former serve the immediate and localized demands of the household; the latter enhance social relationships and increase household access to scarce resources, capital, and labor.

Table 1 summarizes the data on inter- and intra-household cooperation in the four cultures we have examined. It shows--as does the discussion above--that poor women, more than poor men (or wealthier women), are actively involved in creating or maintaining extensive and regular networks, not only as a way to adapt to their poverty and survive, but also as a way to change and improve their condition. Labor mobilization, work specialization, and capital sharing are among the important functions of these networks. Here we have limited our discussion to intracommunity networks, but in fact these networks may extend beyond the neighborhood and village.

This analysis leads to the conclusion that in order to measure poor women's economic contributions, it is necessary to go beyond the focus on the household and analyze the network linkages that exist between individuals of different households. We suggest that such analysis is important because it could contribute not only to a better understanding of poor people's adaptations, but also to better planning and implementation of development programs. Cooperative networks could be used for disseminating information, for instance; and programs could be better focused if their potential effects on such networks were considered. How

Table 1. Intra- and Inter-Household Cooperation Among the Sexes

(C) Done by children
(A) Done by adults
(E) Done by elderly

		TZELTAL		LAPP		KOREA		Hausa
		Aguacatenango	Amentenango	Lainiovuoma	Revsbotn	Sam Jong Dong	Sokp'o	Zaria Region & Batagarawa
INTER-HOUSEHOLD	FEMALE	gather firewood (X)	collect clay(A) firing pottery (X) errands/ deliveries(C) giving speeches (E)	Childcare(AE) socialization of female children(AE) lead caravan during migrations(A)	Women's Association (AE) (improves hygene, standard of living)	ke-(AE) (co-op savings group)	washing clothes(X) gathering oysters(X) prepare food for parties(X)	"house trading"(X) biki - gift giving(AE) adashi - co-op savings group(AE) co-op house for prostitutes(AE) go-betweens for house-traders(CE) trade: gather firewood, & water(E & un-secluded poor)
	MALE	Fence fields(X)	ploughing(X) cultivating(X) harvesting(X)	lead reindeer during migrations(X) raide(taking of stray reindeer belonging to another)(A) Socialization of male children(AE)	spread manure (X) ploughing(X) preparing land(X) sowing(X) Fisherman's Assoc.(AE) (determines fishing rules)	agricultural work(with kin, neighbors, if needed.)	fishing(X) roof thatching(X) house-building(X)	gandu(during rainy season grows & harvests crops)(X) gayya(temporary work force for housebuilding clearing land) (X) gudummuwa - gift giving, not reliable(AE) clientage - economic superior aids lower status man = (AE)
	UNDIFFER-ENTIATED	No Data	No Data	Advisory(E) repair artifacts(E) marketing & slaughtering(X)	haying(X)	marketing(X)	agricultural work groups for rice transplanting, threshing, etc.(X) run errands (C)	bear news(C) harvesting(if women not secluded)(X) cooking(X) fetching wood(X)] in gandu
INTRA-HOUSEHOLD	FEMALE	cooking(X) childcare(X) cleaning(X) feed small livestock(X) gather eggs (X) care for sm. garden(X)	make pots(AE) make meals(X) childcare(X) cooking (X) housework(X)	draw water(X) prepare food(X) gather wood(X) sewing(X)	household tasks(X) feed livestock(X) milk livestock(X) knitting on machine(X)	cook(X) clean(X) childcare(X) collect eggs(X) work in sm. garden(X) feed livestock (X)	cook(X) sew(X) household chores(X) childcare(X) care for kitchen garden(X)	sweep compounds(X) cook evening meals(X) childcare(X) provide daughters' clothes, doweries(AE) housetrading crafts(AE) small livestock(X)
	MALE	cultivate land(X) misc. agri.(X) teaching skill(X) care of livestock (X)	same as inter-household marketing pots (A) cattle care(A) milpa agri.(X)	same as inter-household	same as inter-household	same as inter-household	same as inter-household	subsidary crafts(weaving,dyes,leather,etc.) (AE)

will development programs affect the social interactions within these networks? Will they lead to a decrease in socially valued interaction? Will the economic increments be dispersed throughout the network? These few points indicate the direction that future analyses might take.

Evaluation of HACIS as a Research Tool

In this section we will discuss the strengths, as well as the limitations, of the HRAF Cultural Information System (HACIS) for measuring women's socioeconomic participation.

Information on Poor Women

The OCM Poverty category was not very useful for finding data on poor women, perhaps because this category is under the rubric Social Problems. Two other categories that we expected to use, Standard of Living and Social Stratification, were also not very helpful. Real Property, Income and Demand, and Dependency were all useful, however, and provided information on poverty.

One of the most useful aspects of HRAF Files for this study was its culture-selection policy. HRAF Files gives attention to the "primitive societies" within smaller and less developed nations from a traditional anthropological perspective. Out of 60 culture samples, only three were nation-state culture units.

Comparable Data

One major advantage of using the HRAF Files is the ease of finding comparable data on men whenever there is information on women. The unit

definition and data quality control information of the HRAF Automated Bibliographic System and HABS bibliographies on the Lapps and Korea (O'Leary and Steffens, 1975; Koh, 1968 and forthcoming) are also very helpful in selecting comparable culture units (communities of similar size during similar time periods). The OCM categories made it easier to find comparable subject information for various cultures.

Quality of Sources

The most rewarding aspect of using HRAF Files and the information system is to be able to select cultures and sources with trustworthy information. These are usually the studies with rigorous methodologies. The HABS data quality control information greatly aided us in selecting sources such as Nash (1979) and Hunt (1962) on Tzeltal, Paine (1957) on the Lapps, Brandt (1971) on Korea, and Smith (1955, 1957, 1965) on Hausa, all of which helped us in shaping our analytical concepts.

Level of Articulation in Development Studies

One advantage of using the HRAF Files was the opportunity to examine information that related households not only to the community but also to state and international levels. The fishing activities of the Coast Lapps, for example, were directly affected by the amount of government subsidy that the local community could obtain and by the regulation of fisheries. These regulations were usually set internationally and enforced by the state. In order to receive a state subsidy, the siida had to comply with state regulations, thus relinquishing its autonomy. It is one example of how

the social cost of economic development is illustrated within the HRAF Files data. By dealing with a large number of cultures of varying complexity, HRAF Files can facilitate the investigation of relationships existing between different socioeconomic units. These relationships are a crucial part of development research and of measuring women's economic performance.

Hypotheses Formulation

In the process of our research, we discovered a number of interesting correlations related to women's economic contributions among the poor. One which may prove useful in formulating new hypotheses is a positive correlation between the residential proximity of married daughters to their parents and the daughters' economic contributions.

In the Tzeltal communities, for instance, there appears to be a definite relationship between the degree of women's economic contribution and post-marital residence patterns. In Amentenango, where women make significant economic contributions through pottery making, matrilocality is the most common post-marital residence pattern (e.g., 67 percent of the married women reside with or near the wife's parents, while only 40 percent of the men remain with or near their parents). Mothers begin training daughters to become potters at about the age of 11 or 12. By the time daughters marry, they have attained considerable skills in this art and there is great pressure for them to remain near home. Among the Lapps, where males and females inherit reindeer equally, post-marital residence is bilateral. A preliminary (worldwide) examination of correlations between the status of women and post-marital residence patterns through HRAF's THINCS data base (Levinson, 1978), leads us to think that the relationship has important implications. It would be a worthwhile topic for further research.

We conclude that HRAF Files provide much cross-cultural data that can be used in studying the social and economic roles of women. No other data base contains descriptive information and historical details for more than 300 cultures, including many in less developed regions of the world. In addition, as far as we are aware, there is no other data base that is equipped with means for data retrieval combined with aids for culture unit definition and data quality control like those in the HRAF Cultural Information System. As long as we do not expect it to be the sole research tool for all types of data, it can contribute a great deal to research on women in poverty.

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The Compatibility of Childcare with Labor Force Participation and Nonmarket Activities: Preliminary Evidence from Malaysian Time Budget Data

Julie DaVanzo
The Rand Corporation

Donald Lye Poh Lee
University of Malaya

In this paper, time budget data from the Malaysian Family Life Survey are used to investigate household demand for time devoted to housework, intrahousehold allocation of time to these activities, and the compatibility of these activities and various market activities with childcare.[1] These data afford a unique opportunity to examine this last topic, for they contain information on whether children of various ages accompany the mother when she performs market and out-of-home nonmarket tasks. Among the questions addressed here are the following:

How does family size and composition and the presence of modern labor-saving devices affect the amount of housework done?

How do wages of household members affect their allocation of time to various housework tasks?

With what activities and in what settings are husbands and children most likely to help?

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[1]The research on which this paper is based was performed during a collaborative visit to The Rand Corporation by Donald L.P. Lee, Economics Department, University of Malaya, between November 1977 and January 1978. That visit was funded by the Office of Population of the Agency of International Development, under its contract with The Rand Corporation, as part of a much larger survey and research project investigating the influence of public-program and family characteristics on couples' fertility, breastfeeding, and use of contraceptives in Malaysia.

Note: The authors wish to thank Terry Fain for his very capable programming assistance and Bill Butz

Which home activities lose more of the mother's attention when she enters the labor force?

Which types of market and nonmarket activities are most compatible with childcare? How does this compatibility vary with the age of the children?

How does the accompaniment of small children affect the efficiency with which a mother performs a particular task?

Everything else the same, is the amount of time that a woman devotes to housework or childcare positively or negatively related to her education?

The analyses presented here must be regarded as preliminary. They are primarily descriptive, use relatively simple statistical techniques (cross-tabulations and ordinary least squares regressions), and do not address some important questions, e.g., what types of women take their children with them when they perform various market and nonmarket activities. Nonetheless, we feel that this paper provides a useful first step toward a better understanding of families' time allocation in Malaysia.

Underlying Conceptual Framework

In this section, we briefly sketch the model of time allocation within the household underlying this research.

The household is viewed as consuming "commodities," such as meals or clean clothes, that it produces by combining its members' time inputs with market goods. Household members can either devote their time to this type of nonmarket production, or they can sell that time on the labor market and earn a wage. The household will allocate the time of its members and its expenditures on market goods in such a way that it will produce that combination of commodities that maximizes its utility.

An important determinant of a household's "demand" for a given commodity, say, clean clothes, is the number of persons in the house-

hold.[2] Age composition of the household is another important influence, as persons of different ages have different preferences or requirements (e.g., the household's "demand" for childcare will be greater the more children there are in the family, and probably the younger they are).

In equilibrium, the household supplies to the production of each commodity the number of hours necessary to produce the amount of the commodity it demands. Each person will devote more hours to (specialize in) the production of those commodities in which he or she has a comparative advantage relative to other commodities and other household members. Persons who are relatively more productive in the labor market (i.e., can command higher wages) will devote more time to labor market activities and less time to nonmarket activities, compared with persons who are relatively more productive in nonmarket activities.

A number of factors might affect an individual's productivity in performing an activity. For example, more highly educated persons may have higher productivity in all types of activities; this increased efficiency may be neutral across activities, or it may be greater in certain pursuits. (For example, a more highly educated woman may be able to type more letters per hour and wash more clothes per hour than a less well-educated woman, but the relative difference may be greater for letters than for clothes, in which case we would expect to see her spend more time in market activities compared with her less well-educated counterpart.)

One factor that may affect a woman's efficiency in performing certain tasks is whether her children accompany her while she performs these tasks.

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[2]This is analogous to the case of the market demand for any good, wherein an important determinant of the position of the market demand curve is the number of demanders, or the size of the market.

Other things being equal we would expect women who have children along to be less efficient in an absolute sense (produce less) compared with women who do not have them along, although child accompaniment might affect relative efficiencies in various activities differently.

It seems reasonable to presume that mothers are most likely to have their children accompany them when they are performing activities in which the child's presence impairs the mother's efficiency least, and that they are least likely to take them along when the opposite is true.[3] The reason is that, in the former case, the efficiency loss is likely to be less than the cost of making alternative childcare arrangements, whereas the opposite is likely to be true in the latter case.

Data

The empirical analyses in this paper use data from the Round I Female Time Budget of the Malaysian Family Life Survey[4] (although a few explanatory

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[3]Accordingly, women who are relatively more efficient when their children accompany them than are other women may be more likely to take their children along. Consideration of this possible "selectivity bias" is beyond the scope of this paper.

[4]This survey was designed by William P. Butz and Julie DaVanzo of The Rand Corporation in collaboration with, initially, persons at the Department of Statistics of the Government of Malaysia, and subsequently, the staff of Survey Research Malaysia, Sdn. Bhd. The survey was designed to provide data to investigate the influence of public-program and family characteristics on couples' fertility, breastfeeding, and contraceptive use. Because fertility, breastfeeding, and contraceptive use decisions are made jointly with many other family decisions, the underlying research approach emphasized the interrelatedness among life areas. Therefore, in addition to detailed retrospective data on pregnancy outcomes, durations of breastfeeding and postpartum amenorrhea, and types of contraceptives used and durations of use, extensive data were also collected on other related life areas, such as marriages, separations from spouse, characteristics of houses lived in, childcare, income and wealth, and employment and nonmarket time use of all family members.

The survey consisted of three rounds, each 4 months apart. Twelve hundred sixty-two households completed Round I; 1207 of these were also interviewed in Rounds II and III. The sample households are contained in 52 areas of Peninsular Malaysia (called Primary Sampling Units, or PSUs). Forty-nine of these areas were selected by area probability sampling methods. Three areas were purposely selected to give additional representation to Indian families and to families living in fishing communities. For more information about the survey, see Butz, William P. and Julie DaVanzo. 1978. The Malaysian Family Life Survey: Summary Report. The Rand Corporation, R-2351-AID, March 1978.

variables derive from other Round I instruments). This time budget questionnaire was administered to ever-married women less than 50 years of age, and elicited information on their time use in the four-month period preceding the interview.[5] For all market activities and for nonmarket activities of interest, including all jobs, unpaid family work, schooling, training, cottage industry, housework, and childcare (but excluding recreational activities and sleep), the questionnaire documents the number of hours spent at the activity in the last seven days it was performed, the number of weeks the activity was performed in the last four months, the rate of pay (if any) in cash and/or kind for the activity, distance from home to the place of the activity, amounts of help received and from whom, and presence of children less than 11 years old while the activity was being performed. The Female Time Budget documents the time use of female respondents and of their children living with them.[6]

Empirical Results

Two types of empirical analyses are presented in this paper. The first is concerned with the compatibility of market and nonmarket activities with childcare and presents cross-tabular information showing the likelihood that women with children of particular ages will have these children along when they perform these activities, by type of activity and ages of the children. We also consider how the accompaniment of children affects the number of hours that the woman spends performing the activity.

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[5]Round I lasted four months, from August to December 1976; hence the four-month reference period varies from April through August 1976 to August through December 1976, depending on when the household was interviewed for Round I.

[6]Another questionnaire, not used for this paper, elicited information on husbands' time use. However, we do use here information from the Female Time Budget questionnaire on the help that the husband gives to his wife with activities she performs.

In the second type of analysis, we estimate ordinary least squares regression equations to explain variations in the amount of time the household as a whole devotes to five household activities (washing and ironing clothes, shopping, cooking and preparing meals, cleaning, and caring for children), as a function of the size and age structure of the household, presence of modern labor-saving devices (such as washing machines), area of residence, and husband's and wife's education. These can be viewed, roughly speaking, as equations explaining the household's "demand" for the commodities (clean clothes, meals) produced by time devoted to the activities in question.[7] We also estimate equations to explain the numbers (and, in some cases, shares) of hours that t wife, husband, and children devote to these activities. These time inputs are a funct of the explanatory variables just discussed, as well as of some variables measuring the relative opportunity costs of the time of various household members, since we have hypothesized that these costs should be a major influence on intrahousehold allocation of time.[8]

Compatibility of Various Market Activities with Child Care

The proportion of women with children less than 11 years of age who have them along when they perform various market activities is shown in column 2 of table 1. Nearly half of the women who have sales occupations or production occupations (mostly weavers, food and beverage processors, and dressmakers)

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[7] In adding the hours spent by various household members and using that total input as a proxy for the amount of output, we implicitly assume that the hours various household members spend on household tasks are equally productive.

[8] Time and money constraints precluded us from attempting any joint estimation of the demand and supply equations for a given activity or across activities for a given individual. Although such procedures should improve the efficiency of resulting estimates, the single-equation approach used here should produce unbiased estimates as long as all independent variables are uncorrelated with the equation's error. (However, this assumption is questionable for several of our explanatory variables.) [Footnote continues on next page.]

and have children aged 10 or younger have their children with them when they work. On the basis of this crude measure, sales and production occupations appear to be the most compatible with childcare--perhaps because these activities can often be performed at home--whereas other occupations (including agricultural jobs) are less compatible. The lesser compatibility of agricultural activities with childcare is a bit surprising. It is often presumed that childcare and market work are more compatible in developing countries than in developed countries precisely because more women engage in agricultural activities, which are assumed to be very compatible with childcare.

Further analyses of when children accompany the mother as she performs various market activities should seek to explain a) which women "choose" to take their children with them, including an explicit consideration of the distance of the place of work from home; and b) how these considerations may affect occupational choice. The percentages in columns 1 and 3 of table 1 do

8 (cont'd)

We would like to note here several other shortcomings of the particular empirical specifications used in the preliminary analyses presented in this paper:

1) The samples for equations explaining husbands' and children's hours of help with various household activities contain all households in the survey sample, including households that do not contain husbands or children (of helping ages). In all regressions, we include explanatory variables that tell whether the household includes a husband or children (of helping ages); these provide a crude way of correcting for the fact that some households have a dependent variable whose value is zero simply because they do not include the members whose contribution is being explained.

2) Wage rates (of wives, husbands, or children) are set equal to zero for persons who did not work for pay (in cash or kind) in the four-month reference period, and hence do not measure the value of market opportunities for nonworkers.

3) The number of hours the wife works outside the home for pay, in cash or kind, is treated as exogenous in the equations explaining the number of hours she and other household members devote to nonmarket production, despite the fact that decisions regarding the number of hours the woman works outside her home are likely to be made jointly with the decisions under consideration.

4) Equations explaining proportions of the total activity done by the wife or husband are estimated by ordinary least squares, so some predicted values may fall outside the possible 0-to-1 range.

Table 1. Compatibility of Various Occupations with Childcare: Occupational Choice and Incidence of Child Accompaniment

Occupational Group	Number (Per cent) of Women With Children Aged ≤10 Who Engage in This Activity (% base = 1073)[a]	Per cent of These Women Whose Children Accompany Them When They Perform the Activity	Number (per cent) of Women With No Children Aged ≤10 Who Engage in This Activity (% base = 189)[a]
Professionals	33 (3.1%)	9.1%	9 (4.8%)
Managers	2 (0.2%)	(b)	1 (0.5%)
Clerical	9 (0.8%)	0.0%	7 (3.7%)
Sales	123 (11.5%)	48.8%	25 (13.2%)
Service	41 (3.8%)	22.0%	7 (3.7%)
Agricultural	1203(112.0%)	2.4%	205(108.0%)[a]
Production	246 (22.9%)	49.2%	43 (22.8%)

[a]Many women report more than one market activity; each activity is separately considered here. Hence the number of activities of a certain type can exceed the number of women in the sample. For this reason, the percentages in columns 1 and 3 for agriculture exceed 100 percent.

[b]Base = 2.

[c]Is significantly greater (5 per cent level) than the corresponding percentage for women with children aged ≤10. No other differences are significant at the 5 per cent level.

suggest that women with young children are less likely to have occupations, such as clerical or professional occupations, that are relatively incompatible with childcare (although the difference between the percentages in columns 1 and 3 is statistically significant only for clerical occupations).

In table 2 we look in more detail at the three broad occupational groups (agriculture, production, and sales) to which Malaysian women with children less than 11 years old (and, indeed, Malaysian women in general) are most likely to belong. (Small sample sizes preclude us from considering the other occupational groups.) We consider 1) how the likelihood that the child will accompany the mother when she performs the activity in question varies with the age of the child, and 2) how the likelihood of the child's accompanying the mother and the child's age are related to the number of hours the woman devotes to the activity over the four-month reference period. (Full-time work would be approximately 680 hours (40 hours/week x 17 weeks).)

First, considering the proportions of women with accompanying children who are less than 11 years of age, we see that for all three occupations women with one or more children aged 2 to 5 are generally the most likely to take the child along. This is generally true regardless of whether the women have other children aged 10 or less. Six- to ten-year-olds are typically least likely to accompany the mother, presumably because they are better able to take care of themselves, or because they are in school.

Next we consider the number of hours that women devote to these three market activities and how these hours vary by type of activity and the ages of the woman's children, and by whether these children are with her when she works. Child accompaniment may affect the number of hours a woman devotes to an activity because it affects her "efficiency" in performing the activity.

If the number of hours when a child accompanies the mother are less "effective," i.e., produce less output, than the same number of hours spent without the child, her marginal productivity and hence her wage rate will be reduced. Whether she works more or less will depend on whether the income or substitution effect predominates.

First, we note that women spend about twice as many hours in sales occupations than they spend in agricultural or production activities. Second, we consider how the ages of children affect the number of hours that a woman works in these three activities when no children accompany her (see table 2, column 2). In agricultural occupations, women with infants at home work less than other women engaged in the same occupation. The sample sizes for the other occupations are too small to permit valid comparisons, but they do suggest that women with children aged 10 or less at home spend less time in sales activities, but more time in production activities, compared with women in those occupations who have no children under age 10 at home. Numbers of children at home (as judged from the number of age groups represented) do not reduce hours markedly, except for those in agricultural occupations with children aged less than 2 and between 6 and 10. Having three (or more) children at home, all in different age groups, does appear to cause a substantial reduction (to around 3½ hours a week) in the amount of time devoted to production activities.

Third, we consider how child accompaniment affects mothers' hours of work. Women whose children accompany them when they perform agricultural activities do usually work fewer hours than those with similarly aged children who do not accompany the mother while she performs these tasks. Accompaniment of younger children appears to reduce hours worked more than accompaniment of older children; in fact, women with 6- to 10-year-olds work more hours when those children go along. The number of children accompanying (as judged from the number of age groups represented) does not appear to have much additional effect.[9]

[9]Sample sizes are too small to permit similar comparisons for other occupational groups, although figures not shown here for sales activities suggest that women who take children along work more hours than those who do not.

Table 2. Average Time Mothers Spent in Particular Market Activities, By Ages of Accompanying Children*

Market Activity/Type of Family	Age Group of Children Accompanying Mother: None — Percent of Row Total	None — Average Hours	Youngest Only — Percent of Row Total	Youngest Only — Average Hours	Eldest Only — Percent of Row Total	Eldest Only — Average Hours	Both — Percent of Row Total	Both — Average Hours	Total — Number of Women	Total — Average Hours
Agriculture										
No children aged ≤ 10	na	224.5	na	---	na	---	na	---	205	224.5
Have children aged ≤ 10										
Children aged <2 only	83	209.4	17	(a)	na	---	na	---	52	190.8
Children aged 2-5 only	69	278.6	31	152.7	na	---	na	---	144	239.3
Children aged 6-10 only	85	229.1	15	244.4	na	---	na	---	302	231.4
Children aged <2 and 2-5	68	230.6	4	(a)	17	121.8	11	(a)	79	204.2
Children aged <2 and 6-10	86	156.3	3	(a)	11	(a)	0	---	36	177.1
Children aged 2-5 and 6-10	72	278.0		129.7	4	200.0	12	124.0	391	237.7
			1 Age Group Accompanied		2 Age Groups Accompanied		All Age Groups Accompanied			
Children aged <2, 2-5 and 6-10	73	209.5	15	129.6	9	108.1	3	116.2	199	185.9
Production			Youngest Only		Eldest Only		Both			
No children aged ≤ 10	na	156.1	na	---	na	---	na	---	43	156.1
Have children aged ≤ 10										
Children aged <2 only	57	(a)	43	(a)	na	---	na	---	14	273.3
Children aged 2-5 only	36	(a)	64	173.2	na	---	na	---	28	169.9
Children aged 6-10 only	82	273.8	18	(a)	na	---	na	---	50	242.2
Children aged <2 and 2-5	41	213.5	9	(a)	22	(a)	28	(a)	32	144.6
Children aged <2 and 6-10	50	(a)	42	(a)	0	---	8	(a)	12	181.3
Children aged 2-5 and 6-10	52	182.2	30	75.6	2	(a)	16	(a)	63	148.8
			1 Age Group Accompanied		2 Age Groups Accompanied		All Age Groups Accompanied			
Children aged <2, 2-5 and 6-10	30	58.1	32	50.0	28	356.7	11	(a)	47	156.0
Sales			Youngest Only		Eldest Only		Both			
No children aged ≤ 10	na	636.5	na	---	na	---	na	---	25	636.5
Have children aged ≤ 10										
Children aged <2 only	75	(a)	25	(a)	na	---	na	---	8	(a)
Children aged 2-5 only	63	(a)	37	(a)	na	---	na	---	8	(a)
Children aged 6-10	77	474.6	23	(a)	na	---	na	---	31	556.7
Children aged <2 and 2-5	50	(a)	0	---	10	(a)	40	(a)	10	340.3
Children aged <2 and 6-10	42	(a)	17	(a)	8	(a)	33	(a)	12	614.8
Children aged 2-5 and 6-10	36	339.5	28	468.6	13	(a)	23	(a)	39	494.0
			1 Age Group Accompanied		2 Age Groups Accompanied		All Age Groups Accompanied			
Children aged <2, 2-5 and 6-10	27	(a)	13	(a)	40	(a)	20	(a)	13	297.2

* Hours data are for a four-month reference period.
na = not applicable.
(a) = Sample wize<10.

Compatibility of Nonmarket Activities with Childcare

Table 3 presents figures for two housework activities--shopping and washing--usually performed outside the home in Malaysia. Here, number and ages of children may affect the household's demand for the commodities (clean clothes and groceries) produced by time inputs to washing and shopping--e.g., more children mean more clothes to be washed. In addition, child accompaniment while the activity is performed may affect the amount of time spent on it. Child accompaniment may increase the amount of time it takes the mother to produce a given amount of a commodity. However, it may also affect the amount demanded (through income and substitution effects). We cannot predict a priori whether women whose children accompany them will spend more or less time in accomplishing these tasks than otherwise similar women whose children do not accompany them.

First, looking at the likelihood of child accompaniment, we see that, for all except one age group (6 to 10), children are less likely to be with mothers when they go shopping than when they do washing, perhaps because the former activity is more likely to be away from home than the latter.

In both of these activities 2- to 5-year-olds are most likely and 6- to 10-year-olds least likely to accompany their mothers. Women with the greatest numbers of children under 11 years of age are the most likely to take some children along when they do their washing.

Surprisingly, women with no children under age 11 spend more hours washing clothes than women with young children (regardless of whether those children accompany the mother), although the former may have older children (a fact that we control for later in our regression analyses). Among women with children less than age 11, women with 6- to 10-year-olds typically spend relatively more time performing these activities (this is especially true for women who do not take their children along).

Table 3. Average Time Mothers Spent in Particular Household Activities, By Ages of Accompanying Children*

Household Activity/Type of Family	Age Group of Children Accompanying Mother: None — Percent of Row Total	None — Average Hours	Youngest Only — Percent of Row Total	Youngest Only — Average Hours	Eldest Only — Percent of Row Total	Eldest Only — Average Hours	Both — Percent of Row Total	Both — Average Hours	Total — Number of Women	Total — Average Hours
Washing										
No children aged <10	na	213.8	na	---	na	---	na	---	189	213.8
Have children aged<10										
Children aged < 2 only	56	115.8	44	132.0	na	---	na	---	86	123.0
Children aged 2-5 only	53	106.9	47	156.8	na	---	na	---	126	130.2
Children aged 6-10 only	88	133.0	12	137.8	na	---	na	---	242	133.5
Children aged <2 and 2-5	62	128.5	10	128.5	13	128.2	16	140.3	102	130.3
Children aged <2 and 6-10	75	106.5	23	164.9	0	---	2	(a)	43	120.3
Children aged 2-5 and 6-10	55	132.0	27	161.8	5	109.8	13	153.4	296	142.0
			1 Age Group Accompanied		2 Age Groups Accompanied		All Age Groups Accompanied			
Children aged<2,2-5 and 6-10	50	146.2	21	154.0	21	214.1	9	124.3	178	159.6
Shopping			Youngest Only		Eldest Only		Both			
No children aged ≤ 10	na	58.9	na	---	na	---	na	---	189	58.9
Have children aged ≤ 10										
Children aged < 2 only	66	45.2	34	73.9	na	---	na	---	86	54.9
Children aged 2-5 only	60	48.3	40	86.6	na	---	na	---	126	63.5
Children aged 6-10 only	84	66.5	16	85.2	na	---	na	---	242	69.5
Children aged <2 and 2-5	64	50.9	9	(a)	13	91.4	10	72.7	102	63.0
Children aged <2 and 6-10	88	52.8	9	(a)	2	(a)	0	---	43	55.2
Children aged 2-5 and 6-10	61	59.3	25	110.9	5	68.5	9	88.5	296	75.3
			1 Age Group Accompanied		2 Age Groups Accompanied		All Age Groups Accompanied			
Children aged<2,2-5 and 6-10	65	46.3	23	65.5	11	72.0	1	(a)	178	53.7

* Hours data are for a four-month reference period.
na = not applicable.
(a) = Cell size ≤ 10.

Of women with young children, those whose children accompany them almost always spend more hours performing these activities than women whose children do not accompany them. The relative differences are nearly always greater for shopping than for washing. For both activities, 2- to 5-year-olds, the group most likely to accompany the mother, most impair her efficiency (i.e., increase her hours), whereas 6- to 10-year-olds, the group least likely to accompany, have the smallest effect.

These results on compatibility of nonmarket activities with childcare are generally consistent with those in the previous subsection on market activities: 1) children are less likely to accompany the mother as the distance from home to the place where the activity is conducted increases; 2) 2- to 5-year-olds are the most likely, 6- to 10-year-olds the least likely, to accompany their mother. However, unlike women participating in market activities, who tend to devote less time to an activity when their children go along, women performing market activities accompanied by children tend to take longer. We see in the regressions below that this may be because women who take their children along do so for lack of other household or nonhousehold members to help them either with the activity in question or with child care.

Variations in Time Inputs to Nonmarket Production

Next we turn to regressions explaining the number of hours the wife devotes to the nonmarket activities just discussed (washing clothes and shopping). We also estimate equations explaining variations in the number of hours the household as a whole spends on these activities (household "demand") and equations explaining number of hours that husbands and children devote to helping the women with these tasks. We then estimate similar equations explaining variations in the numbers of hours that the household as a whole, the wife, husband,

and (older) children spend preparing and cooking meals, cleaning house, and caring for children.

Before discussing the regressions, we look, in table 4, at the mean number of hours that households and their members devote to the five nonmarket activities considered in the regressions.

Childcare is the activity to which the household and its various members devote the most time (48 hours per week for the household), followed by cooking and preparing meals (28 hours per week); washing, cleaning, and shopping each take from 9 to 13 hours a week.

Wives contribute around two-thirds of all hours that the household devotes to these nonmarket activities, children nearly 20 per cent, and husbands less than 10 per cent. Both in absolute terms and relative to total household hours, husbands' contributions are greatest in childcare (around 5 hours a week) and in shopping (3¼ hours a week). Husbands contribute around three-eighths of the family's total shopping hours, but give little help with washing, cooking, and cleaning.

About 21 hours of nonmarket activity are performed each week by the household's children. Children help at least an hour per week with each of the five listed activities. Sixty per cent of their time is spent caring for siblings and helping with the cooking. Another 20 per cent is spent helping to clean the house; they contribute one-third of all household hours to this task. They also contribute one-fourth of all household hours spend washing and ironing.

Non-household members (including paid helpers) and household members other than the wife, husband, and children frequently help with childcare and cooking. For these two activities, the total number of hours spent by the wife, husband, and children are less than 90 per cent of the total number of hours that the activity is performed for the household.

Table 4. Mean Number of Hours Households Spend in Nonmarket Activities*

Activity	Entire Household [a]	Wife	Husband	Children
Washing and ironing	216 (12%)	151 (13%) (70%)	1.76 (1.1%) (0.8%)	54.4 (15%) (25%)
Shopping	151 (8%)	80.1 (6.7%) (53%)	55.8 (35%) (37%)	20.6 (5.7%) (14%)
Cooking and preparing meals	480 (26%)	313 (26%) (65%)	7.43 (4.7%) (1.5%)	100 (28%) (21%)
Cleaning house	202 (11%)	132 (11%) (65%)	4.09 (2.6%) (2.0%)	71.3 (20%) (35%)
Child care	817 (44%)	522 (44%) (64%)	89.9 (57%) (11%)	116 (32%) (14%)
Total	1866	1198 (64%)	159 (8.5%)	362 (19%)

Note: Numbers in parentheses beneath hours figures are percentages of the row total. Numbers in parentheses to the right of hours figures are column percentages. The mean number of hours for the entire household will be less than the sum of the wife's husband's, and children's hours if other household or nonhousehold members help with the activity. For shopping and housecleaning the sum of the wife's, husband's, and children's hours slightly exceeds the number of hours for the entire household because of round-off error.

* Hours data are for a four-month reference period.
[a] Includes nonhousehold help.

Total Number of Hours Devoted to Nonmarket Activities ("Demand")

Household size and composition appear to be the most important determinants of the total number of hours that the household as a whole devotes to nonmarket activities, with the exception of shopping (where race and location of residence are the main correlates). For example, we see in Appendix table 4 that it is the numbers of persons in the household, rather than the number of rooms per se, that affect the number of hours that household members spend in cleaning. It is interesting that households spend significantly more time cleaning when their houses are provided by their employers. Households with washing machines (1.8 per cent of the sample) spend nearly 25 per cent less time washing clothes (although the difference is not statistically significant at the 5 per cent level). No other house characteristic (e.g., type of toilet or water supply) appears to affect the number of hours that household members devote to household chores.[10]

The number of additional hours due to the presence of an additional household member is positively related to that member's age for washing and cooking, and negatively related to members' ages for childcare time. An (additional) infant increases total household hours devoted to childcare by 31 hours per week, while that infant increases washing hours by about an hour per week, and cooking hours by around 2 hours a week. Two- to five-year-olds appear to require 12½ hours of child care each week, and 6- to 10-year-olds about half that amount.[11] Households that contain nonrelative adults other

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[10]The data also contain information on types of stoves, cookers, and irons, and whether the household has electricity, all of which could be investigated in further research.

[11]The specification of the equation does not allow for economies of scale in childcare by explicitly considering combinations of children through interactions or by allowing for nonlinearities within age groups.

than servants (typically boarders) devote considerably more time to childcare (and cooking) than those without such persons. Households with children in school spend less time on childcare than those with similarly aged children not in school, presumably because schools are a type of childcare substitute.

Households with servants spend considerably more time washing, but not in the other activities considered, suggesting that servants' main contribution is in washing clothes and that, for a given family size and composition, households that hire servants may be those with relatively greater demands for clean clothes.[12]

Husbands' and wives' education have little effect on the amount of time allocated to most household activities, although we do find that households spend significantly more time washing clothes the more highly educated the husband is, and that they devote significantly more time to cooking and cleaning the more highly educated the wife is. The reason for the former result may be that more highly educated husbands are likely to have jobs for which clean and pressed "white collars" are required. It is noteworthy that, when family composition is held constant, households headed by highly educated husbands and wives spend no more time with their children than those in which the parents have less education.

Chinese households spend significantly less time than Malays in all nonmarket activities except childcare, for which they spend significantly more time. Other things being equal, Indians spend the most time with their children. They also spend significantly more time preparing meals than either the Malays or the Chinese.

The significant coefficients for month of interview suggest either seasonal variation and/or regional variation, since different areas were

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[12]The number of households with servants is small. The 1,262 households in the sample have 20 servants altogether.

interviewed in different months. Households interviewed in December (many of which were the purposively selected households in fishing communities) spent significantly more time cooking and cleaning and significantly less time caring for children. Families living on the east coast of Malaysia spent over 3½ hours more per week shopping than those in other parts of the country, whereas those in metropolitan areas spent significantly less time preparing meals.[13]

Intrahousehold Allocation of Time to Nonmarket Activities

In Appendix tables 1 through 5 we present equations explaining the number of hours that wives, husbands, and children devote to the five nonmarket activities considered here.[14] We also present regressions on the husbands' and wives' shares of total household hours spent on these activities.

We see in Appendix tables 1 and 2 that, in terms of absolute hours, wives often spend more time on washing and shopping when accompanied by their children, but that they always spend significantly larger shares of total household hours on these activities when their children accompany them. That the effects are usually stronger on her share than on her absolute number of hours suggests that the woman who takes her children along receives less help from other members of her household than the woman whose children do not accompany her. It may be that the woman who takes her children with her has fewer substitutes available for her own time in performing these activities or for watching her children while she rerforms these activities away from home.

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[13]It is puzzling that families that consume homegrown crops spend significantly more time shopping; perhaps they live farther from markets.

[14]We do not present equations for the hours spent by husbands in washing, cooking, or cleaning or those spent by children in shopping, since the average levels are very low (see table 4).

Another noteworthy result in the regressions explaining the wives', husbands', and children's contributions to nonmarket production is the strong evidence of substitution among household members and between market and nonmarket activities for wives. The wife devotes less time, and especially a smaller proportion of total household time, to most nonmarket activities the greater are the number of hours she works outside her home for pay (in cash and/or kind). Her wage rate and the distance to her place of employment are also usually negatively related to her hours of nonmarket work, although the coefficients are typically not sign icant (perhaps because much of their effect is picked up through the variable measuring the wife's hours of market work).

In absolute terms, childcare is the activity that suffers the greatest reduction in the mother's time input when she works outside the home. Relative to women's mean hours in the activity, women also substantially reduce the time they devote to cooking the more they work outside the home.[15]

Husbands and children help more hours in household activities the greater the number of hours the wife is employed outside the home, indicating a substitution among household members. Further evidence of substitution among household members is seen in the positive child wage coefficient in the equation explaining wives' share of washing hours, suggesting that, for a given household composition, wives perform a greater share of certain activities when their children have good opportunities outside the home.[16]

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[15]The distance elasticity is largest in absolute magnitude for cleaning, whereas the wife's wage elasticities are largest for shopping and cleaning.

[16]The significantly negative coefficient of the husband's wage in explaining the number of hours that the wife spends on washing is probably the result of an income effect (whereby higher-income families can afford servants and laundry services).

In addition to helping with shopping and childcare, and also with the other activities (in regressions not shown here), when their wives are employed outside the home, husbands are most likely to help when there are infants at home. Husbands help less in families with older children, presumably because these children help instead.[17] Indeed, children's hours of nonmarket work are generally greatest in families with children 10 years of age or older. Chinese children typically help less around the house compared with Malays, whereas Indian children and those of other races help more.

Children in towns are most likely to help care for siblings. Also, the less educated the children's mothers, the more likely the children are to care to other children in the family. Older children and institutional care appear to be used complementarily in caring for younger children (i.e., children's hours spent in childcare are greater in households that also use institutional care).

Childcare by Others

In addition to equations explaining the number of hours (in the four-month reference period) that the entire household, wife, husband, and older children spent caring for children, we also include in Appendix table 5 an equation (Column 6) explaining the number of hours spent (in a typical week)

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[17]Also, husbands are more likely to help with shopping in families with servants and in families that own cars. Chinese husbands are significantly less likely to help with the shopping. Husbands spend more time with their children in households that have television sets (which we thought might provide a substitute for human childcare). Watching children and watching television appear to be complementary activities for fathers. Alternatively, this might be a measurement of an income effect; i.e., wealthier fathers (as indexed by the presence of a television set) choose to spend more time with their children. We do see in column 2 of Appendix table 5 that wealthier families, as measured by the value of their property, spend more time in childcare, but we have not investigated whether it is all, or only particular, family members that increase their childcare time.

in childcare by persons other than the husband and wife-- by their children, parents, other relatives, neighbors, servants, and institutional help.[18] We include dummies in all regressions in Appendix table 5 to indicate the types of alternative care used (several types may be used simultaneously).

Coefficients of dummies for types of childcare used show the additional number of hours spent in childcare by households that use one of these types of care compared with households in which the husband and wife are the only ones who care for children, when all other independent variables are held constant. Childcare provided by older children, husbands' or wives' parents, neighbors, and institutional help, each increase the total number of childcare hours by 12 to 16 hours per week. Households with servants spend an extra 26 hours per week with children; number of servants appears to have no effect.

The number of hours that persons other than the husband and wife spend in childcare is positively related to the wife's wage and the number of hours she works away from home; the higher the cost of her own time spent on childcare, the more likely she is to use alternative means of care. If some of her children work or are in school, she is less likely to use them or others to care for younger children.[19] Alternative childcare is also used more frequently by older mothers and by Chinese and Indians.[20]

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[18]This latter information derives from the Female Retrospective questionnaire.

[19]It is puzzling that the child wage coefficient is negative and significant in the equation explaining total number of hours of alternative childcare, which includes help from children, but is insignificant in the equation explaining number of hours children help with childcare.

[20]Chinese and Indian households, and those of other races, appear to spend more time with their children than Malay households. Non-Malay mothers and fathers both spend more hours in childcare than Malays. In addition, Chinese and Indians supplement this care with that provided by nonhousehold members to such an extent that, despite the mother's larger number of hours, her share is smaller, especially in Chinese families.

Summary and Suggestions for Further Research

The most interesting findings of this research are the following:

--Agricultural activities appear to be less compatible with childcare than sales or production occupations. Nearly 50 per cent of women with children aged 10 or less who have sales or production occupations have (some of) these children with them when they work, compared with 24 per cent of such women for agricultural activities and 22 per cent for service activities. Very few women engaging in other market occupations have their children with them when they work.

--Two- to five-year-olds are more likely to accompany the mother when she performs market and out-of-home nonmarket activities than are older or younger children.

--Women who take their children with them generally spend less time in market activities and more time in nonmarket activities compared with women with similarly aged children not accompanying them. Women who have their children along when they perform nonmarket activities may do so because of fewer available substitutes for the mother's time in the activity in question or in childcare.

--Women work less in the home, and husbands, children, and others (including nonhousehold members) help more, the greaters are the number of hours that the wife works outside the home. Husbands help more in families that include infants and less in families with older children.

--In absolute terms, childcare is the activity that loses most of the mother's attention when she increases the number of hours that she works outside her home. In relative terms, childcare and cooking have the greatest reductions.

--Household size and age composition are the most important determinants of the number of hours that the household as a whole spends in nonmarket production. Although other family members help in large families, and the wife's share of total hours is less in such instances, the number of hours that she devotes to nonmarket production is generally positively related to family size. This suggests that higher fertility increases her obligations at home and reduces the number of hours she can participate in the labor force.[21]

There seem to be a number of potentially interesting directions in which one could extend the very preliminary analyses presented here:

--Market labor supply decisions should be integrated into the model and treated as a dependent variable. The Malaysian Family Life Survey data contain relevant information on women's previous work experience and on local labor market characteristics. Such an analysis could yield estimated values of time for nonworkers that could be used as explanatory variables in the equations explaining time spent in nonmarket activities.

--Type of childcare chosen (including decisions to have children accompany the mother when she performs various activities) could be treated as dependent variables to explore what types of women choose various types of childcare. Included here should be further analyses of characteristics of jobs most compatible with childcare (e.g., distance from home, whether self-employed or working in family business, etc.).

--Whether the sex of children affects their inputs to household activities when they are older or the number of hours they are cared for when young is another interesting topic that could be explored with these data. This aspect

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[21]Of course, it is possible that the causation runs the other way: Women who are relatively more productive in the home than in the market may choose to have larger families.

of nonmarket activity has potential implications about the "quality" and economic value of children. Also, interaction variables could be used to investigate whether particular age or sex combinations of children have especially detrimental or beneficial effects on family members' productivity. Such an analysis may have implications about the optimal spacing of children.

Appendix Table 1. Determinants of Time Spent Washing and Ironing

Explanatory Variables	Total Household Hours		Wife's Hours		Children's Hours		Wife's Proport of Total Hou	
	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"
Household Composition								
No. children aged <2	10.34	(0.92)	- 5.19	(-0.25)	- 1.22	(-0.12)	-0.053	(-3
No. children aged 2-5	- 1.10	(-0.15)	-10.63	(-0.79)	9.40	(1.48)	-0.012	(-1
No. children aged 6-10	16.19	(1.85)	5.57	(0.34)	7.15	(0.86)	0.001	(0
No. children aged 10-14	25.82	(2.59)	17.40	(0.94)	25.96	(2.68)	-0.065	(- 4
No. children aged 15+	37.58	(6.98)	8.23	(0.81)	51.00	(9.61)	-0.11	(-13
No. Relatives aged 15-49[a]	30.44	(5.32)	14.80	(1.33)	- 6.90	(-1.19)	-0.049	(- 5
No. Relatives aged 50+[a]	27.25	(2.81)	30.48	(1.68)	7.98	(0.84)	-0.033	(- 2
No. Other Adults[b]	-34.26	(-0.63)	-25.56	(-0.25)	8.64	(0.16)	-0.125	(- 1
No. Servants[b]	128.69	(1.80)	-12.48	(-0.09)	-27.24	(-0.39)	-0.205	(- 1
Dummy = 1 if woman has husband[b,c]	31.19	(0.54)	65.79	(0.61)	-16.25	(-0.29)	0.185	(2
No. children in school[d]	- 7.99	(-0.81)	- 6.70	(-0.37)	-11.78	(-1.23)	0.015	(1
Area of Household's Residence								
Metropolitan[e]	1.34	(0.08)	38.59	(1.33)	-12.97	(-0.85)	0.001	(0
Other town[f]	-30.03	(-2.04)	10.54	(0.39)	-15.09	(-1.05)	0.006	(0
East coast	6.75	(0.34)	- 2.18	(-0.05)	0.90	(0.05)	.023	(0
Education (Years of Schooling)								
Wife	0.73	(0.38)	- 0.93	(-0.26)	-0.28	(-0.15)	-0.011	(- 3
Husband	5.51	(3.05)	- 1.42	(-0.42)	0.77	(0.43)	-0.006	(- 2
Race								
Chinese	-56.45	(-4.00)	-74.51	(-2.82)	-24.14	(-1.74)	-0.003	(- 0
Indian	- 5.85	(-0.32)	-32.02	(-0.93)	25.48	(1.41)	-0.013	(- 0
Other than Chinese, Indian, or Malay	48.72	(0.99)	-27.74	(-0.31)	48.06	(1.00)	-0.109	(- 1
Month of Interview								
August	15.53	(0.55)	90.54	(1.74)	37.11	(1.36)	0.061	(1
September	3.65	(0.15)	54.97	(1.27)	-28.21	(-1.24)	0.106	(3
October	-28.47	(-1.24)	2.00	(0.04)	- 7.14	(-0.32)	0.065	(1
November	-37.68	(-1.63)	18.95	(0.44)	-22.56	(-0.99)	0.101	(2
Wife's Age	0.72	(0.83)	- 3.33	(-2.04)	0.01	(0.00)	-0.004	(- 3
Children Accompanying Mother Washing								
No. aged <2	18.77	(1.00)	37.59	(1.08)	---	---	0.041	(1
No. aged 2-5	14.07	(1.36)	- 2.93	(-0.15)	---	---	0.038	(2
No. aged 6-10	- 8.15	(-0.60)	54.62	(2.18)	---	---	0.043	(2
Water Supply and Washing Machine								
Dummy = 1 if household has washing machine	-50.87	(-1.25)	-19.72	(-0.26)	-11.60	(-0.29)	0.045	(0
Water supply scale[g]	- 1.18	(-0.32)	1.09	(0.10)	5.64	(1.54)	0.005	(0
Wife's Work Outside Home								
Distance from home to work[h]	---	---	- 3.50	(-0.34)	8.70	(1.60)	-0.023	(- 2
No. Hours[i]	---	---	- 0.03	(-1.07)	0.02	(1.62)	-0.001	(- 4
Wage Rates of Family Members[j]								
Wife	---	---	- 3.96	(-0.71)	- 2.71	(-0.92)	-0.003	(- 0
Children (average)	---	---	-14.70	(-1.16)	- 4.06	(-0.61)	0.029	(2
Husband	---	---	- 3.07	(-0.66)	1.53	(0.63)	-0.015	(-3
Constant	158.51		248.98		- 6.82		1.154	
R^2	.147		.036		.160		.345	
$\bar{R}^2$	.127		.009		.138		.326	
Mean of dependent variable	216.1		151.		54.4		.734	

Notes to Appendix Table 1.

[a]Does not include husband, wife, or their offspring.

[b]"No. other adults" includes all adults other than relatives and children of the husband and wife; hence it includes the husband and wife as well as servants and a few boarders and lodgers. Therefore the total effect for husband and servants is the coefficient of those variables plus the coefficient of "no. other adults."

[c]This dummy equals 1 if a husband is listed as a household member in the household roster.

[d]To compare the effect of having children in school with that of having no children at all, add this coefficient to that of the appropriate "number of children" variable.

[e]A dummy that equals 1 if the household resides in one of the three largest cities in Malaysia--Kuala Lumpur, Ipoh, or Penang.

[f]A dummy that equals 1 if the household resides in a town or village whose population was over 10,000 in 1967 (other than the three largest cities in Malaysia) or in an area of less than 10,000 where it is estimated that at least 50 per cent of the work force is engaged in non-agricultural occupations.

[g]A scale that = 0 if household (HH) has no piped water,

= 1 if HH has piped water outside the home and not exclusive to it,

= 2 if HH has piped water outside the home exclusive to the HH,

= 3 if HH has indoor piped water, not exclusive to this HH,

= 4 if HH has indoor piped water exclusively for its use.

[h]A scale that = 0 if wife doesn't work or works at home,

= 1 if her place of work is less than a mile from home,

= 2 if distance to work is 1 to 3 miles,

= 3 if distance to work is 3 miles or more.

[i]Number of hours wife worked outside her home for pay (in cash or kind) in the four-month reference period.

[j]Hourly wage rate (includes payments in kind, as well as cash).

Appendix

Table 2. Determinants of Time Spent Shopping

Explanatory Variables	Total Household Hours		Wife's Hours		Husband's Hours		Wife's Proportion		Husband's Proportion	
	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"
Household Composition										
No. children aged < 2	- 4.52	(-0.34)	24.60	(1.26)	12.70	(1.36)	-.049	(-2.31)	.039	2.18)
No. children aged 2-5	- 2.47	(-0.29)	-14.51	(-1.19)	- 5.33	(-0.93)	-.009	(-0.68)	-.004	-0.31)
No. children aged 6-10	6.44	(0.85)	4.11	(0.38)	7.02	(1.37)	-.001	(-0.10)	.003	0.33)
No. children aged 10-14	11.36	(1.52)	2.01	(0.19)	- 6.78	(-1.26)	-.010	(-0.86)	-.020	-1.89)
No. children aged 15+	6.74	(1.00)	11.45	(1.19)	3.79	(0.78)	-.009	(-0.87)	-.038	-0.45)
No. relatives aged 15-49[a]	11.80	(1.69)	- 1.29	(-0.12)	- 7.05	(-1.34)	-.025	(-2.16)	-.038	-3.66)
No. relatives aged 50+[a]	9.48	(0.78)	- 8.19	(-0.47)	5.39	(0.62)	-.099	(-5.19)	-.029	-1.70)
No. other Adults[b]	18.40	(0.28)	26.67	(0.28)	- 6.48	(-0.13)	-.022	(0.21)	-.012	-0.14)
No. servants[b]	-22.69	(-0.26)	61.96	(0.49)	129.70	(2.05)	.001	(0.00)	-.043	-0.35)
Dummy = 1 if woman has husband[b,c]	-11.01	(-0.16)	-14.26	(-0.14)	56.75	(1.11)	-.163	(-1.48)	.288	2.95)
Area of Household Residence										
Metropolitan[e]	0.08	(0.00)	74.45	(2.67)	4.18	(0.30)	.174	(5.76)	-.103	-3.83)
Other town[f]	- 2.39	(-0.13)	30.06	(1.17)	6.18	(0.48)	.043	(1.54)	-.035	-1.43)
East coast	62.82	(2.56)	18.20	(0.52)	- 3.80	(-0.21)	.055	(1.45)	-.039	-1.15)
Education (Years of Schooling) of										
Wife	-0.088	(-0.03)	0.97	(0.29)	- 0.64	(-0.37)	-.001	(-0.35)	.001	0.16)
Husband	0.47	(0.21)	- 2.29	(-0.72)	0.33	(0.20)	-.004	(-1.22)	.0003	0.12)
Race										
Chinese	-34.41	(-1.89)	-19.05	(-0.76)	-52.50	(-4.15)	.166	(6.08)	-.153	6.34)
Indian	-34.35	(-1.51)	2.48	(0.08)	14.34	(0.87)	-.096	(-2.71)	.128	4.03)
Other than Chinese, Indian, or Malay	-91.46	(-1.53)	-29.41	(-0.34)	-59.50	(-1.38)	.045	(0.48)	-.159	1.91)
Month of Interview										
August	7.62	(0.22)	106.32	(2.16)	24.35	(0.98)	.055	(1.02)	-.038	).78)
September	22.55	(0.77)	30.72	(0.75)	26.95	(1.30)	-.034	(-0.74)	.064	..60)
October	-28.37	(-0.99)	-13.16	(-0.32)	8.46	(0.41)	-.050	(-1.14)	.08	..54)
November	12.71	(0.44)	- 8.93	(-0.21)	27.80	(1.33)	-.102	(-2.26)	.089	.21)
Wife's age	0.25	(0.24)	- 2.07	(-1.35)	- 0.39	(-0.50)	-.004	(-0.19)	-.001	.66)
Children Accompanying Mother Shopping										
No. aged < 2	14.30	(0.53)	-25.10	(-0.64)	---	---	.140	(3.33)	---	--
No. aged 2-5	31.08	(2.27)	17.27	(0.88)	---	---	.081	(3.83)	---	--
No. aged 6-10	- 0.64	(-0.03)	- 4.97	(-0.19)	---	---	.088	(3.03)	---	--
Other										
No. Cars owned by household	23.31	(1.05)	33.11	(1.04)	28.04	(1.75)	-.082	(-2.38)	.055	(79)
Dummy = 1 is household eats homegown crops	33.91	(1.88)	-13.24	(-0.51)	15.48	(1.18)	.049	(1.71)	-.081	(24)
Dummy = 1 if household eats homegrown animals	-20.49	(-1.28)	-10.18	(-0.44)	- 6.04	(-0.52)	.034	(1.37)	-.006	(24)
Dummy = 1 if household runs a food store or business	38.18	(0.38)	- 8.86	(-0.06)	18.27	(0.25)	-.128	(-0.80)	.114	(81)
House quality scale[k]	- 3.28	(-1.25)	---	---	---	---	---	---	---	-
Wife's Work Outside Home										
Distance from home to work[h]	---	---	- 0.33	(-0.03)	- 0.07	(-0.00)	.004	(0.35)	.013	(35)
No. hours[i]	---	---	0.02	(0.56)	0.02	(1.40)	-.0001	(-3.52)	.0001	(78)
Wage Rates of Family Members [j]										
Wife	---	---	- 5.79	(-1.10)	- 3.62	(-1.36)	.0001	(0.00)	.007	(:8)
Children (average)	---	---	- 6.53	(-0.54)	- 4.18	(-0.70)	-.006	(-0.44)	-.007	(-6)
Husband	---	---	- 1.35	(-0.31)	- 0.34	(-0.15)	.008	(1.70)	-.003	(-6)
Constant	80.74		62.86		- 3.38		.756		.049	
R^2	.050		.026		.071		.234		.255	
$\bar{R}^2$	.026		.000		.047		.212		.235	
Mean of Dependent Variable	151.1		80.1		55.8		.532		.281	

Note: For footnotes a through j, see Notes to Appendix table 1.

[k] A scale ranging from 0 to 11, with a mean of 3.7, where higher values indicate better housing quality (house has indoor piped water exclusively for its use, has walls of brick or concrete, has a sidewalk or long path, has an indoor flush toilet exclusively for this household's use, has a higher rooms-per-person ratio).

Appendix Table 3. Determinants of Time Spent Preparing Meals

Explanatory Variables	Total Household Hours		Wife's Hours		Children's Hours		Wife's % of Tot
	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient
Household Composition							
No. children aged <2	33.31	(1.67)	41.29	(2.17)	-2.40	(-0.18)	-.015
No. children aged 2-5	35.09	(2.80)	-6.66	(-0.57)	14.08	(1.72)	-.005
No. children aged 6-10	4.23	(0.26)	21.17	(1.97)	7.94	(1.06)	-.012
No. children aged 10-14	32.81	(1.71)	10.61	(0.96)	36.40	(4.76)	-.033
No. children aged 15+	70.19	(7.56)	-8.91	(-0.91)	73.94	(10.79)	-.085
No. relatives aged 15-49[a]	70.95	(6.51)	-7.83	(-0.73)	-6.23	(-0.83)	-.076
No. relatives aged 50+[a]	88.79	(4.77)	8.83	(0.50)	-3.28	(-0.27)	-.093
No. other adults[b]	174.41	(1.67)	110.16	(1.12)	-13.74	(-0.20)	.081
No. servants[b]	-58.42	(-0.43)	-173.31	(-1.34)	-35.45	(-0.39)	-.385
Dummy = 1 if woman has husband[b,c]	-103.11	(-0.93)	-73.87	(-0.71)	40.04	(0.55)	-.091
No. children in school[d]	22.22	(1.18)	—	—	—	—	—
Area of Household's Residence							
Metropolitan[c]	-74.95	(-2.54)	50.56	(1.81)	-28.70	(-1.48)	.016
Other town[f]	4.91	(0.18)	25.05	(0.96)	-18.22	(-1.01)	.014
East coast	25.24	(0.66)	40.37	(1.12)	3.33	(0.13)	.026
Education (Years of Schooling) of							
Wife	7.56	(2.07)	-2.96	(-0.85)	1.25	(0.52)	-.010
Husband	1.22	(0.36)	1.41	(0.43)	2.38	(1.04)	-.0002
Race							
Chinese	-40.49	(-1.58)	-25.10	(-1.03)	-9.45	(-0.56)	-.002
Indian	85.33	(2.47)	36.00	(1.10)	16.15	(0.71)	.012
Other than Chinese, Indian, Malay	-7.41	(-0.08)	-61.41	(-0.70)	123.58	(2.01)	-.071
Month of Interview							
August	-146.85	(-2.75)	-9.54	(-0.19)	-118.86	(-3.39)	.09
September	-131.07	(-2.95)	6.05	(0.14)	-107.57	(-3.68)	.091
October	-102.50	(-2.32)	-21.77	(-0.53)	-66.22	(-2.30)	.04
November	-76.93	(-1.73)	33.38	(0.80)	-62.41	(-2.14)	.066
Wife's Age	2.42	(1.46)	0.68	(0.43)	1.61	(1.47)	-.004
Wife's Work Outside Home							
Distance from home to work[h]	—	—	-10.07	(-1.00)	0.17	(0.03)	-.00001
No. hours[f]	—	—	-0.095	(-3.43)	0.042	(2.16)	-.0001
Wage Rates of Family Members[j]							
Wife	—	—	-7.07	(-1.30)	1.60	(0.42)	-.00001
Children (average)	—	—	-11.32	(-0.92)	-4.42	(-0.51)	.039
Husband	—	—	-3.40	(-0.76)	-2.23	(-0.72)	.002
Household owns a food-related business (dummy)	-169.89	(-1.18)	—	—	—	—	—
Constant	15.95		145.97		-11.75		.968
R^2	.188		.043		.228		.354
$\bar{R}^2$	.172		.021		.211		.340
Mean of dependent variable	480		313		100		.730

Note: For footnotes, see Notes to Appendix table 1.

Appendix Table 4. Determinants of Time Spent Cleaning

Explanatory Variables	Total Household Hours		Wife's Hours		Children's Hours		Wife's Proportion	
	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"
Household Composition								
No. children aged < 2	16.76	(1.52)	55.26	(2.78)	15.66	(0.78)	-.022	(-1.40)
No. children aged 2-5	19.00	(2.76)	11.64	(0.95)	23.31	(1.78)	.0011	(0.11)
No. children aged 6-10	3.96	(0.63)	2.16	(0.19)	6.10	(0.54)	-.009	(-0.95)
No. children aged 10-14	24.85	(3.86)	4.36	(0.38)	26.81	(2.31)	-.050	(-5.55)
No. children aged 15+	25.29	(4.43)	-10.15	(-0.98)	39.57	(3.79)	-.091	(-11.14)
No. relatives aged 15-49[a]	25.63	(4.22)	-7.59	(-0.67)	-9.23	(-0.81)	-.066	(-7.35)
No. relatives aged 50+[a]	24.03	(2.31)	-7.55	(-0.41)	-6.40	(-0.34)	-.071	(-4.79)
No. other Adults[b]	57.24	(0.99)	-13.23	(-0.13)	-2.43	(-0.03)	-.039	(-0.48)
No. servants	-46.41	(-0.62)	-38.39	(-0.28)	-42.06	(-0.31)	-.201	(-1.89)
Dummy = 1 if woman has husband[c]	-60.57	(-0.99)	45.19	(0.41)	43.67	(0.39)	.014	(0.16)
Area of Household's Residence								
Metropolitan[e]	6.12	(0.38)	28.34	(0.97)	16.36	(-0.55)	.033	(1.39)
Other town[f]	-5.41	(-0.35)	-4.70	(-0.17)	-14.31	(-0.52)	.016	(0.75)
East coast	9.31	(0.44)	18.12	(0.48)	6.10	(0.16)	.039	(1.30)
Education (Years of Schooling) of								
Wife	4.36	(2.17)	6.20	(1.71)	6.23	(1.69)	-.011	(-3.68)
Husband	2.08	(1.10)	-2.12	(-0.62)	-1.61	(-0.46)	.002	(0.61)
Race								
Chinese	-58.26	(-4.11)	-67.58	(-2.66)	-16.96	(-0.66)	-.090	(-4.44)
Indian	2.58	(0.13)	-36.08	(-0.98)	57.69	(1.55)	-.021	(-0.75)
Other than Chinese, Indian, or Malay	82.95	(1.61)	-14.21	(-0.15)	45.65	(0.49)	-.184	(-2.52)
Month of Interview								
August	-10.83	(-0.37)	-18.02	(-0.34)	13.68	(0.25)	.085	(2.03)
September	-52.44	(-2.11)	-8.89	(-0.20)	-78.98	(-1.76)	.125	(3.68)
October	-53.94	(-2.19)	-58.29	(-1.33)	-52.14	(-1.17)	.053	(1.51)
November	-61.20	(-2.48)	-78.35	(-1.78)	-78.18	(-1.75)	.095	(2.71)
Wife's Age	2.08	(2.29)	2.19	(1.33)	2.86	(1.71)	-.003	(-2.44)
Characteristics of House								
House provided by employer	24.26	(1.30)	69.17	(2.08)	50.87	(1.51)	-.010	(-0.36)
No. rooms	0.33	(0.09)	-2.47	(-0.36)	-0.94	(-0.13)	.006	(1.04)
Wife's Work Outside Home								
Distance[h]	---	---	-10.98	(-1.04)	1.39	(0.13)	-.018	(-2.14)
No. hours[i]	---	---	0.014	(0.50)	0.078	(2.65)	-.0001	(-6.17)
Wage Rates of Family Members[j]								
Wife	---	---	-7.10	(-1.25)	-6.56	(-1.14)	-.003	(-0.59)
Children (average)	---	---	-0.33	(-0.03)	3.84	(0.29)	.003	(0.29)
Husband	---	---	-1.60	(-0.34)	-1.97	(-0.41)	-.012	(-3.22)
Constant	29.46		84.43		-113.50		8.50	
R^2	0.113		0.038		0.075		0.333	
$\bar{R}^2$	0.095		0.014		0.053		0.317	
Mean of dependent variable	202		132		71		.680	

Note: For footnotes, see Notes to Appendix table 1.

Appendix

Table 5. Determinants of Time Spent on Childcare

Explanatory Variables	(1) Total Household Hours		(2) Total Household Hours		(3) Wife's Hours		(4) Husband's Hours		(5) Children's Hours		(6) Total Hours by All Except Husband and Wife[a]		(7) Wife's Proportion		(8) Husband's Proportion	
	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"	Coeffi-cient	"t"
Household Composition																
No. children aged < 2	528.49	(11.29)	526.16	(11.19)	293.22	(7.71)	53.23	(3.84)	60.65	(2.43)	0.51	(0.46)	.076	(4.08)	.024	(3.23)
No. children aged 2-5	212.52	(7.31)	209.83	(7.21)	148.60	(6.40)	14.74	(1.46)	56.62	(4.38)	0.48	(0.70)	.106	(9.25)	.009	(1.97)
No. children aged 6-10	117.81	(3.05)	118.74	(3.08)	21.90	(0.71)	-6.61	(-0.50)	37.79	(1.88)	0.70	(0.78)	.044	(2.84)	-.005	(-0.60)
No. children aged 10-14	47.02	(1.05)	44.60	(0.99)	29.99	(0.84)	-12.71	(-0.82)	85.45	(3.64)	1.26	(1.21)	-.040	(-2.22)	-.016	(-2.47)
No. children aged 15+	-80.49	(-3.35)	-76.45	(-3.13)	-65.98	(-3.40)	-16.09	(-1.91)	17.49	(1.38)	0.18	(0.32)	-.038	(-3.87)	-.008	(-2.27)
No. relatives aged 15-49[a]	11.07	(0.43)	30.82	(1.11)	-30.96	(-1.44)	-12.95	(-1.39)	-19.97	(-1.41)	-1.25	(-2.00)	-.021	(-2.01)	-.008	(-2.08)
No. relatives aged 50+[a]	-28.60	(-0.64)	-32.82	(-0.73)	-36.96	(-1.03)	-40.78	(-2.63)	-14.05	(-0.60)	-1.35	(-1.30)	-.079	(-4.47)	-.024	(-3.57)
No. other adults[b]	318.37	(1.32)	325.31	(1.32)	62.23	(0.32)	-49.76	(-0.59)	35.12	(0.28)	-2.43	(-0.43)	-.049	(-0.50)	-.040	(-1.09)
No. servants[b]	-55.44	(-0.17)	-43.29	(-0.13)	-147.86	(-0.57)	104.08	(0.93)	-65.88	(-0.39)	10.62	(1.42)	-.109	(-0.85)	.053	(1.08)
Dummy = 1 if woman has husband[b,c]	-347.98	(-1.36)	-363.13	(-1.38)	-20.76	(-0.10)	134.40	(1.51)	-32.58	(-0.24)	-1.35	(-0.23)	.089	(0.87)	.095	(2.44)
No. children in school[d]	-85.09	(-1.93)	-86.54	(-1.96)	-17.91	(-0.51)	-8.71	(-0.57)	-29.30	(-1.27)	-1.55	(-1.51)	.021	(1.22)	.002	(0.30)
Area of Household's Residence																
Metropolitan[e]	-56.12	(-0.79)	-54.89	(-0.76)	33.58	(0.59)	-16.56	(-0.67)	16.34	(0.44)	0.23	(0.14)	-.074	(-0.26)	-.003	(-0.30)
Other town[f]	54.42	(0.83)	61.08	(0.93)	20.05	(0.38)	-3.89	(-0.17)	79.18	(2.30)	-0.80	(-0.52)	-.015	(-0.55)	.002	(0.21)
East coast	-71.24	(-0.80)	-71.80	(-0.81)	121.98	(1.72)	31.89	(1.04)	-51.45	(-1.11)	-0.034	(-0.00)	-.005	(0.15)	-.019	(-1.37)
Education (Years of Schooling) of																
Wife	-9.97	(-1.16)	-8.83	(-1.00)	-5.30	(-0.76)	1.22	(0.40)	-0.80	(-1.80)	-0.079	(-0.39)	-.019	(-0.54)	-.0004	(-0.34)
Husband	3.96	(0.50)	4.73	(0.58)	0.22	(0.03)	-2.66	(-0.94)	-1.28	(-0.30)	0.042	(0.22)	.001	(0.39)	-.0004	(-0.34)
Race																
Chinese	219.98	(3.70)	220.90	(3.67)	86.39	(1.79)	-19.65	(-0.94)	-40.40	(-1.28)	2.01	(1.43)	-.098	(-4.10)	-.048	(-5.29)
Indian	377.17	(4.63)	370.92	(4.55)	116.30	(1.76)	39.93	(1.40)	24.71	(0.58)	2.45	(1.28)	-.074	(-2.24)	.002	(0.13)
Other than Chinese, Indian, or Malay	250.08	(1.15)	225.46	(1.03)	132.77	(0.76)	22.03	(0.29)	13.06	(0.11)	-2.30	(-0.46)	-.019	(+0.22)	-.016	(-0.32)
Month of Interview																
August	416.42	(3.35)	428.82	(3.40)	195.07	(1.96)	28.10	(0.65)	106.06	(1.63)	0.92	(0.32)	.059	(1.20)	-.009	(-0.47)
September	272.04	(2.60)	270.07	(2.56)	193.70	(2.31)	10.23	(0.28)	28.80	(0.52)	0.90	(0.37)	.089	(2.14)	-.012	(-0.78)
October	353.75	(3.44)	345.21	(3.34)	177.29	(2.16)	21.86	(0.61)	102.07	(1.90)	2.54	(1.06)	.084	(2.06)	-.003	(-0.21)
November	249.99	(2.43)	243.54	(2.35)	191.73	(2.31)	19.29	(0.54)	86.62	(1.60)	1.91	(0.79)	.041	(1.00)	.001	(0.80)
Wife's Age	-6.44	(-1.67)	-5.75	(-1.46)	-7.29	(-2.34)	-1.39	(-1.03)	0.48	(0.24)	0.23	(2.36)	-.003	(-1.91)	-.0008	(-1.38)

Table 5--Continued

Explanatory Variables	(1) Total Household Hours		(2) Total Household Hours		(3) Wife's Hours		(4) Husband's Hours		(5) Children's Hours		(6) Total Hours by All Except Husband and Wife*		(7) Wife's Proportion		(8) Husband's Proportion	
	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"	Coefficient	"t"
Type of Other Child Care																
(Dummy = 1 for each type used)																
Own children	273.61	(3.74)	280.58	(3.83)	4.82	(0.08)	24.86	(0.98)	299.01	(7.80)	27.45	(16.15)	-.079	(-2.71)	.0002	(0.00)
Wife's or husband's parents	261.33	(3.51)	267.30	(3.60)	52.91	(0.89)	-6.68	(-0.26)	66.60	(1.70)	32.80	(18.94)	.019	(0.64)	.003	(0.27)
Other relatives	226.37	(2.30)	208.84	(2.11)	-26.62	(-0.34)	18.02	(0.53)	-33.59	(-0.65)	29.02	(12.67)	-.055	(-1.41)	.010	(0.65)
Neighbors	215.16	(1.10)	216.07	(1.10)	-45.61	(-0.29)	164.45	(2.42)	-80.60	(-0.78)	36.25	(7.96)	-.189	(-2.43)	.071	(2.43)
Servants	444.96	(2.71)	499.35	(2.95)	235.36	(1.78)	-71.70	(-1.21)	54.76	(0.63)	44.13	(11.49)	.016	(0.25)	-.035	(-1.40)
Institutional help	251.21	(1.78)	254.65	(1.80)	191.47	(1.69)	142.67	(2.91)	357.94	(4.84)	49.18	(14.98)	-.056	(-1.01)	.025	(1.20)
Other	-51.87	(-0.24)	-44.79	(-0.20)	-15.56	(-0.09)	-35.38	(-0.47)	11.97	(0.10)	72.76	(14.44)	.036	(0.42)	-.020	(-0.63)
Wife's Work Outside Home																
Distance[h]	---	---	---	---	-17.63	(-0.88)	-5.35	(-0.62)	-9.45	(-0.72)	-0.74	(-1.26)	-.019	(-1.87)	-.003	(-0.69)
No. hours[i]	---	---	---	---	-0.17	(-3.11)	0.037	(1.56)	0.29	(0.80)	0.0056	(3.49)	-.0002	(-7.01)	.00002	(1.93)
Wage Rates of Family Members[j]																
Wife	---	---	---	---	-7.58	(-0.70)	-0.30	(-0.60)	-4.62	(-0.65)	0.61	(1.96)	.002	(0.32)	.003	(0.72)
Children (average)	---	---	---	---	-10.50	(-0.43)	6.31	(0.06)	3.53	(0.22)	-1.59	(-2.24)	.012	(0.99)	.003	(0.73)
Husband	---	---	---	---	1.14	(0.13)	-1.10	(-0.28)	6.72	(1.16)	0.013	(0.05)	.003	(0.58)	.002	(1.15)
Television																
(Dummy = 1 if household has TV)	23.70	(0.39)	21.71	(0.35)	19.02	(0.38)	34.19	(1.58)	7.86	(0.24)	-1.71	(-1.18)	.013	(0.52)	.016	(1.72)
Income																
Wife	---	---	-0.059	(-1.23)	---	---	---	---	---	---	---	---	---	---	---	---
Children	---	---	-0.034	(-1.58)	---	---	---	---	---	---	---	---	---	---	---	---
Husband	---	---	-0.0046	(-0.30)	---	---	---	---	---	---	---	---	---	---	---	---
Value of property	---	---	0.0008	(1.31)	---	---	---	---	---	---	---	---	---	---	---	---
Constant	-105.31		-118.79		304.02		104.54		-225.74		-1.97		.581		.173	
R^2	0.304		0.308		0.194		0.089		0.169		0.589		0.277		0.157	
$\bar{R}^2$	0.286		0.287		0.169		0.062		0.143		0.577		0.255		0.132	
Mean of dependent variable	816		816		522		89.9		116		16.4*		.506		.065	

Note: For footnotes a through i, see Notes to Appendix table 1.

*The dependent variable in column (6) is hours per week.