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FERTILITY AND RURAL DEVELOPMENT: PARTICIPATION
OF THE RURAL POOR AND EXTENSION OF SOCIAL SERVICES

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Curbing high fertility rates is one of the most important problems that the less developed countries of the world must overcome as they strive toward achieving the goal of sustained social and economic progress. It is imperative for those who are in policy making positions in these countries to understand the complexity of the problem as well as alternative courses of action that may be taken to overcome the problem. This understanding can be facilitated through an examination of the available evidence on those factors which either act to promote or discourage increased human reproductive behavior.

Since most of the less developed countries are rural in character, unraveling the complex and dynamic relationships between rural development processes and fertility behavior should promote a better understanding of and explanation for differential rates of fertility within and among these countries. The possibility that the successful completion of such a task may generate a firm foundation for the refinement and/or establishment of developmental and population policies directed toward achieving more desirable fertility rates would seem to be profound.

This task, however, is a complicated one given the apparent indirect nature of the relationships between rural development processes and fertility behavior. This means that one must necessarily take into account the impact that rural development processes have on fertility via a variety of social, economic, cultural, psychological, and biological variables which tend to have a more direct and immediate effect on fertility behavior.

The primary objective of this paper is to review and discuss the state of literature on the relationship between fertility and participation of the rural poor and extension of social services with regard to the less

developed countries of Africa, Asia, Latin America and the Near East. In this review, consideration will also be given to education as an intervening factor between fertility and the two rural development processes. This review will proceed with a general discussion of rural development and the rural development processes, the nature of the relationships that have been posted between fertility and participation of the rural poor and extension of social services, and a region-specific discussion of the impact of the rural development processes on fertility.

RURAL DEVELOPMENT

Rural development involves a set of processes designed to stimulate a sustained and generalized increase in the social and economic well-being of rural populations. That is, rural development activities should promote a more equitable distribution of and increase in income, education, employment opportunities, health and nutrition, and production and consumption of goods and services considered vital to the prosperity of rural populations (Kocher, 1973; Lele, 1975).

Lele (1975) suggests that there are three major features of rural development:

1. Improving the living standards of the subsistence population involves mobilization and allocation of resources so as to reach a desirable balance over time between the welfare and productive services available to the subsistence rural sector.
2. Mass participation requires that resources be allocated to low income regions and classes and that the productive and social services actually reach them.
3. Making the process self-sustaining requires the development of the appropriate skills and implementing capacity and the presence of institutions at the local, regional, and national levels to ensure the effective use of existing resources and

to foster the mobilization of additional financial and human resources for continued development of the subsistence sector. Self-suptenance thus means involving, as distinct from simply reaching, the subsistence populations through development programs.

It should be evident from this outline of the major features of rural development that the participation of the rural poor and the extension of social services are among several developmental activities which are considered to foster rural development and, hence, the overall social and economic well-being of rural populations.

Participation of the Rural Poor

Participation generally refers to one or more activities engaged in by an individual with other individuals or with groups. The nature of the participation as well as the activities may be broadly characterized as social, economic, or political. Each of these forms of participation and activity represent crucial aspects of the overall rural development process. Generating and sustaining the social and economic growth of rural communities require the participation of the intended beneficiaries of this growth in the planning, design, implementation, and evaluation of programs designed to achieve this end (Cohen et al, 1978).

The impetus for the study of participation largely evolved from the recognition by professional practitioners in community development programs that the success of such programs depends to a great extent on maximizing the involvement of those for whom the programs are intended.

The vast majority of the people in the less developed countries live under what has been termed "substandard living conditions," therefore, the participation of the rural poor in rural development programs and in the benefits which accrue from these programs is a crucial factor in determining the success

of rural development programs.

While there exists a large body of literature on the correlates of participation and the impact that participation has on community and rural development programs, there is a dearth of literature which specifically addresses the relationship between participation of the rural poor and fertility with the exception of economic activity participation. This should not be taken to suggest that other forms of participation do not have an influence on fertility behavior, rather, the principal focus of fertility studies in the less developed countries, involving participation as an independent variable, has been on economic activity participation of families and particularly women.

Extension of Social Services

The extension of social services, like the participation of the rural poor, is another rural development activity which is considered to be a vital factor in enhancing the overall well-being of rural populations in the less developed countries. There are many and varied types of social services presently being provided in these countries. These include literacy and manpower training, adult and vocational education, health and medical care, social security, and family planning programs. The extent to which these and other social services are actually reaching those for whom they are intended varies considerably within and among the less developed countries. Nevertheless, the extension of vital social services is a part of the modernization process which is proceeding at varying stages in the less developed countries. Modernization involves major alterations in the social, cultural, economic and political organization of a society and is seen as having significant implications for reducing fertility levels through increased opportunities for individuals and

families to become exposed or educated, formally and informally, to a wider range of new ideas and behavior patterns which are consistent with a desire to limit family size (Goldscheider, 1971; Easterlin, 1974; Miller and Inkeles, 1974).

Hypotheses advanced concerning the relationships between fertility and the participation of the rural poor in the development process and the extension of social services associated with this process are discussed in the following section. It should be noted here that in the review of the available fertility literature on less developed countries that almost none of the studies explicitly deal with participation of the rural poor and the extension of social services as determinants of fertility trends. However, many of the studies do contain variables which are more or less encompassed by the meaning sphere of participation of the rural poor and extension of social services. Furthermore, while the role of education has been acknowledged in theory and supported empirically as a critical factor in reducing fertility levels (Caldwell, 1968a, b; Kocher, 1973; Goldstein, 1972; Easterlin, 1974) most of the studies reviewed do not specifically focus on education as an intervening factor between fertility and participation of the rural poor and extension of social services.

INVENTORY OF HYPOTHESES

Participation and Fertility

One of the more comprehensive theoretical frameworks advancing the theme that participation of the rural poor in development will induce fertility decline is formulated by Kocher (1973). This researcher maintains that developmental programs and policies as well as domestic institutions must encourage and facilitate the widespread adoption of new agricultural technology by small

farmers as a means of increasing agricultural production in a diffused manner. Accordingly, increased and diffused agricultural production will produce improved and more equitably distributed incomes. As a consequence of the latter, a set of processes is activated which lead to improved standards of living and a modern life style for most of the rural population with widespread desire to limit family size. Among the processes suggested as promoting modern life styles are rising levels of education, health, sanitation and nutrition, increased consumption of material goods, and a greater investment in human and physical resources. Further, Kocher (1973) argues that sustained overall fertility decline can be enhanced by an efficient national family planning program.

This work clearly points to the importance of the participation of the rural poor in development as a means of generating a more equitable distribution of incomes which is a catalyst for bringing about more modern norms regarding family size and ultimately fertility decline among rural populations.

Several researchers have examined the impact of economic activity participation on fertility behavior (Carleton, 1965; Stykos, 1968; Goldstein, 1972; Chai, 1976; Aghajanian, 1978). Studies falling under this category generally suggest that economic activity participation may have differential effects on fertility depending upon the nature of activity and whether the activity takes place within the family or outside of the family.

Aghajanian (1978) argues that economic activity participation of rural families will produce a high level of fertility when: (1) the family is involved in agricultural production and is dependent upon income from this kind of activity and, (2) the size of the family landholding is large. These hypotheses are based on the assumption that agricultural production is the dominant economic activity in rural society with the family as the unit of

production and consequently high fertility is dictated by the economic value of children. This simply means that high fertility increases the family's labor supply which is needed for a sufficiently large size landholding.

Aghajanian (1978) further states that "as long as a woman's economic activity is within the family, such activity does not affect the fertility of the rural wife." This hypothesis is based on the notion that when a woman's economic activity is within the family, expenditure of time and energy away from the family is not required and, therefore, a relationship between fertility and this type of economic activity should not be expected.

Finally, the researcher indicates that education, particularly husband's education, should be regarded as an intervening variable between the economic activity variables and fertility. That is, education acts to reduce the perceived economic utility of children and, hence, fertility because of the changes in the life style and the occupational structure of the rural family that result from increased education.

Goldstein (1972) analyzed the relationship between fertility, labor force participation, and education in Thailand. The study focused upon women engaged in differential occupations and residing in rural and urban localities. The analysis pointed to a pattern of differential relations between labor force participation and fertility based upon rural urban locality of residence. Fertility among rural employed women was revealed to be somewhat higher than that among urban employed women. The major factor suggested by the researcher to account for this differential fertility pattern was that the urban employment context provided for a greater conflict between work and familial roles, whereas, this tended not to be the case in the rural employment context.

This is consistent with another finding of the study which indicates that women engaged in farming as an occupation have a higher level of fertility than those engaged in non-farming occupations.

Other studies which have theoretically and empirically examined the relationship between economic activity participation of women and fertility have reached similar conclusions (McGreevey et al., 1974; Ridley, 1959; Stycos, 1968; McCabe and Rosenzweig, 1976). The common and substantive conclusions are: (1) labor force participation of women tends to have a depressing effect on fertility among women who are employed outside of the family or in non-agricultural roles, (2) labor force participation in agricultural roles tend to have no marked effect on fertility, and (3) fertility increases when agricultural production is the primary economic activity of families. The explanation for the first two conclusions has to do with the degree of compatibility between work and familial (housewife and mother) roles. The explanation for the latter has to do with the economic utility or value of children in addition to the high social value that many cultures place on children.

These rather persistent conclusions of fertility studies in the less developed countries have lead some to suggest that female employment has a negative influence on fertility only under specific conditions and these conditions do not prevail in most less developed countries (McGreevey et al., 1974; Jones, 1977).

The role that education plays in the relationship between economic activity participation of women and fertility is often seen as one of facilitating opportunities for employment in non-agricultural roles which, in turn, lowers the fertility level (Carleton, 1965; Standing, 1978). However, education in a

non-formal sense may also act as an intervening factor between economic activity participation of women and fertility. That is, labor force participation, particularly in non-agricultural roles, and the income derived from such participation, afford women the opportunity to become exposed to a life style predicated on a limited family size. Therefore, depending upon whether one is considering education in a formal or non-formal sense in the relationship between labor force participation and fertility, education can be regarded as having a direct as well as indirect effect on fertility.

Extension of Social Services and Fertility

The degree to which social services are made available and rural populations take advantage of these services is a critical factor in altering high fertility rates in the less developed countries. The importance of the extension of such services as education and employment opportunities, public health and medical care, social security and family allowance programs, family planning, and mass media in influencing fertility has been noted by several researchers (Caldwell, 1968a,b; Yang et al., 1965; Easterlin, 1974; Hohm, 1976, 1976; Freedman, 1976; Carvajal and Geithman; Butz and Habicht, 1976).

Generally, social services accruing with the development process do not have an immediate and direct influence on fertility reduction. Some social services such as public health and medical care, when considered over the short run, even act to increase fertility. On the other hand, family planning as a social service is seen as having a unique and direct effect on fertility because of the potential immediacy of its influence on a family's decision to limit family size through the utilization of birth control techniques. Thus, in giving consideration to the impact that the extension of social services has on fertility one must take into account the differential effects that the

extension of particular social services have on fertility.

Public Health and Medical Care

In a theoretical analysis of the links between modernization and family reproductive behavior, Easterlin (1975) indicates that improved public health and medical care has two separate effects on fertility. First, the natural fertility of women is likely to increase given that healthier women are more likely to carry out a fetus to full term. Secondly, infants are more likely to survive to adulthood which means that the infant mortality declines. Therefore, at least initially, improved public health and medical care will increase the potential output of children, but eventually, according to Easterlin, public health programs induce a decline in fertility as families become aware of an excess fertility problem and as the motivation to regulate fertility emerges. In this regard, it has also been suggested that public health programs, coupled with a simultaneous strongly organized effort to stimulate birth control practices, would minimize the duration and magnitude of the phase of population growth induced by improved public health and medical care (Heer, 1970).

Butz and Habicht (1976) note that "the nations of the world exhibit in cross-section a strong negative association between health and nutrition, on the one hand, and fertility on the other." These researchers maintain that for particular individuals, the biological effects of health and nutrition on fertility tend to be positive but that for groups of individuals a negative relationship exists between health and nutritional status and fertility. They believe that well integrated programs of health, nutrition and family planning can aid less developed countries in reducing high fertility rates.

Social Security Programs

Social security programs in the less developed countries tend to differ

in terms of the level of benefits they provide and basis upon which benefits are provided. Given the variations in the nature of social security programs, there is reason to assume that such programs have a negative effect on fertility (Carvajal and Geithman, 1976; Hohm, 1976). On the basis of the assumption that without some form of governmental social security assistance, parents could be expected to have a large family size as a source of parental economic sustenance when they can no longer support themselves, Carvajal and Geithman (1976) hypothesized a negative relationship between fertility and household participation in the social security program of Costa Rica. These researchers add a note of caution that the Costa Rica social security program is an all inclusive one providing maternal and sickness benefits as well as disability and retirement benefits. As a result, they suggest that such a program can provide couples with an incentive to have children to the extent that parents do not have to pay for maternity or medical services and, thus, the assumed long term negative effect of the social security program on fertility can be offset by a short term positive effect.

In an analysis of the effects of family allowance programs on fertility levels, Hohm (1976) advanced the following hypotheses: (1) the association between family allowance programs (as indicated by coverage and benefit levels) and fertility is expected to be inverse and (2) controlling for the effects of other variables indicative of economic development, the independent effect of coverage and benefit level of family allowance programs on fertility is expected to be minimal. Family allowance was defined as regular payments to parents based on the number of children in the household. Coverage and benefit level were defined as how well a program covers the children in a given country and the size of payments on behalf of a child, respectively.

Hohm (1976) established these hypotheses on the basis that demographic research has consistently indicated that economic development is negatively associated with fertility and because there is reason to believe that as countries develop economically they tend to establish family allowance programs to deal with the new situation that families find themselves involved. It should be noted that Hohm does not view the relationship between family allowance and fertility as causal but spurious because the ability of countries to provide adequate family allowance programs in terms of wide coverage and high benefit levels is dictated by their level of economic development.

Education

The extension of education has often been cited as a means of reducing fertility in less developed countries and evidence from cross national studies largely supports the existence of a negative relationship between education and fertility (Caldwell, 1968a, b; Goldstein, 1972; McGreevey et al., 1974; Kocher, 1976; Janowitz, 1976; Holsinger and Kasarda, 1976).

The relationship between education and fertility is not a simple one to one relationship and there is considerable debate among scholars concerning the specific causal mechanisms that link education with fertility reduction (Janowitz, 1976; Holsinger and Kasarda). There are a number of specific causal mechanisms which have been suggested to intervene in the education-fertility relationship. These have been summarized by Holsinger and Kasarda (1976) in the following hypotheses:

- (1) Formal schooling delays age at marriage and thereby reduces the total possible number of child-bearing years of life.
- (2) Education provides directly or facilitates the acquisition of information on modern contraceptive devices and use.

- (3) Education increases exposure to mass media and printed materials concerning family planning.
- (4) Education increases aspirations for upward mobility and the accumulation of wealth, which reduces the desirability of children.
- (5) Schooling enhances a girl's prospects for obtaining employment outside the home that competes with bearing and rearing children as a career.
- (6) Education reduces the perceived economic utility of children, thus lowering the demand of parents for them.
- (7) Schooling affects communication between husbands and wives in ways that are conducive to lower fertility.
- (8) Schooling affects fertility by reducing infant and child mortality.
- (9) Schooling imparts a sense of self-efficacy, control over one's own fate, trust in science and technology, all of which promote the use of contraception as a rational means of controlling one's life and destiny.

Although Holsinger and Kasarda (1976) includes these hypotheses under the category of indirect effects of education on fertility, it would appear that hypotheses 2 and 3 are more indicative of a direct effect of education on fertility in that education is regarded as contributing to knowledge and practice of birth control techniques.

Education is also an indicator of socio-economic development of a country and, as a consequence, not only influences modernization at the individual level but at the societal level as well. At the societal level, education interacts with other variables (i.e. urbanization and industrialization) indicative of development to bring about a shift from high to low fertility rates (Miller and Inkeles, 1974; Easterlin, 1974; Holsinger and Kasarda, 1978; Mauldin and Berelson, 1978; Cassen, 1978).

Family Planning

Unlike other social services, family planning is a direct intervention that governments can make to reduce their rates of population growth. Family planning programs are designed to foster the acceptance of small family norms through the provision of information and education to couples on the advantages of small family size and on appropriate techniques of contraception that may be used to limit family size. Depending upon the degree of success of family planning programs in spreading knowledge of birth control practices and in influencing attitudes and behavior toward their use, these programs can be regarded as having a direct, causal, and immediate effect on fertility decline (Cornelius and Speidel, 1978).

There is some controversy among scholars and policy makers concerning whether or not family planning programs operate more effectively and efficiently to limit family size than social and economic development programs (Birdsall, 1977; Tsui and Bogue, 1978; Brackett et al., 1978). It is believed by some that increasing the social and economic well-being of rural populations is the single most important force in bringing about fertility declines in the less developed countries. For example, Brackett et al. (1978) indicate that an assertion often made is that rural women who are poor and uneducated will not desire to limit their fertility until they have experienced better education and employment opportunities outside the home and particularly outside of agriculture. There is also the assumption that many less developed countries are so highly pronatalist that family planning programs cannot be expected to have a significant impact in reducing fertility rates, but the same has been said about modernization and development programs. That is, fertility has not responded to increasing modernization of many less developed countries because

of powerful pronatalist religious institutions and cultural groups (Cutright et al, 1976; Tsui and Bogue, 1978).

The view which has perhaps received the greatest consensus is that modernization or development alone will not stimulate and accelerate fertility declines and that organized family planning, making modern means of birth control widely accessible, is also essential if progress is to be made in rapidly reducing fertility (Brackett et al., 1978; Cornelius and Speidel, 1978; Mauldin and Berelson, 1978; Tsui and Bogue, 1978).

Mauldin and Berelson (1978) argue that from a broad perspective, fertility can be seen as a function of both demand and supply factors with the former affecting the level of motivation for fertility control and the latter affecting the availability of information and services for fertility control. According to these researchers, in terms of science, demand represents basic development determinants (i.e. socio-economic, cultural, and socio-structural factors) that give rise to interest in limiting family size and supply represents one of the intermediate factors or mechanisms through which demand gets expressed in actual behavior. This argument tends to be consistent with the assertion that development can influence the fertility of a couple only through two broad mechanisms: "(1) by changing the timing, frequency, duration, and nature of sexual union by such means as delay and dissolution of marriage, separation of mates or abstinence, (2) changing patterns of the availability and use of means of fertility regulation (i.e. contraception and abortion)" (Brackett et al., 1978).

Thus, it might be concluded that in reducing the fertility rates of the less developed countries that there is not an either/or situation with regard

to development or family planning as basic determinants but both are important in bringing about fertility declines. Recent macro studies of fertility decline in developing countries lend support to this conclusion (Mauldin and Berelson, 1978; Tsui and Bogue, 1978).

REGION-SPECIFIC DISCUSSION

Studies of fertility and its correlates have been conducted throughout the world, however, this section will focus on fertility studies in the developing regions of Africa, Asia, Latin America and the Near East. More specifically, this discussion will seek to highlight the extent to which participation of the rural poor in development activities and the extension of social services have had an impact on fertility rates in countries of the developing regions.

Recent data on fertility rates in the developing regions indicate that substantial fertility decline has occurred in many of the developing countries of Asia and Latin America, some decline in North African countries, and very little to no decline in the sub-Saharan African countries. Some of the more important factors which are believed to account for the differential rates among regions and countries include improved and wider employment opportunities for women, education, urbanization, males in the non-agricultural labor force, increased life expectancy, mortality declines, and increased practice of family planning (Mauldin and Berelson, 1978; Cassen, 1978; Tsui and Bogue, 1978).

As stated earlier, most studies of fertility in the less developed countries have not explicitly sought to determine the impact of participation of the rural poor and the extension of social services on fertility rates in these countries. However, one might conclude that since these processes are a part of the overall modernization or development process that commonly

employed measures of development should provide some indication of the degree to which these processes have influenced fertility behavior in countries in which the vast majority of the people are rural and poor and in need of varied social services.

Thus, the discussion to follow will review selected studies conducted in each of the developing regions which have sought to provide an explanation of fertility behavior based upon developmental factors indicative of participation of the rural poor and extension of social services.

AFRICA

One analysis of recent evidence of population change in Africa indicates that several countries have experienced a rise in fertility and in those countries in which fertility is somewhat lower it does not appear that they have reached a threshold of a sustained fertility decline (Cassen, 1978). According to Cassen, the population prospect for Africa is one of continued population growth at very high rates for at least the next two decades. Cassen cites three areas that demand attention if rising fertility rates in African countries are to be curtailed: (1) improving health through widely diffused health services and better living conditions; (2) increasing education to help facilitate change in traditional attitudes toward childbearing, and (3) stressing the fact that longer birth intervals and fewer births improve the survival chances for both mother and child through family planning programs. Improving health conditions is considered to be an urgent requirement because the extremely high rates of infant and child mortality are believed to be among the major factors accounting for the high fertility rates in African countries.

Clearly, these areas which Cassen (1978) suggests demand attention point to the significance that greater participation of the rural poor in development and extension of social services can have on reducing fertility rates in African countries. Studies of fertility within several African countries tend to lead one to a similar conclusion.

In a study on the determinants of fertility among the Yorubas of Nigeria, Arowolo (1976) attempted to identify the preconditions for widespread and effective use of modern methods of fertility control. Among the assumed determinants of fertility examined, Arowolo found that: (1) lowered mortality does not appear to have any relationship with reduced fertility; (2) education appears to exert a depressing influence on fertility; (3) occupation, to a limited extent, affects fertility with women in more professional occupations having fewer children than those engaged in farming and trading; and (4) religious affiliation does not greatly differentiate fertility levels.

Arowolo indicates that not only is fertility high among the Yorubas but the number of children considered ideal by women is equally high. He concludes that, initially, family planning should be directed to urban, educated and well-motivated couples rather than rural populations because it may be objected to on social and moral grounds, but eventually family planning programs should be integrated with medical care and extended to both rural and urban areas.

John Caldwell (1968a) examined the effects of the extension of education on fertility in Ghana. Caldwell suggests that education can affect fertility in two distinct ways. First, education may make the individual decide on some type of family limitation and secondly, the cost of keeping a child in school

may exert pressure on the parental generation to keep family size small. Caldwell indicates that direct confirmation of the former is not easily obtained but that quantitative evidence in Ghana tends to support the latter.

With regard to the educated generation in Ghana, according to Caldwell, there is an inverse association between education and fertility. He concludes that:

The major impact of education in bringing about lower fertility operates through such factors as changing the type of marriage, altering the relationship between spouses, intensifying the concern of parents for things within the family, making new forces of knowledge accessible, making communication between spouses on non-traditional matters easier and rendering non-traditional behavior patterns easier to adopt.

In a second study, Caldwell (1968b) investigated family size in tropical Africa which included the countries of Senegal, Ghana, Nigeria, and Kenya. He found that very similar patterns of fertility change existed in each of the countries surveyed. A major finding was that the existence and length of formal education is a major determinant of fertility behavior patterns. Education is seen as having influenced attitudes toward family size, knowledge of contraception, and use of contraceptives. Further, Caldwell found that in areas of predominantly traditional culture and agricultural practices, the various indicators of potential fertility control were at their lowest intensity. Also, participation in religious sects appears to account for fertility differentials with Moslems exhibiting higher levels of fertility than Christians.

James Kocher (1976) attempted to identify and measure some of the important changes that have occurred and are occurring in four rural areas in northeastern Tanzania and to identify the interactions of these changes with

fertility. He was specifically interested in testing the hypothesis that social, cultural, economic changes, typified by modernization, may lead to the widespread practice of modern contraception and, as a result, widespread and sustained fertility decline. Kocher surveyed two areas in Lushoto and two areas in Moshi and concluded that:

Many social, cultural, health, educational and economic changes have taken place in all four study areas since about the beginning of the century. . . It is equally clear that the types of changes that have occurred, the rates of change, and the extent to which changes have permeated and transformed the societies in each area have been markedly different.

It appears that the people of the Moshi area are much more progressive than those of the Lushoto area.

All four areas seem to have experienced rising survival rates and rising average numbers of surviving children, however, only about a fourth to a third of the Lushoto area residents are aware of the change as compared to most of the Moshi residents. Other social and cultural changes taking place are the increasing number of persons becoming Christians, the rise in the average age at marriage (which is associated with increased education), and the incidence of polygyny has declined. Kocher indicates that it is still unclear as to what the net effect of these social and cultural changes have on fertility but that some changes in fertility can be observed and they are: (1) on the average, women bear children at later ages in the Moshi area; (2) birth intervals are declining; (3) only half as many Moshi area residents as in the Lushoto area value large numbers of children for the work they provide; and (4) the proportion of parents in the Moshi area feel that they now have or are likely to have more surviving children than they desire.

Although for many of the sub-Saharan African countries fertility

rates do not appear to be declining there is some indication based upon the studies reviewed that with continued social and economic development that high fertility trends may be reversed provided that more social services (i.e., health and medical care, education, family planning) and greater opportunities for employment outside of agriculture are extended to rural areas and rural residents are mobilized to take advantage of the services offered.

ASIA

The developing region of Asia has experienced a greater reduction in fertility rates than any of the other developing regions (Mauldin and Berelson, 1978). A review of selected studies of fertility in Asia will perhaps shed some light on the reasons for this situation. The studies deal with three major variables (labor force participation, education and family planning) which have been suggested to have negative effects on fertility.

Goldstein's (1972) study of fertility in Thailand examined the extent to which female labor force participation and education have negative effects on fertility. Goldstein found that a differential relation existed between labor force participation and fertility in rural, agricultural places and the urban center of Bangkok. Fertility was higher among rural women and women engaged in farming. Regardless of residence category, Goldstein found that education had a negative influence on fertility. Accordingly, this researcher argues that policies directed at fostering greater participation in the non-agricultural labor force, encouraging high rates of educational enrollment of women and greater exposure to an urban way of life should be a part of any program designed to achieve reductions in fertility.

In a similar study, Lee Hyo and Cho Hyoung (1976) analyzed the demographic characteristics of the Korean female population with special attention directed toward measuring the interrelationships among their age, marital status, fertility, labor force participation, and educational and residential characteristics. The researchers reported as their major findings the following:

- (1) After controlling for the effect of age, there appears an inverse relationship between levels of women's educational attainment and fertility.
- (2) Women in urban areas show lower fertility levels under all circumstances than do rural women.
- (3) Contrary to what was expected, there appeared a slight, but positive relationship between fertility and women's labor force participation. Working mothers tend to have a higher fertility than non-working housewives, and, mothers with large numbers of children are more likely to be in the labor force than women with fewer children.
- (4) However, this pattern is largely determined by the fact that the female labor force, especially the ever married portion, is predominantly rural and employed in the agricultural sector. Among employed women in the urban, non-agricultural sector, a negative relation between fertility and labor force participation is found.

These findings are largely consistent with those of other studies in different localities focusing on the relationship between similar variables. The slight positive relationship found between labor force participation and fertility is not too surprising given that a significant proportion of women were engaged in agricultural occupations where conflicts between mother-worker roles are less likely to evolve.

The last two Asian studies to be reviewed are concerned with the impact of family planning on fertility. Shevasunt et al. (1978) examined the relationship between family planning and fertility in two rural northern Thailand provinces, Chiang Mai changwat and Chiang Rai changwat. These provinces were

selected by the researchers because they were interested in determining whether widespread adoption of family planning and/or fertility declines have taken place among a population that has not undergone substantial social and economic development. Most residents of the study areas do not have more than four years of schooling and are engaged in subsistence agriculture. The researchers indicate that nearly all of the contraceptive protection experienced by women in both provinces are a result of the activities of the National Family Planning Program, McCormick Hospital (in Chiang Mai), the Community-Based Family Planning Services (in Chiang Rai), and other NFPP affiliated private organizations. Moreover, the researchers believe that fertility declines are a result of the family planning services because the declines occurred with the initiation of such services. Also, the largest fertility decline occurred in married women aged 25-34, the same women who are the greatest users of contraceptives. Finally, the researchers found that the high rates of contraceptive practice and the declines in fertility are pervasive among women at all educational levels, however, the fertility rates of illiterate women are moderately higher as their rates of contraceptive usage are correspondingly lower than for women at all other levels of education.

In an analysis of fertility and family planning in rural Korea, Yang et al. (1965) report the results of a research project designed to demonstrate and assess the effect of family planning educational and clinical services on fertility rates in two rural Korean townships. Data are analyzed from two surveys of a random sample of residents in each of the townships. The first survey covered attitudes and practices related to family planning. The second survey, conducted after over a year of intensive family planning

programming in the townships, focused on changes in contraceptive rates and in the practice of contraception. Both townships were similar in size and characteristics, however, the family planning program in one of the townships (experimental area) was more intensive than in the other (control area). Forty five percent of the eligible women participated in the contraceptive program of which seventy four percent were active users at the time of the evaluation. Acceptance was highest among women 25-39 years of ages. Women with two sons and women with three or more children had a higher acceptance rate. Acceptance increased fourfold in the experimental area as a result of the program. Also, the researchers note that increased acceptance (from 11 to 22 percent) in the control area indicates the effectiveness of the National Family Planning Program. The crude birth rate declined 10 points in the experimental area as compared with 7 points in the control area. Finally, the researchers suggest that it is not clear whether the decline was due to contraceptive or abortion, but that the decline does point to a desire for family size limitation.

LATIN AMERICA

Based upon recent evidence on fertility trends in Latin America, it appears that the majority of countries in this developing region have experienced some decline in fertility but several of these, including two of the largest countries--Brazil and Mexico, have experienced only modest reductions in fertility (Cassen, 1978; Mauldin and Berelson, 1978).

In his book on fertility in Latin America, Stycos (1968) analyzes assumed correlates of fertility in several Latin American countries. These correlates include family planning, mass media exposure, education, and female employment. With regard to family planning in Puerto Rico, Stycos states that birth control clinics have as yet had no significant effect on the birth

rate largely because they are not used by most of the population and those who do acquire contraceptives from the clinics do not use them systematically. Further, it was found that mass media plays a relatively minor role in determining the opinions and knowledge of large numbers of people regarding birth control. Word-of-mouth communications via primary groups and/or local opinion leaders appear to be of greater importance in areas where illiteracy is high and levels of living are low.

Stycos also discusses the Caribbean Fertility Studies which focused on the residents of Puerto Rica, Jamaica and Haiti. A positive correlation was found to exist between knowledge of birth control and discussion of family size preferences in Jamaica. In Puerto Rica, women prefer small families. Also, Puerto Ricans are relatively knowledgeable about birth control methods, have relatively positive attitudes toward family planning, and have an excellent public system of clinics, however, they have not taken advantage of family planning for several possible reasons, according to Stycos. First, there tends to be absence of discussion of birth control by Puerto Ricans. In Haiti, almost knowledge about contraception is not pooled. Finally, the issue of family planning does not yet have high salience for Puerto Ricans. In Haiti, almost three fourths of those interviewed said that the number of children one had was determined by God or chance. Therefore, Stycos feels that the "only hope lies in raising educational levels and economic opportunities to a certain minimum point at which self-improvement seems both possible and desirable."

Stycos investigated the relationship between female employment and fertility in Peru. He found that the mean birth order by age or mother is virtually identical for housewives and service workers. Mothers classified in professional and technical categories had fewer births than the previous mentioned groups. There was no difference in fertility rate by employment

status of upperclass women. It appears that upperclass working women have somewhat higher sensitivity than nonworking women to the economic effects of additional children, and working women with four or more living children are less likely than others to want additional children.

Additionally, Stycos considers the role that education plays in the level of fertility in Latin America. He states that "education seems to possess little of the magic character often attributed to it with respect to fertility." Rather, it seems that lower birth rates are more explicable in terms of greater urbanization. Peruvian women showed little differential fertility prior to the completion of primary school while census data from Puerto Rica showed marked differential fertility by education. It appears that declines in fertility occur only after elementary school is achieved. Stycos concludes that education alone will not serve as a panacea for the population problems in Latin America given that in the mid-fifties it was found that only about one of every four or five Latin Americans who began school completed the elementary and only one in twenty completed secondary school.

Carleton (1965), using 1950 census data provided by the U. S. Bureau of the Census for the Puerto Rican Planning Board, examined the extent to which labor force participation of women was a stimulus to fertility decline in Puerto Rico. He found that a relatively large proportion of women were in responsible jobs and that women who were economically active had a higher level of education than those who were not. Women with more education had fewer children and, therefore, were more free from household responsibilities. Further, the census data showed very sharp educational differentials for both urban and rural women. It appears that there is not very much difference in fertility until eight years of schooling have been completed. Also, the analysis suggests that there is not

much difference in fertility between high school graduates and women with a higher education.

Carvajal and Geithman (1976) sought to determine the impact of socio-economic factors (i.e., family income, female employment, presence of the extended family, social security system participation, and home ownership) on fertility decline in Costa Rica between 1963 and 1973. The data were organized according to socio-economic reference groups (SORGs) of families. Some of the major findings of the study were summarized as follows:

- (1) Lower-status families have larger families than higher-status households in every age grouping.
- (2) The Costa Rican fertility decline during the 1963-1973 decade was centered within the youngest age groups; greatest fertility decline occurred for members of the highest SORGs.
- (3) Increases in family income raise measured fertility levels.
- (4) Increases in female's labor force participation tend to reduce family size.
- (5) A large-size extended family reduces measured fertility.
- (6) Location of the household in an urban environment, other things being equal, tends to diminish family size.
- (7) Membership by the head of household in the Costa Rican social security system generally raises measured fertility. An exception was a negative association in 1963 for the highest SORGs.
- (8) Improved levels of household sanitation are associated with higher fertility levels.
- (9) Family ownerships of dwelling place tends to raise family size.

Based upon these findings the researchers made two important recommendations to enhance fertility decline in Costa Rica. One is to provide more opportunities for females to participate in the labor force outside of the home and the other is equalizing the incomes of families in Costa Rica.

Faundes-Latham et al. (1968) investigated the effect of a family planning program on fertility in Santiago. The fertility decline in 1966, which the researchers attributed to the effects of the first year family planning program, was the largest of the years sampled. It was suggested that the family planning reduced fertility because it gave only highly effective contraceptives to the women who attended the clinic and succeeded in selecting women in the age range (20-35 years) with the highest previous fertility in the community and thus prevented a considerable number of births through the protection of relatively few women. Faundes-Latham et al maintain that some of the 1966 decline may be due to "extra program factors," such as a general change in attitudes toward and practice of modern contraceptives. However, the researchers do conclude that even with other intervening factors, the family planning program still should be credited with the major responsibility for change in fertility.

NEAR EAST

Aghajanian's (1978) study of fertility and family economic activity in Iranian rural communities was the only study included in the literature review which dealt with a specific country in the Near East Region. This study tested four propositions regarding fertility and size of family landholding, family involvement in agricultural production, economic activity of women within the family and the intervening role of education and age at marriage in the relationship between fertility and the economic activity variables.

Aghajanian found that there exists a high level of fertility as well as considerable variation among couples in the Iranian villages. Differential fertility by education, occupation, and size of landholding was observed. In the agrarian communities, where the family is the predominant economic unit,

a positive relationship between fertility and size of landholding was found which is interpreted as being largely due to the demand for the productive services of children. It was reported that large landholders have the highest level of fertility among the farmers even when other factors were controlled. The study further shows that the effect of the wife's economic activity on fertility of rural couples is negligible and perhaps so because of the absence of work and mother-household role incompatibilities. The study did not consider the influence of wife's education since few women were literate but did consider the husband's education which was interpreted as having an indirect effect on fertility because an increase in education may lead to a change in occupation from farmer to non-farmer. That is, "education reduces fertility of farmers through its impact on perceived economic utilities of children." Aghajanian also feels that education may stimulate a more positive attitude toward effective use of modern birth control techniques.

CONCLUSION

There still remains a great deal of theoretical and empirical research to be done before the nature and strength of the relationship between rural development processes and fertility behavior in the less developed countries can be clearly specified. Although demographic transition theory maintains that over the long run social and economic development should lead to a decline in fertility, we still do not know with a reasonable degree of certainty the relative importance of variables which define development and particularly rural development in bringing about a shift from high to low fertility rates. One of the major reasons for this state of affairs has to do with the lack of an adequate conceptualization of rural development processes and, of course, this has significant implications for accurately measuring concepts which are indicative of rural development processes. For example, while there is a general recognition in the literature that the participation of the rural poor in the social and economic development of a country is necessary for achieving sustained fertility decline we could not locate studies which actually conceptualized and measured the impact of the participation of the rural poor in development programs on fertility. This is unfortunate since we know empirically that the high birth rates in many developing countries can be largely attributed to families in the lowest economic strata of these countries. There is an urgent need for researchers to go beyond assuming that the participation of the rural poor in development has a negative influence on fertility to empirically ascertaining the extent to which such participation contributes to fertility decline.

In regard to the extension of social services, there is a body of documented evidence to support the contention that the availability of particular social services in rural communities do have an effect on fertility.

Some of these social services such as family planning and education tend to have more of an immediate impact on fertility decline than do others. Well-organized and nationally supported family planning programs have been quite influential in several developing countries in reducing fertility rates. The extension of opportunities for increased education beyond primary school has also contributed to fertility decline through such factors as delayed age at marriage, greater sensitivity to and knowledge birth control techniques and practices, transformation of traditional attitudes and values regarding family size, and facilitation of employment opportunities of women outside of home and outside of agriculture in particular. Finally, improved public health and medical care and social security programs have been shown to increase fertility initially but over the long run both tend to reduce fertility when their effects are combined with those of other developmental factors that contribute to improved living conditions.

Aghajanian, Akbar

1978 "Fertility and Family Economy in the Iranian Rural Communities." *Journal of Comparative Family Studies* 9:119-127.

The author develops and empirically examines four propositions concerning the relationship between economic activity of rural families and fertility. The economic activity variables posited as having an influence on fertility are: (1) the degree of family involvement in agricultural production, (2) size of family landholding, and (3) economic activity of women within the family. Education and age at marriage are considered as intervening factors between economic activities and fertility levels of families.

Arowolo, Oladele O.

1976 "Determinants of Fertility Among Yorubas of Nigeria," *Recent Empirical Findings on Fertility: Korea, Nigeria, Tunisia, Venezuela, Philippines. Occasional Monograph Series No. 7, Interdisciplinary Communications Program, Smithsonian Institution.*

An analysis of the impact of socioeconomic and life history variables on fertility based on a survey of 654 Yoruba households in rural and urban areas of southwestern Nigeria. The independent variables included: education, occupation, religious affiliation, and infant and child mortality. Only education was found to have a significant and depressing effect on fertility.

Birdsall, Nancy

1977 "Analytical Approaches to the Relationship of Population Growth and Development." *Population and Development Review* 3:63-102.

The author reviews the major analytical approaches to the study of the relationship between population growth and economic development. Research on the macro and micro determinants and consequences of fertility is discussed along with the policy implications associated with each of these lines of research.

Brackett, James W., R. T. Ravenholt and John C. Chao

1978 "The Role of Family Planning in Recent Rapid Declines in Fertility in Developing Countries: Some Findings from the World Fertility Survey." A paper presented at the Meeting of the Population Association of America, Atlanta, Georgia.

In this paper, data from the World Fertility Survey are examined to measure the impact of family planning and socio-economics development factors on fertility control in ten developing countries--

Columbia, the Dominican Republic, Fiji, South Korea, Malaysia, Nepal, Pakistan, Panama, Sri Lanka and Thailand. The analysis of the data revealed that, despite broad differences in geography, culture, religion, race and socio-economic development, a large proportion of women in every country do not desire any more children.

This desire was found to be strong among rural, poor, and not very well educated women in all countries. The authors conclude that socio-economic development is not a dominant factor in terms of the desire for fertility control by the populations, except among the poorest where the sheer survival of the existing family dictates the need to control further fertility. The role of family planning in at least eight of the ten countries is considered to be a prime factor accounting for fertility control and ultimately the declining rate of fertility in these countries.

Butz, William P. and Jean-Pierre Habicht
1976 "The Effects of Nutrition and Health on Fertility: Hypotheses, Evidence, and Interventions." Pp 210-238 in Ronald G. Redker (ed.), Population and Development: The Search for Selective Interventions. Baltimore: Johns Hopkins University Press.

A review of the evidence regarding biological and behavioral effects of nutrition and health factors on fertility. The authors present a model to predict variations in fertility that result from changes in nutrition and health. The implications of available evidence for choosing among modes of delivering health, nutrition, and family planning services are discussed along with research questions whose illumination would assist governments in making choices among alternative policy interventions.

Caldwell, John C.
1968 "The Demographic Implications of the Extension of Education in a Developing Country: Ghana." Population Association of America Annual Meeting, Collected Papers 6:18-29.

The author analyzes the impact that the rapid extension of education in Ghana during the period 1948-1960 has had on demographic behavior. Among the demographic behavioral variables considered in relation to the extension of education are rural-urban migration, parental generation fertility, desired family size, delayed marriage, conscious reduction of marital fertility, family planning and mortality. It is suggested that the existing associations between education and demographic behavior are so strong that the continuing extension of education in the country will undoubtedly have the profoundest effects on population phenomena. However, the author notes that the major impact of education in reducing fertility operates through factors such as changing marriage forms, alterations in the relations between spouses, intensifying

the concern of parents for things within the family and making new forces of knowledge accessible.

- Caldwell, John C.
1968b "The Control of Family Size in Tropical Africa." *Demography* 5:
589-619.

This study analyzes family planning knowledge, attitudes, and practices based upon available survey data from West and East African countries. The data are representative of rural and urban residents of both regions of Africa. The author concludes that the existence and length of formal education has been a major determinant of fertility behavior patterns. Education is seen as having influenced attitudes toward family size, knowledge of contraception, and use of contraceptives.

- Carleton, Robert O.
1965 "Labor Force Participation: A Stimulus to Fertility in Puerto Rico?" *Demography* 2:233-239

This study contains cross-tabulations of census data provided by United States Bureau of the Census for the Puerto Rican Planning Board. Includes statistical tables on the rates of fertility among married Puerto Rican women, considering age, years of school completed and economic activity. The author examines the association between economic activity and fertility rates of married Puerto Rican women in order to account for the apparent fertility decline in the area.

- Carvajal, Manuel J. and David T. Geithman
1976 "Socio-economic Fertility Determinants in Costa Rica 1963-1973,"
New Perspectives on the Demographic Transition. Occasional
Monograph Series No. 4, Interdisciplinary Communications Program,
Smithsonian Institution.

"An economic model of fertility is used to help explain the decline in fertility in Costa Rica between 1963 and 1973. Data are provided by both Costa Rican censuses and a mid-1960's CELADE fertility survey." The data were organized into socio-economic reference groups (SORGs) of families. The influence of family income, female participation in the labor force, presence of the extended family, urban-rural location of the household, participation in the social security, sanitation facilities in the household, and home ownership on fertility was examined. "A major finding of the study is that while income and fertility are negatively related between social classes, the relationship is positive within a given social class."

- Cassen, Robert H.
1978 "Current Trends in Population Change and Their Causes." *Population and Development Review* 4:331-353.

A survey of current trends in population change in the major regions of the developing world. Supporting evidence is provided for some of the socio-economic development factors, including family planning effort, that are considered as determinants of fertility differentials within and between the developing regions and countries.

Chai, Lee Hyo and Cho Hyoung
1976 "Fertility Women's Labor Force Participation," Recent Empirical Findings on Fertility: Korea, Nigeria, Runisia, Venezuela, Philippines. Occasional Monograph Series No. 7, International Communications Program, Smithsonian Institution.

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

Cohen, John M., Gladys A. Culagovski, Norman T. Uphoff and Daniel L. Wolf.
1978 Participation at the Local Level: A Working Bibliography. Ithaca, New York: Rural Development Committee, Center for International Studies, Cornell University.

An extensive bibliography on participation at the local level. Studies are grouped under the following major headings: Participation and Development, Local Organization, Local Leadership and Elites, Political Participation, Political Factors Affecting Participation, Social Factors Affecting Participation, Institutional Contexts of Participation, Participation and Community Development, French Sources on Participation and Spanish Sources on Participation. Studies under the latter two headings are annotated.

Cutright, Phillips, Michael Hout, and David R. Johnson.
1976 "Structural Determinants of Fertility in Latin America." American Sociological Review 41:511-527.

"Theoretical arguments that structural modernization reduces fertility rates are reviewed and empirical work discussed. The view that Latin American fertility has not responded to increasing modernization because the Roman Catholic Church is a powerful pronatalist institution is tested with a historical model. Characteristics of Spanish rule before 1830 and 19th century immigration patterns are determinants of the level of modernization and Catholic institutional strength in 1900. Modernization

reduces crude birth rates in 1910 and later years and also depresses illegitimate and marital fertility. A strong negative effect of Catholic strength on illegitimacy is counter-balanced by its strong positive impact on marital fertility."

Easterlin, Richard A.

1974 "The Effect of Modernization on Family Reproductive Behavior." Pp. 263-288 in the United Nations (ed.), *The Population Debate: Dimensions and Perspectives*, Papers of the World Population Conference, Bucharest.

This paper provides a theoretical examination of the nature and causes of the change in family reproductive behavior associated with modernization. The paper consists of four sections. The first section discusses the meaning of modernization and describes the changes in family reproductive behavior associated with it. The second presents a theoretical framework for analyzing the determinants of family reproductive behavior. In the third and fourth sections, the causal links between modernization and family reproductive behavior are traced. The aspects of modernization which the author considers as determinants of reproductive behavior are: better public health and medical care, growth in formal education, mass media, urbanization, new goods (consumer and fertility control goods), and per capital income growth. These determinants are suggested to affect fertility through one or more of the following: "(a) the demand for children, the number of surviving children parents would want if fertility regulation were costless; (b) the potential output of children, the number of surviving children parents would have if they did not deliberately limit fertility; and (c) the costs of fertility regulation, including both subjective (psychic) costs and objective costs, the time and money required to learn about and use specific techniques.

Faundes-Latham, Anibal, German Rodriguez-Galant, and Onofre Avendano-Portius
1968 "Effect of a Family Planning Program on Fertility of a Marginal Working-Class Community in Santiago." *Demography* 5:122-137.

This paper describes the results during the period March, 1965-March 1966 of a research project designed to ascertain the possible effect of a family planning program on fertility, abortion, infant mortality, and several social and psychological variables in a working-class community in Santiago.

Freedman, Deborah S.

1976 "Mass Media and Modern Consumer Goods: Their Suitability for Policy Interventions to Decrease Fertility." Pp. 356-386 in Ronald G. Ridker (ed.), *Population and Development: The Search for Selective Interventions*. Baltimore: Johns

Hopkins University Press.

The author explores the possibility that programmatic changes in exposure to mass media and consumption of modern goods and services can have an impact on fertility decline in less developed countries. The nature and strength of these assumed relationships are reviewed and consideration is given to policy implications for governments in less developed countries.

Friedlander, Stanley and Morris Silver
1967 "A Quantitative Study of the Determinants of Fertility Behavior." Demography 4: 30-70.

This study empirically examines a wide range of hypotheses relating social, economic, and political variables to fertility based on data from countries classified as developed, intermediate, and underdeveloped. The empirical analysis of these hypotheses reveal positive and significant relations between fertility and illiteracy, child mortality, proportion of agricultural population, proportion of nonfarm self-employment, and overcrowded housing. A negative significant relation is revealed between fertility and communism. Statistically significant relations were not established for population density, social mobility, substitutes for sexual intercourse, achievement motivation, protein in the diet, and religion.

Glassman, Marc B. and John A. Ross
1978 "Two Determinants of Fertility Decline: A Test of Competing Models." Studies in Family Planning 9:193-197.

An examination of the modernization and fertility hypothesis based upon several statistical models and data from eighty-eight countries. Among the statistical models used to evaluate the hypothesis were a simple linear-additive model and a threshold model involving quadratic terms for the variables (infant mortality rate and education) indicative of modernization.

Goldscheider, Calvin
1971 "Population, Modernization and Social Structure." Boston: Little Brown and Company.

This book provides a sociological analysis of demographic processes and a discussion of theoretical, methodological, and empirical issues and problems associated with sociological demography. The central focus of the analysis is areas of convergence in sociological and demographic inquiries. Two major themes emphasized are the role of population processes in the modernization of societies and the relationship between social differentiation and population processes. The author relies

upon historical and comparative evidence on social and population processes to identify the linkages between major aspects of societal transformations indicative of modernization and changes in fertility, mortality, and migration.

Goldstein, Sidney

1972 "The Influence of Labour Force Participation and Education on Fertility in Thailand." *Population Studies* 26:419-438.

An analysis of the impact of female labor force participation and education on fertility with consideration given to women engaged in differentiated occupations and residing in rural and urban localities in Thailand. The study reveals that there is a differential relation between labor force participation and fertility based upon residence category but that regardless of residence category, education is inversely related to the fertility level of women in Thailand.

Heer

Heer, David M.

1970 "Economic Development and Fertility." Pp. 275-293 in Thomas R. Ford and Gordon F. DeJong (eds.), *Social Demography*, Englewood Cliffs, NJ: Prentice Hall, Inc.

The author reviews two contrasting theories on the relationship between economic development and fertility and discusses empirical studies which lend support to each. One theory contends that economic development has an inhibiting effect on fertility while the other suggests that economic development promotes fertility. To reconcile these contrasting views, the author develops and test a theory which suggests that "the direct effect of an increase in the level of economic well-being in a society is an increase in fertility, but various indirects of an increase in economic well-being have such adverse consequences for fertility that, taking into account both direct and indirect effects, an increase in economic level decreases fertility."

Hohm, Charles F.

1976 "An International Analysis of the Effects of Family Allowance Programs on Fertility Levels." *International Journal of Sociology of the Family* 6:45-56.

Using secondary data on sixty seven countries, this study examine the effects of family allowance programs on fertility levels controlling for the effects of other variables indicative of economic development. The control variables were: (1) infant mortality rate per 1,000 population, (2) newspaper circulation per 1,000 adult population, and (3) per capita gross domestic product of the economically active population. Two aspects of family allowance programs were considered in the analysis, coverage and benefit level of the programs. The former refers to how well a program covers the children in a given country

while the latter refers to the relative size of family allowance payments.

- Holsinger, Donald B. and John D. Kasarda
1976 "Education and Human Fertility: Sociological Perspectives."
Pp. 154-181 in Ronald G. Ridker (ed.), Population and
Development: The Search for Selective Interventions.
Baltimore: The Johns Hopkins University Press.

The authors examine the differential ways in which increases in formal education may have an impact on fertility decline. Based upon an extensive literature review, the indirect, direct, and joint effects of education on fertility are discussed. Path analysis is recommended as a tool to determine the relative importance of each type of education effect on fertility.

- Janowitz, Barbara S.
1976 "An Analysis of the Impact of Education on Family Size."
Demography 13:189-197.

The author develops and empirically examines a model which decomposes the impact of education on fertility into its direct effect (holding labor force participation and age at marriage constant) and indirect effect (varying labor force participation and age at marriage).

- Jones, Huw R.
1977 "Fertility Decline in Barbados: Some Spatial Considerations."
Studies in Family Planning 8:157-163.

This study relies upon an areal analysis approach to examine spatial patterns of fertility in Barbados at two time periods, 1960 and 1970. Consideration is given to sex ratios, social class, lack of female education, female employment, and family planning activity to account for spatial patterns of fertility differentials.

- Kiser, Clyde
1968 "Current Research on Fertility and Family Planning in Latin America." Milbank Memorial Fund Quarterly 46:0-289.

A compilation of papers and discussions on current fertility and family planning research in Latin America presented at the 1967 Conference of the Milbank Memorial Fund. Data on fertility in Latin American countries and results of research on abortion and family planning are provided. The authors suggests future research needs with regard to fertility planning in Latin America.

Kocher, James E.

1973 Rural Development, Income Distribution, and Fertility Decline.
New York: The Population Council.

This work examines the process of rural development with special emphasis on the relationship between components of the rural development and fertility behavior and population growth in low-income countries. The author advances a major hypothesis that "the greater the extent to which the rural population is participating in development, the earlier and more rapid will be the decline in overall fertility and population growth rates." Included among the broad topics discussed are the meaning of development, population prospects, the record of rural development in low-income countries, and rural development and fertility decline.

Kocher, James E.

1976 "Rural Development and Demographic Change in Northeastern Tanzania," New Perspectives on Demographic Transition. Occasional Monograph Series No. 4 Washington, DC: Interdisciplinary Communication Program, Smithsonian Institution.

An analysis of the social, cultural, educational, health, and economic changes that have occurred in four rural areas in northeastern Tanzania in relation to fertility change. This analysis was based on interviews of adult members of 1,492 households conducted in a 1973 survey of the four rural areas of northeastern Tanzania. "Data reveal that considerable social, cultural, health, education, and economic changes have occurred in all four rural areas during the past 50 years. Changes were uneven, and where changes were greatest there was a rise in the proportion of women who want no more children despite having smaller-than-average families."

Lele, Uma

1975 The Design of Rural Development. Baltimore: The Johns Hopkins University Press.

In this book, the author discusses rural development perspectives and practices in Africa and draws on evidence from seventeen rural development programs in sub-Saharan Africa to examine the impact of development programs on low-income rural populations. Also, the author identifies some of the more basic issues such as land distribution policies, pricing and marketing, manpower, and credit policies that demand attention in order to reduce the gap between overall rural development objectives and actual performance.

- Mauldin, W. Parker, Bernard Berelson, and Zenas Sykes
1978 "Conditions of Fertility Decline in Developing Countries, 1965-75." *Studies in Family Planning* 9:89-148.

A macro analysis of correlates of fertility decline in developing countries of Asia, Latin America, and Africa during the period 1965-75. Education, health, economic status, status of women, population policy and family planning program activities are the correlates of fertility decline examined in the study.

- McCabe, James L. and Mark R. Rosenzweig
1976 "Female Employment Creation and Family Size." Pp. 322-352 in Ronald G. Ridker (ed.), *Population and Development: The Search for Selective Interventions*. Baltimore: Johns Hopkins University Press.

The authors present an argument for encouraging greater female labor force participation as a means of accelerating smaller family size in less developed countries. A framework and methodology are proposed for investigating the impact that such a policy can have on fertility decline in the less developed countries.

- McGreevey, William P., Nancy Birdsall, James Creager, Anne McCook and Bernice Slutsky
1974 *The Policy Relevance of Recent Social Research on Fertility*. Occasional Monograph Series No. 2, Washington, DC: Interdisciplinary Communications Program, Smithsonian Institution.

A report designed to illuminate the potential relevance of recent social research on the correlates of fertility to decisionmaking for population policy and implementation. The report includes an analysis of the adequacy of this research as well as research on the effectiveness of family planning programs. Also, the report provides a research agenda believed to be amenable to yielding information that can assist decision-makers in the mobilization and allocation of resources for population programs.

- McWilliams, John
1974 "Social Development in Africa: The Case of Family Planning." *Canadian Journal of African Studies* 8:91-107.

The author discusses the possibility of implementing effective family planning programs in Africa without major alterations in the social and economic structure of African society. In addition, the author discusses alternative population programs that may be more appropriate for the developing African nations.

- Miller, Karen A. and Alex Inkeles
1974 "Modernity and Acceptance of Family Limitations in Four Developing Countries." *Journal of Social Issues* 30:167-188.

This article provides a relatively extensive review of the literature on the relationship between societal modernization processes, modernization at the individual level, and the acceptance of family size limitations. The major objective of the article, however, is to test a model which posits that individual modernizing experiences (e.g. education/literacy, mass media exposure, urbanism of residence, occupation and living standard) predict psychological modernity, which in turn predicts acceptance of birth limitation.

- Ravenholt, R. T., John C. Chao and Laura Slobey
1977 "Comparative Impact of Family Planning Programs Upon Fertility in Developing Countries." A paper presented at the Annual Meeting of the Population Association of America (April).

A comparative analysis of the impact of family planning programs upon fertility in developing countries. The authors note the changes in world population policies and contend that developing countries can take effective action to rescue themselves from excessive fertility through implementing effective family planning programs.

- Ridker, Ronald G.
1969 "Desired Family Size and the Efficacy of Current Family Planning Programmes. *Population Studies* 23:279-284.

The author discusses the inconclusive state of evidence from several countries on the adequacy of family planning programs in terms of the provision for supplies, services, and education and the belief that the desire among couples to limit family size is sufficiently large. The author proposes that if the fertility rate is to be reduced, additional methods such as monetary incentives seem to be necessary.

- Ridker, Ronald G.
1976 *Population and Development: The Search for Selective Interventions.* Baltimore: The Johns Hopkins University Press.

A selection of essays on hypothesized socio-economic determinants of fertility assumed to be amenable to policy manipulation in a direction favorable to fertility decline. Income and its distribution, education, value of children, mortality, nutrition, and labor force participation are among the socio-economic variables regarded as determinants of fertility. Many of the essays contain policy implications and policy and program recommendations.

Ridley, Jeanne C.

1959 "Number of Children Expected in Relation to Non-familial Activities of the Wife." *Milbank Memorial Fund Quarterly* 37: 277-296.

This study considers the non-familial activities-fertility hypothesis which suggests a negative relationship between non-familial activities of the wife and fertility because of the incompatibility of non-familial and housewife and mother roles. The analysis of this hypothesis reveals that labor force participation has a depressing effect on fertility and is a major factor in the wife's decision to limit family size.

Shevasunt, Somphong, Dennis P. Hogan, and Kwanchai Thaithong
1978 "Fertility and Family Planning in Rural Northern Thailand." *Studies in Family Planning* 9:212-221.

A review of family planning activities in Thailand along with an assessment of whether widespread adoption of family planning and/or fertility declines have occurred among a rural population that has not undergone substantial social and economic development.

Standing, Guy

1978 *Labour Force Participation and Development*. Geneva Switzerland: International Labour Office.

This monograph focuses on the economic determinants of labor force participation in low-income industrializing economies. A great deal of emphasis is placed on examining factors influencing the changing economic role of women such as health and nutrition, unemployment, education, and fertility.

Stycos, J. Mayone

1968 *Human Fertility in Latin America*. New York: Cornell University Press

This book provides a sociological perspective on fertility in Latin America. The author's point of departure is a general discussion on the world population problem, Latin America population problem, and the attitudes of Latin American intellectuals toward the population problem. The author proceeds to assess the influence of Latin America social norms and structure on fertility. In this regard, the attitudes toward family size and birth control practices are discussed along with the impact of family stability, female employment, education, and urbanization on fertility. Finally, the author discusses prospects for enhancing fertility control in Latin America.

Tsui, Amy Ong and Donald J. Bogue
1978 "Declining World Fertility: Trends, Causes, Implications."
Population Bulletin 33:3-42.

The focal points of this paper are: (1) an examination of the evidence that the world's fertility has declined in recent years, (2) an analysis of the factors which appear to be associated with the apparent world's fertility decline and (3) implications for fertility and population growth rates to the end of the century. Based on compilation of estimates available for all nations of the world, the authors derive estimates which indicate that the total fertility rate declined from 4.6 to 4.1 births per woman between 1968 and 1975, due largely to the unanticipated rapid and universal decline in the fertility of less developed countries. The relationship of several socio-economic development indicators and the 1972 family planning effort with fertility was empirically examined. The socio-economic development indicators included per capita gross national product, percent of the population living in urban areas, infant mortality rates, life expectancy at birth, percent of employed women working in agriculture, percent literate of the population, and male and female school enrollment ratios. The authors indicate that the socio-economic progress made by the LDCs during the period was not significant enough to account for more than a small proportion of the fertility decline and that organized family planning programs were a major contributing factor. The authors predict that by the year 2000 less than a fifth of the world's population will be in the "red danger" circle of explosive population growth (2.1 percent or more annually). However, they warn that this prediction is premised upon a continued organized family planning effort.

Tsui, Amy Ong, Jay D. Teachman and Donald J. Bogue
1978 "Predicting Fertility Trends in LDCs Over the Next Century."
A paper presented at the Meeting of the Population Association of America, Atlanta, Georgia.

As a means of predicting fertility trends in LDCs over the next century, the authors of this study: (1) present an assessment of the world and regional fertility situation in 1968 and 1975 and the amount and tempo of change over that period; (2) analyze the assumed causal factors of the fertility change (both socio-economic and demographic factors, including family planning effort; and (3) provide a translation of the rate of decline in total fertility over the century to 2075 for three developing regions--Asia, Africa, and Latin America and 15 heavily populated countries. The authors suggest that their analysis confirms and strengthens what others have noted with regard to the efficacy of family planning as a means of regulating population growth and facilitating overall social improvement. To maintain and even accelerate the rate of fertility decline,

the authors believe that it will be necessary to intensify resource inputs into organized family planning programs in LDCs.

Yang, Jae Mo, Sook Bang, Myung Ho Kim, and Man Gap Lee
1965 "Fertility and Family Planning in Rural Korea." *Population Studies* 18:237-250.

This article reports on the preliminary results of a research project designed to demonstrate and assess the impact of family planning-educational and clinical services on fertility rates in two rural Korean townships. Data are presented and analyzed from two surveys of a random sample of residents in each of the townships. The first survey covered attitudes and practices related to family planning. The second survey, conducted after over a year of intensive family planning programming in the townships, focused on changes that had occurred in fertility rates and in the practice of contraception control. Both townships were of similar size and characteristics, however, the family planning program in one of the townships was considered to be more intensive than in the other.

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1971 "Non-familial Activity and Socio-economic Differentials in Fertility." *Demography* 8:353-368.
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1975 "Health Programs and Population Growth." *Population and Development Review* 1:189-199

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Stoeckel, John and Moqbul A. Choudhury

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Stolka, Susan M. and Larry D. Bennett

1969 "Education and Religion as Factors in Womens' Attitudes Motivating Childbearing." *Journal of Marriage and the Family* 31:740-750.

Sutton, Gordon F. and Gooloo S. Wunderlich

1967 "Estimating Marital Fertility Rates by Educational Attainment Using a Survey of New Mothers." *Demography* 4:135-142.

Tien, H. Yuan

1967 "Mobility, Non-familial Activity, and Fertility." *Demography* 4:218-227.

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EXECUTIVE SUMMARY

of

THE RURAL DEVELOPMENT, EDUCATION AND FERTILITY: A STATE-OF-THE-ARTS PAPER

by

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EXECUTIVE SUMMARY

The primary aim of the Rural Development, Education and Fertility paper is to provide a comprehensive review of the present state of knowledge concerning selected rural development interventions and their impact on education and hence fertility in the developing regions of Africa, Asia, Latin America and the Middle East. The rural development interventions considered were participation of the rural poor, extension of social services, rural marketing systems, area development, rural finance systems and off-farm employment.

The paper includes a conceptual explanation of the rural development interventions, both a general and region-specific hypothesis inventory on the relationships between the rural development interventions, education and fertility, and an annotated bibliography.

The authors utilized a theoretical model of human fertility developed by Richard Easterlin to integrate the hypotheses identified into a logical framework for analysis and review.

The Easterlin model basically focuses upon three sets of variables which affect fertility: demand for children, supply of children, and motivation for fertility regulation. Demand for children refers to the number of surviving children that parents would have if it involved no cost for fertility regulation. Demand for children is seen as depending on (1) income, (2) prices, and (3) tastes and preferences. Supply of children has to do with the number of surviving children that parents would have if they did not deliberately limit fertility. The supply of children depends on human fecundity, which is influenced by cultural and health factors as well as the survival

prospects of children. According to Easterlin, it is the relationship between demand for and supply of children which determines the motivation and cost for fertility regulation.

The paper reports on a considerable body of literature linking formal education and fertility, while noting the absence of existing literature on the relationship between non-formal education and fertility. Furthermore, almost no studies were identified which specifically focused upon the consequences of the rural development interventions for education and hence fertility.

A number of tentative and speculative hypotheses concerning the linkage between rural development activities, education and fertility were advanced by the authors, but only the education-fertility hypotheses are presented with supporting theoretical and empirical evidence.

The analysis of the education-fertility linkage suggested the following:

(a) With respect to supply factors:

- (1) Education will vary inversely with probability of a woman's ever marrying.
- (2) The greater the level of education, the greater the delay of marriage of women. This will shorten the fertile period of a woman's life.
- (3) The greater the level of education, the better the health of couples. This will result in increased fertility.
- (4) The greater the level of education, the more likely will it be that cultural predispositions toward longer lactation periods and postpartum abstinence will be altered and shortened.
- (5) The greater the level of education of parents, the lower the level of infant or child mortality.

(b) With respect to the demand for children:

- (1) The greater the level of education the smaller the ideal family size and the smaller the desired family size.
- (2) The greater the level of education the lower the desire

for a large number of sons.

- (3) The greater the level of education the lower the perceived benefits of children and the higher the perceived costs of children.
 - (4) The higher the level of education the greater the perceived ability to afford children.
- (c) With respect to fertility regulation factors:
- (1) The greater the level of education the greater the knowledge of birth control.
 - (2) The greater the level of education the more positive the attitude of couples toward birth control.
 - (3) The higher the level of education the more likely the use of contraceptive devices.
 - (4) The higher the level of education the more likely will there be husband-wife communication concerning family planning practice.

These hypotheses were generally supported by empirical studies in each of the developing regions, however, for some of the hypotheses much more significance was accorded them in urban areas than rural areas.

Although no substantive conclusions were drawn from the empirical literature with regard to the impact of the rural development interventions on fertility via education, there appears to be a theoretical basis for the view that over the long run rural development interventions promote higher levels of education among rural populations which, in turn, depresses fertility rates. This, of course, depends upon the transformation of group norms, familial institutions and personal attitudes.

Finally, the paper recommends the following for future research considerations:

- (a) an examination of specific rural development projects and their fertility-related consequences. The rural development conceptual categories currently employed by USAID are too vague and unwieldy to be of any value in measuring the population impact of USAID rural development interventions.

- (b) an examination of the effects of non-formal education on fertility behavior. This is warranted if intelligent and informed conclusions are to be made regarding the impact of rural development projects on fertility.
- (c) an examination of the fertility-related consequences of rural development interventions by means of retrospective and prospective case studies which employ extended time frames. Both types of studies are required in order to assess the nature and extent of measurable changes in the rural development - education - fertility relationships.

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53: 314-339.

This paper presents an economic analysis of fertility and mortality matters as they are affected by economic and social forces. The results of this study suggest that there is a systematic dependence of age specific birth and death rates upon some of the important socioeconomic variables. The author concludes that the influence of socioeconomic variables upon the demographic features of a society is very much smaller than the effect of population upon economic development.

Aghajanian, Akbar

- 1978 "Fertility and Family Economy in the Iranian Rural Communities."
Journal of Comparative Family Studies 9:119-127.

The author develops and empirically examines four propositions concerning the relationship between economic activity of rural families and fertility. The economic activity variables posited as having an influence on fertility are: (1) the degree of family involvement in agricultural production, (2) size of family landholding, and (3) economic activity of women within the family. Education and age at marriage are considered as intervening factors between economic activities and fertility levels of families.

Arowolo, Oladele O.

- 1976 "Determinants of Fertility Among Yorubas of Nigeria," Recent Empirical Findings on Fertility: Korea, Nigeria, Tunisia, Venezuela, Philippines. Occasional Monograph Series No. 7, Interdisciplinary Communications Program, Smithsonian Institution.

An analysis of the impact of socioeconomic and life history variables on fertility based on a survey of 654 Yoruba households in rural and urban areas of southwestern Nigeria. The independent variables included: education, occupation, religious affiliation, and infant and child mortality. Only education was found to have a significant and depressing effect on fertility.

Banks, Joseph A.

- 1954 Prosperity and Parenthood, London: Routledge and Kegan Paul.

This work is a study of family planning among the Victorian middle class and reveals that the rising standard of living is a significant factor in the decline of fertility.

Becker, G.S.

- 1960 "An Economic Analysis of Fertility," pp. 209-240 in National Bureau of Economic Research, Demographic and Economic Change in Developing Countries. Princeton, New Jersey: Princeton University Press.

This pioneering work develops a new home economic theory of fertility which is characterized by an emphasis on family income and the cost of children as the primary determinants of the demand for children.

1965 "A Theory of the Allocation of Time." *Economic Journal* 75: 493-517.

The landmark article develops a basic theoretical analysis of choice that includes the cost of time on the same footing as the cost of market goods and at the same time treats the various empirical implications of the theory.

Becker, G. S. and H. G. Lewis

1973 "On the Interaction Between the Quantity and Quality of Children." *Journal of Political Economy* 81: 279-288.

The paper critically examines the relation between the quantity of children ever born to a family and the quality of their children as perceived by others if not by the parents. It is found that there exists a negative correlation between quantity and quality of children per family in both cross-section and time-series studies.

Ben-Porath, Yoram

1972 *Fertility in Israel, An Economic Interpretation: Differentials and Trends, 1950-1970.* Santa Monica: The Rand Corporation.

This paper explores the evidence in support of the basic hypothesis that the number of children families have depends on how many they want. The author detects the absence of a negative education effect on fertility in Kibbutzin, and the existence of a positive income effect for the Arab population.

1973 "Economic Analysis of Fertility in Israel and Counter Point." *Journal Political Economy* 81: 202-233.

In this paper, the author examines cross-sectional data on fertility with regard to the hypotheses on the links among education, the cost of time of women, and the full price of children.

Birdsall, Nancy

1977 "Analytical Approaches to the Relationship of Population Growth and Development." *Population and Development Review* 3:63-102.

The author reviews the major analytical approaches to the study of the relationship between population growth and economic development. Research on the macro and micro determinants and consequences of fertility is discussed along with the policy implications associated with each of these lines of research.

Bogue, Donald J.

1969 *Principal of Demography*. New York; John Wiley and Sons.

This work is a comprehensive treatise covering the entire field of population study. It presents demography as a systematic discipline and assembles and formulates generalizations and principles. Further, it integrates demography with other social sciences.

Boserup, Ester

1970 *Women Role in Economic Development*. London: George Allen and Irwin, Ltd.,

This work is a comprehensive study of role of women in different regions of the world. Relevant data for women's role in Africa, Asia, Latin America, and Middle East are compiled and examined.

Brackett, James W., R. T. Ravenhold and John C. Chao

1978 "The Role of Family Planning in Recent Rapid Declines in Fertility in Developing Countries: Some Findings from the World Fertility Survey." A paper presented at the Meeting of the Population Association of America, Atlanta, Georgia.

In this paper, data from the World Fertility Survey are examined to measure the impact of family planning and socio-economic development factors on fertility control in ten developing countries--Columbia, the Dominican Republic, Fiji, South Korea, Malaysia, Nepal, Pakistan, Panama, Sri Lanka and Thailand. The analysis of the data revealed that, despite broad differences in geography, culture, religion, race and socio-economic development, a large proportion of women in every country do not desire any more children.

This desire was found to be strong among rural, poor, and not very well educated women in all countries. The authors conclude that socio-economic development is not a dominant factor in terms of the desire for fertility control by the populations, except among the poorest where the sheer survival of the existing family dictates the need to control further fertility. The role of family planning in at least eight of the ten countries is considered to be a prime factor accounting for fertility control and ultimately the declining rate of fertility in these countries.

Bumpass, Larry L.

1969 "Age at Marriage as a Variable in Socio-Economic Differentials in Fertility." *Demography* 6: 45-54.

This study reports a strong negative relation between fertility and socio-economic status for non-Catholic American couples in contrast to a positive relation for Catholics.

Butterfield, Samuel H.

1977 "Rural Development: Why It Is Hard for Developing Countries Leadership to Get Started." *International Development Review* 19: 8-24.

This paper defines the meaning of rural development and discusses five fundamental characteristics of effective rural development and problems that a nation will face.

Butz, William P. and Jean-Pierre Habicht

1976 "The Effects of Nutrition and Health on Fertility: Hypotheses, Evidence, and Interventions." Pp. 210-238 in Ronald G. Redker (ed.), *Population and Development: The Search for Selective Interventions*. Baltimore: John Hopkins University Press.

A review of the evidence regarding biological and behavioral effects of nutrition and health factors on fertility. The authors present a model to predict variations in fertility that result from changes in nutrition and health. The implications of available evidence for choosing among modes of delivering health, nutrition, and family planning services are discussed along with research questions whose illumination would assist governments in making choices among alternative policy interventions.

Caldwell, John C.

1968 "The Demographic Implications of the Extension of Education in a Developing Country: Ghana." *Population Association of America Annual Meeting, Collected Papers* 6:18-29.

The author analyzes the impact that the rapid extension of education in Ghana during the period 1948-1960 has had on demographic behavior. Among the demographic behavioral variables considered in relation to the extension of education are rural-urban migration, parental generation fertility, desired family size, delayed marriage, conscious reduction of marital fertility, family planning and mortality. It is suggested that the existing associations between education and demographic behavior are so strong that the continuing extension of education in the country will undoubtedly have the profoundest effects on population phenomena. However, the author notes that the major impact of education in reducing fertility operates through factors such as changing marriage forms, alterations in the relations between spouses, intensifying the concern of parents for things within the family and making new forces of knowledge accessible.

Caldwell, John C.

1968 "The Control of Family Size in Tropical Africa," Demography 5:589-619.

This study analyzes family planning knowledge, attitudes, and practices based upon available survey data from West and East African countries. The data are representative of rural and urban residents of both regions of Africa. The author concludes that the existence and length of formal education has been a major determinant of fertility behavior patterns. Education is seen as having influenced attitudes toward family size, knowledge of contraception, and use of contraceptives.

Carleton, Robert O.

1965 "Labor Force Participation: A Stimulus to Fertility in Puerto Rica?" Demography 2: 1, 233-239.

This study contains cross-tabulations of census data provided by United States Bureau of the Census for the Puerto Rican Planning Board. Includes statistical tables on the rates of fertility among married Puerto Rican Women, considering age, years of school completed and economic activity and fertility rates of married Puerto Rican women in order to account for the apparent fertility decline in the area.

Carr-Saunders, A.M.

1922 The Population Problem: A Study in Human Evolution. Oxford; University of Oxford Press.

The work investigates the relationship between culture and fertility in the process of human evolution.

Carvajal, Januel J. and David T. Geithman

1976 "Socio-economic Fertility Determinants in Costa Rica 1963-1973," New Perspectives on the Demographic Transition. Occasional Monography Series No. 4, Interdisciplinary Communications Program, Smithsonian Institution.

"An economic model of fertility is used to help explain the decline in fertility in Costa Rica between 1963 and 1973. Data are provided by both Costa Rican censuses and a mid-1960's CELADE fertility survey." The data were organized into socio-economic reference groups (SORGs) of families. The influence of family income, female participation in the labor force, presence of the extended family, urban-rural location of the household, participation in the social security, sanitation facilities in the household, and home ownership on fertility was examined. "A major finding of the study is that while income and fertility are negatively related between social classes, the relationship is positive within a given social class."

Cassen, Robert H.

- 1978 "Current Trends in Population Change and Their Causes." *Population and Development Review* 4:331-353.

A survey of current trends in population change in the major regions of the developing world. Supporting evidence is provided for some of the socio-economic development factors, including family planning effort, that are considered as determinants of fertility differentials within and between the developing regions and countries.

Chai, Lee Hyo and Cho Hyoung

- 1976 "Fertility and Women's Labor Force Participation," *Recent Empirical Findings on Fertility: Korea, Nigeria, Runisia, Venezuela, Philippines*. Occasional Monograph Series No. 7, International Communications Program, Smithsonian Institution.

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

Chandrasekhar, Sripati

- 1972 *Infant Mortality, Population Growth and Family Planning in India*, Chapel Hill: University of North Carolina Press.

This work is devoted to an examination of the important aspects of infant mortality in India and deals with the known facts on the magnitude of the infant mortality rate and its causes.

Chaudury, R. H.

- 1978 "Female Status and Fertility Behavior in a Metropolitan Urban Area of Bangladesh." *Population Studies* 32: 261-274.

This paper tests and confirms the hypotheses that certain aspects of married women such as (1) decision-making power; (2) employment status and (3) educational status are positively associated with use of contraceptives and inversely related to fertility performance with the exception that female employment has little or no effect on contraceptive use among women in the higher education and income group.

Chow, L. P.

- 1965 "A Program to Control Fertility in Taiwan." Population Studies 57: 155-166.

This paper describes and examines the accomplishment and procedures of a family-planning health program in Taiwan, involving mainly the use of a new intra-uterine contraceptive device (IUD).

- 1968 "A Study of the Demographic Impact of the IUD Program," Population Studies 22: 347-359.

This paper discusses and presents data obtained through various studies and surveys on the effect of the IUD contraceptive program in Taiwan.

Cochrane, Susan H.

- 1978 "Fertility and Education: What Do We Really Know?" Population and Human Resources Division, Development and Economic Department, World Bank.

This study is the most complete and up-to-date (as of 1977) examination of extant literature concerning formal education and human fertility. The author first examines cross-national studies, cross-regional studies, and individual data. She follows with cross-tabular studies and multiple regression analyses to examine the empirical relationship between education and fertility at the aggregate level she then turns to the development, of the model suggested by Richard Easterlin as a logical and effective way of ordering the data linking education and fertility. Using Easterlin's supply factors, Cochrane examines the relationship between education and marriage, fecundity and infant and child mortality. From the supply size, Cochrane examines factors determining the demand for children preferences for children, cost and benefits for children, and desired family size. Turning to the relationship of education and fertility regulations, she examines the data linking education with attitude toward birth control, knowledge of contraception, husband wife communication, and contraceptive use. In summarizing the evidence, Cochrane shows that from the supply perspective probability of marrying, lactation, postpartum abstinence, and infant or child mortality will be inversely related to the level of education while health, lactation, and postpartum abstinence will be directly related to level of education. Thus, improved health of the mother along with reduction of existing taboos resulting from education will result in an increase in the supply of children. The literature dealing with demand factors demonstrates an inverse relationship regarding education level and the preference for children/ideal family size, the desired number of sons, and the perceived benefits of children. The literature demonstrates a direct relationship between education and the perceived cost of children and perceived ability to afford children. The probable relationship of education operating through these demand variables is seen as inverse in all

areas except that concerning the perceive ability to afford children. The fertility regulation factors all show direct relationships between education and the fertility regulation variables. The implications regarding the relationship of education through the variables indicate an inverse relationship between level of education and fertility.

- Cohen, John M., Gladys A. Culagovski, Norman T. Uphoff and Daniel L. Wolf
1978 Participation at the Local Level: A Working Bibliography. Ithaca, New York: Rural Development Committee, Center for International Studies, Cornell University.

An extensive bibliography on participation at the local level. Studies are grouped under the following major headings: Participation and Development, Local Organization, Local Leadership and Elites, Political Participation, Political Factors Affecting Participation, Social Factors Affecting Participation, Institutional Contexts of Participation, Participation and Spanish Sources on Participation. Studies under the latter two headings are annotated.

- Collver, A., A. Speare Jr., and P. K. Liu
1967 "Local Variation on Fertility in Taiwan," Population Studies 20: 329-342.

This study reveals a strong negative correlation between total fertility and a series of indicators of social development and communication. Most of the variations in fertility are accounted for by differences in the fertility of married women aged over 30 and in the age at marriage. The adoption of family limitations originated in urban cities and spread rapidly to small towns and rural areas.

- Cutright, Phillips, Micheal Hout, and David R. Johnson
1976 "Structural Determinants of Fertility in Latin America." American Sociological Review 41:511-527.

"Theoretical arguments that structural modernization reduces fertility rates are reviewed and empirical work discussed. The view that Latin American fertility has not responded to increasing modernization because the Roman Catholic Church is a powerful pronatalist institution is tested with a historical model. Characteristics of Spanish rule before 1830 and 19th century immigration patterns are determinants of the level of modernization and Catholic institutional strength in 1900. Modernization reduces crude birth rates on 1910 and later years and also depresses illegitimate and marital fertility. A strong negative effect of Catholic strength on illegitimacy is counter-balanced by its strong positive impact on marital fertility."

Dandekar, Kumudini

- 1965 "Effects of Education on Fertility." Proceedings of the World Population Conference. Belgrade 4: 127-130.

This short paper summarizes the empirical results of several studies on the impact of education on fertility.

DaVanzo, Julie

- 1972 The determinants of Family Formation in Chile, 1960: An Economic Study of Female Labor Force Participation, Marriage, and Fertility Decisions. Santa Monica: The Rand Corporation.

This article presents a model that details the interrelationships among female labor force participation, marital status and fertility decision in Chile and how these are affected by economic factors and other aspects of the environment under which these decisions are made.

Davis, Kinsley

- 1963 "The Theory of Change and Response in Modern Demography History." Population Index 29: 345-369.

This work develops theories and enlists empirical evidence of change and response to explain sociological aspects of human fertility behavior in modern history.

David, Kinsley and Judith Blake

- 1956 "Social Structure and Fertility: An Analytical Framework." Economic Development and Cultural Change 4: 211-235.

This landmark work classifies the "intermediate variables" that immediately effect fertility and discusses their level and relation to selected social factors in pre-industrial society.

Detray, Dennis N.

- 1973 "Child Quality and the Demand for Children: Journal of Political Economy 81 (2): 70-95.

The paper considers the degree to which pure economic theory can, or cannot, predict changes in completed fertility. The major emphasis of this study is the way which households can increase their production of child services either by increasing numbers of children or by increasing the resource investment in existing children. Quantity and quality are considered to be substituted in the households production function for child services.

Dixon, Ruth B.

- 1976 "The Roles of Rural Women: Female Seclusion, Economic Production, and Reproductive Choice," Pp. 290-322 in R. A. Ridker (ed.), Population and Development, the Search for Selective Interventions, Baltimore: The John Hopkins University Press.

The central argument of this paper is that the practice of female seclusion, by depriving girls and women of direct access to material and social resources in the community at large, creates in them a condition of extreme economic and social dependence that not only compels their early marriage but also militates against the effective practice of birth control within the marital union. As social and economic opportunities for girls and women in the community begin to undermine old bases of authority within the family and as traditional patterns of early marriage and frequent childbearing becomes less and less to justify, a more desirable form of demographic behavior may emerge.

Drakotos, Constantine G.

- 1969 "The Determinants of Birth Rate in Developing Countries: An Econometric Study of Greece." *Economic Development and Cultural Change* 17: 596-603.

The paper investigates whether economic development has any dampening effect on population growth with special reference to the deterrent of the birth rate in a developing country like Greece. The study reveals that per capita income is not so useful in explaining the variance in the birth rate. The literacy rate is found to exert the strongest influence on the birth rate, followed by the rate of reproductive women to total population.

Easterlin, R. A.

- 1969 "Towards a Socio-Economic Theory of Fertility: A Survey of Recent Research on Economic Factors in American Fertility." pp. 127-156 in S. J. Behrman, L. Corsa, Jr., and R. Freedman (eds), *Fertility and Family Planning: A World View*. Ann Arbor: University of Michigan.

- 1973 "The Economics and Sociology of Fertility: A Synthesis." University of Pennsylvania, Department of Economics.

A solid theoretical framework is developed beyond the author's 1969 work to enable economists and sociologists each to see the relevance of the other discipline's work. This framework includes three equations: equation of the demand for children, equation of the supply of children and equation of the motivation for controlling baby-making.

Easterlin, Richard A.

- 1974 "The Effect of Modernization on Family Reproductive Behavior." pp. 263-288 in the United Nations (ed.), *The Population Debate: Dimensions and Perspectives*, Papers of the World Population Conference, Bucharest.

This paper provides a theoretical examination of the nature and causes of the change in family reproductive behavior associated with modernization. The paper consists of four sections. The first section discusses the meaning of modernization and describes the changes in family behavior associated with it. The second presents a theoretical framework for analyzing the determinants of fertility behavior. In the third and fourth sections, the causal links between modernization and fertility

behavior are traced. The aspects of modernization which the author considers as determinants of reproductive behavior are: better health and medical care, growth in formal education, and mass media, urbanization, new goods (consumer and fertility control goods), and per capital income growth. These determinants are suggested to affect fertility through one or more of the following: "(a) the demand for children, the number of surviving children parents would want if fertility regulation were costless; (b) the potential output of children, the number of surviving children parents would have if they did not deliberately limit fertility; and (c) the costs of fertility regulation, including both subjective (psychic) costs and objective costs, the time and money required to learn about and use specific techniques.

Ekane, Ita I.

1972 "The Further Note on the Relation Between Economic Development and Fertility." *Demography* 9: 383-388.

In the paper, the author reruns the Heer's 1966 model for LDCs and finds the pattern of relationship in each group of country changes significantly. The study seems to support two of the hypotheses in the Heer's study. For LDCs, it remains true that increased economic development implies a decreased illiteracy and infant mortality rate and in turn lower fertility rate. Nevertheless, the data do not seem to resolve the question of whether increased economic development implies a decreased fertility rate.

Farcooq, G. H. and Baran Turcer

1974 "Fertility and Economic and Social Development in Turkey: A Cross-sectional and Time-series Study." *Population Studies* 28: 263-276.

The work explores the impact of modernization which started in the early 1920s on the fertility levels in Turkey. The major finding of the study is that continuing modernization and the concomitant speed of female education would result in a continuing decline in the fertility rate.

Faundes-Latham, Anibal, German Rodriguez-Galant, and Onofre Avendano-Portius

1968 "Effect of a Family Planning Program on Fertility of a Marginal Working-Class Community in Santiago." *Demography* 5:122-137.

This paper describes the results of a research project designed to ascertain the possible effect of a family planning program on fertility, abortion, infant mortality, and several social and psychological variables in a working-class community in Santiago.

Freedman, Deborah S.

1972 "The Relationship of Family Planning to Savings and Consumption in Taiwan." *Demography* 9: 499-505.

This study relates fertility behavior to modern economic behaviors, namely, savings and consumption of modern durables in Taiwan. It is found that successful family planners are more likely to save and to have more modern durables.

Freedman, Deborah S.

- 1976 "Mass Media and Modern Consumer Goods: Their Suitability for Policy Interventions to Decrease Fertility." Pp. 356-386 in Ronald G. Ridker (ed.), Population and Development: The Search for Selective Interventions. Baltimore: John Hopkins University Press.

The author explores the possibility that programmatic changes in exposure to mass media and consumption of modern goods and services can have an impact on fertility decline in less developed countries. The nature and strength of these assumed relationships are reviewed and consideration is given to policy implications for governments in less developed countries.

Friedlander, Stanley and Morris Silver

- 1967 "A Quantitative Study of the Determinants of Fertility Behavior." Demography 4: 3-70.

This study empirically examines a wide range of hypotheses relating social, economic, and political variables to fertility based on data from countries classified as developed, intermediate and underdeveloped. The empirical analysis of these hypotheses reveal positive and significant relations between fertility and illiteracy, child mortality, proportion of agricultural population, proportion of non-farm self-employment, and overcrowded housing. A negative significant relation is revealed between fertility and communism. Statistically significant relations were not established for population density, social mobility, substitutes for sexual intercourse, achievement motivation, protein in the diet, and religion.

Frejka, Thomas

- 1969 "Demographic Aspects of Women's Employment." pp. 1959-1582 in International Population Conference. Liege: International Union for the Scientific Study of Population.

This work examines the relationship between female employment and fertility. The results indicate that the most important factor determining whether or not a woman is working is the number and age of her dependent children. On the other hand, the length and type of employment influences the amount of children women desire.

Glassman, Marc B. and John A. Ross

- 1978 "Two Determinants of Fertility Decline: A Test of Competing Models." Studies in Family Planning 9:193-197.

An examination of the modernization and fertility hypothesis based upon several statistical models and data from eighty-eight countries. Among the statistical models used to evaluate the hypothesis were a simple linear-additive model and a threshold model involving quadratic terms for the variables (infant mortality rate and education) indicative of modernization.

Goldscheider, Calvin

1971 "Population, Modernization and Social Structure," Boston: Little Brown and Company.

This book provides a sociological analysis of demographic processes and a discussion of theoretical, methodological, and empirical issues and problems associated with sociological demography. The central focus of the analysis is areas of convergence in sociological and demographic inquiries. Two major themes emphasized are the role of population processes in the modernization of societies and the relationship between social differentiation and population processes. The author relies upon historical and comparative evidence on social and population processes to identify the linkages between major aspects of societal transformations indicative of modernization and changes in fertility, mortality, and migration.

Goldstein, Sidney

1972 "The Influence of Labor Force Participation and Education on Fertility in Thailand." Population Studies 26: 419-436.

This paper undertakes a comparative analysis of the relation among female labor force participation for the urban and rural segments of the Thai population. The major finding of this study is that the greater separation of work and family roles, which characterizes employment for women in the urban center, lower fertility. In the general absence of such a conflict in rural society, female labor force participation has minimal effect on fertility. And, regardless, of residence category, education is inversely related to fertility level.

Gregory, Paul R., and J. M. Campbell, Jr.

1976 "Fertility Interactions and Modernization Turning Points." Journal of Political Economy 84: 835-847.

This paper provides an estimate interaction model of fertility and economic development which directly incorporates into the fertility decisions such factors as taste changes and variations in the fertility control associated with modernization. The results show that fertility income and substitution effects do vary considerably during the course of modernization.

Gregory, Paul R., J. M. Campbell and Benjamin S. Cheng

1972 "A Cost-Inclusive Simultaneous Equation Model of Birth Rates." Econometrica 40: 681-687.

In this paper, the authors develop a simultaneous equation model of birth rates composed of four estimated equations. This work differs from past research in that it considers the simultaneous relationship between birth rates and income and includes the cost of fertility as an explanatory factor. This cost is measured by the female labor force participation rate under the assumption that income foregone due to fertility is a significant opportunity cost.

- 1973 "Differences in Fertility Determinants: Developed and Developing Countries." *Journal of Development Studies* 9: 233-241.

The study estimates two separate fertility models for developed and developing countries to determine if they are the same. The author concludes that insofar as education is a significant determinant of natural birth rate in developing countries, investment should be allocated to social infrastructural uses which raise the level of education and thereby reduce fertility rather than to physical capital consumption. The empirical results indicate that birth rates can be reduced in developed countries by a combination of infrastructural investment in human beings and by encouraging greater female participation in the labor force.

- Harbison, F., and C. A. Myers
1964 *Education, Manpower and Economic Growth, Strategies of Human Resource Development*. New York: McGraw-Hill Book Co.

This volume analyzes economic, political, and social development in the context of education, training, and energizing of human resource. It presents a generalized concept of human resources development which is important to economic planners and educational manpower planners.

- Harman, Alvin J.
1970 "Fertility, Manpower and Economic Behavior of Families in Philippines." Santa Monica: The Rand Corporation.

This is an empirical analysis of the interrelationships between fertility and socioeconomic behavior of families. The analysis is designed to give insights into the relative merits of various policies affecting population growth. Results show that education and income for all age groups and increased female education correlate with smaller family size, higher age at first marriage, and employment.

- Hassan, S.
1966 "The Influence of Child Mortality on Fertility." Paper Presented at Annual Meeting of the Population Association of America, New York City.

This is a refined analysis of the influence of child mortality on fertility in the Middle East.

- Heer, D. M., and E. S. Turner
1965 "Area Differences in Latin American Fertility." *Population Studies* 18:279-292.

This study correlates areal differences in the child women ratio in the 318 local political units of 18 Latin American countries. The results disclose that the level of economic development is positively related to fertility in the short run which is counteracted in the long run by fertility-depressing forces associated with a high level of economic development.

Heer, David M.

1970 "Economic Development and Fertility." pp. 275-293 in Thomas R. Ford and Gordon F. DeJong (eds.), *Social Demography*, Englewood Cliffs, N.J.: Prentice Hall, Inc.

The author reviews two contrasting theories on the relationship between economic development and fertility and discusses empirical studies which lend support to each. One theory contends that economic development has an inhibiting effect on fertility while the other suggests that economic development promotes fertility. To reconcile these contrasting views, the author develops and test a theory which suggests that "the direct effect of an increase in the level of economic well-being in a society is an increase in fertility, but various indirects of an increase in economic well-being have such adverse consequences for fertility that, taking into account both direct and indirect effects, an increase in economic both direct and indirect effects, and increase in economic level decreases fertility."

Henin, R.

1968 "Fertility Differentials in the Sudan." *Population Studies* 22: 147-164.

This paper reports on a demographic survey of 4750 women, aged 15 and over, that was carried out in 1961-62 in different parts of the Sudan to study fertility differentials between the nomadic and settled population. It is found that the settled populations tends to have higher fertility than that of nomadic.

1969 "The Patterns and Causes of Fertility Differentials in the Sudan." *Population Studies* 23: 171-198.

This is an extension of the author's 1968 study. The paper examines the nature of the fertility differentials in the Sudan and assesses possible causes such as different marriage patterns and medical and psychological factors.

Hohm, Charles F.

1976 "An International Analysis of the Effects of Family Allowance Programs on Fertility Levels." *International Journal of Sociology of the Family* 6:45-56.

Using secondary data on sixty seven countries, this study examine the effects of family allowance programs on fertility levels controlling for the effects of other variables indicative of economic development. The control variables were: (1) infant mortality rate per 1,000 population, (2) newspaper circulation per 1,000 adult population, and (3) per capita gross domestic product of the economically active population. Two aspects of family allowance programs were considered in the analysis, coverage and benefit level of the programs. The former refers to how well a program covers the children in a given country while the latter refers to the relative size of family allowance payments.

- Holsinger, Donald B. and John D. Kasarda
1976 "Education and Human Fertility: Sociological Perspectives."
Pp. 154-181 in Ronald G. Ridker (ed.), Population and Development: The Search for Selective Interventions, Baltimore: The John Hopkins University Press.

The authors examine the differential ways in which increases in formal education may have an impact on fertility decline. Based upon extensive literature reviews, the indirect, direct, and joint effects of education on fertility are discussed. Path analysis is recommended as a tool to determine the relative importance of each type of education effect on fertility.

- Huffman, S. L. A. K. M. Alauddin, C. J. Charkraaborty and W. H. Mosley
1978 "Nutrition and Post Partum Amenorrhoea in Rural Bangladesh."
Population Studies 32: 262-273.

A cross-sectional survey of 2048 breastfeeding women in rural Bangladesh was conducted in 1975 to explore factors affecting the duration of post-partum amenorrhoea. The study suggests that the pattern of breastfeeding plays the primary role in determining lengths of lactational amenorrhoea for the rural population.

- International Bank for Reconstruction and Development
1975 Rural Development: Sector Policy Paper. Washington, D. C.

This work examines policy issues related to rural development.

- 1978 World Development.

This is a series of annual reports compiled by the World Bank to provide a comprehensive assessment of the global development issues along with a statistical annex.

- Jaffe, A., and Ke. Azumi
1960 "The Birth Rate and Cottage Industries in Underdeveloped Countries."
Economic Development and Cultural Change 9: 52-63.

This paper examines the relationship between industries and the birth rate with the intention of drawing whatever pertinent lesson there may be for problems of economic development. It is found that employment in nonagricultural industries carried on, at, or very near the residence of the woman, and under conditions in which she can combine home and work duties, is conducive to significantly higher fertility--i.e., higher than her fertility would be if she works away from home.

- Janowitz, B. S.
1971 "An Empirical Study of the Effects of Socioeconomic Development on Fertility Rates." Demography 8: 319-330.

Using equations derived from the cross-section and time series data from five European countries during the period that their fertility fell, it is shown that predictions about past fertility changes are in error. The results suggest caution in the use of cross-section relations to predict the course of fertility in developing country.

- Janowitz, Barbara S.
1976 "An Analysis of the Impact of Education on Family Size."
Demography 13: 189-197.

The author develops and empirically examines a model which decomposes the impact of education into its direct effect (holding labor force participation and age at marriage constant) and indirect effect (varying labor force participation and age at marriage).

- Johnson, B. F. and A. J. Meyer
1977 "Nutrition, Health, and Population in Strategies for Rural Development." Economic Development and Cultural Change 26: 1-23.

This paper examines some of the interrelations between socio-economic development and the reduction of fertility and considers priorities among the various components of a strategy for rural development. One of the major conclusions of this study is the need to give a higher priority to rural development and to the expansion of agricultural production on a strategy involving broad participation of the farm population in the process and improvement of nutrition and health and to foster wide diffusion of family planning in rural areas.

- Jones, Huw R.
1977 "Fertility Decline in Barbados: Some Spatial Considerations."
Studies in Family Planning 8: 157-163.

This study relies upon an areal analysis approach to examine spatial patterns of fertility in Barbados at two time periods, 1960 and 1970. Consideration is given to sex ratios, social class, lack of female education, female employment, and family planning activity to account for spatial patterns of fertility differentials.

- Karadayi, F., S. Timur, M. Macura, S. Yener, H. Cillov, H. Tezmen, S. Uner,
and H. A. Kisnisei
1974 The Population of Turkey. Ankara: The Institute of Population Studies, Hacettepe University.

This work is an extensive study on factors related to population in Turkey such as employment, education, labor force participation of women, practice of birth control, etc. The book is rich with data.

Kasarda, John D.

1971 "Economic Structure and Fertility: A Comparative Analysis." Demography 8: 307-317.

This study empirically investigates the relationship between the economic structure and the level of fertility, using data from censuses recently conducted in some 50 nations. Findings show that high rate of female labor force participation outrides home and low rate of economic activity of children depress fertility level.

Knodel J. and V. Prachuabmoh

1974 "Demographic Aspects of Fertility in Thailand." Population Studies 28: 423-448.

This study reveals that rural women in Thailand experience the highest fertility. Women who marry at older age or who experience disruption of their marriage are more likely to have fewer children ever born.

Kocher, James E.

1973 Rural Development, Income Distribution, and Fertility Decline. New York: The Population Council.

This work examines the process of rural development with special emphasis on the relationship between components of the rural development and fertility behavior and population growth in low-income countries. The author advances a major hypothesis that "the greater the extent to which the rural population is participating in development, the earlier and more rapid will be the decline in overall fertility and population growth rates." Included among the broad topics discussed are the meaning of development, population prospects, the record of rural development in low-income countries, and rural development and fertility decline.

1976 "Rural Development and Demographic Change in Northeastern Tanzania, New Perspectives on Demographic Transition. Occasional Monograph Series No. 4 Washington, DC: Interdisciplinary Communication Program, Smithsonian Institution.

An analysis of the social, cultural, educational, health, and economic changes that have occurred in four rural areas in northeastern Tanzania in relation to fertility change. This analysis was based on interviews of adult members of 1,492 households conducted in a 1973 survey of the four rural areas of northeastern Tanzania. "Data reveal that considerable social, cultural, health, education, and economic changes have occurred in all four rural areas during the past 50 years. Changes were uneven, and where changes were greatest there was a rise in the proportion of women who want no more children despite having small-than-average families."

Krishnamaurty, K.

- 1966 "Economic Development and Population Growth in Low-Income Countries: An Empirical Study in India." *Economic Development and Cultural Change* 14: 7-77.

This study estimates the impact of economic development, as reflected in per capita income and other related variables, on birth and death rates in India for the period of 1922-60 and the results confirm the theoretical expectations.

Krueger, A. O.

- 1974 *Foreign Trade Regions and Economic Development: Turkey*, New York: National Bureau of Economic Research.

This volume discusses and analyzes Turkey's trade and payment regions and its impacts upon Turkish economic growth.

Landau, Y. H. and A. Rokach

- 1971 "Rural Development in Israel," Pp. 486-500 in R. Weitz (ed.), *Rural Development in a Changing World*, Cambridge: MIT Press.

This article describes the process of rural development in Israel since the early years of statehood.

Leibenstein, Harvey

- 1974 "An Interpretation of the Economic Theory of Fertility." *Journal of Economic Literature* 12: 457-479.

This paper reviews and evaluates the major economic theories of fertility along with his own theory. A partial list of elements that are considered to be important in reducing desired and/or actual fertility is presented.

- 1976 "Relation of Economic Development to Fertility." Pp. 473-508 in L. Tabah (ed.), *Population and Economic Development in the Third World*. International Union for Scientific Study of Population.

This paper is an extension of his work of 1974. The purpose is to consider the economic forces that accompany the process of economic development and that, in turn, influence change in fertility. The focus has been on the stage of the economic transition prior to the relatively high per capita income levels that are associated with modern lower fertility levels.

- Lele, Uma
1975 The Design of Rural Development, Baltimore: The John Hopkins University Press.

In this book, the author discusses rural development perspectives and practices in Africa and draws on evidence from seventeen rural development programs in sub-Saharan Africa to examine the impact of development programs on low-income rural populations. Also, the author identified some of the more basic issues such as land distribution policies, pricing and marketing, manpower, and credit policies that demand attention in order to reduce the gap between overall rural development objectives and actual performance.

- Li, Wen L.
1973 "Temporal and Spatial Analysis of Fertility Decline in Taiwan. Population Studies 27: 97-104.

This paper examines the role of family planning programs in inducing fertility decline in Taiwan and it is stipulated that the dynamics of Taiwan fertility changes may be related to declining infant mortality and accelerating educational development rather than the family planning programs.

- Lorimer, Frank
1954 Culture and Human Fertility. Paris: United Nations Educational, Scientific, and Cultural Organization.

This is an extended theoretical examination of the social organizational factors affecting fertility with special references to the role of kinship structure.

- Malassis, L.
1966 Economic Development and the Programming of Rural Education. Paris: United Nations Educational, Scientific, and Cultural Organization.

This paper is a tentative essay considering rural development in the context of over-all economic growth and agricultural education in reference to the educational system as a whole.

- Malgskar, R. D.
1971 "Industralization of Rural Areas in Developing Countries," Pp. 124-135 in R. Weitz (ed.), Rural Development in a Changing World, Cambridge: The MIT Press.

This article discusses programs of industrialization in rural India with an attempt to examine their impact on the rural areas and suggests strategies for development of industries in rural areas.

- Mauldin, W. Parker, Bernard Berelson, and Zenas Sykes
1978 "Conditions of Fertility Decline in Developing Countries, 1965-75." Studies in Family Planning 9:89-148.

A macro analysis of correlates of fertility decline in developing countries of Asia, Latin America, and Africa during the period 1965-75. Education, health, economic status, status of women, population policy and family planning program activities are the correlates of fertility decline examined in the study.

- Maurer, K. M., R. Ratajczak and T. P. Schultz
1973 Marriage, Fertility, and Labor Force Participation of Thai Women: An Econometric Study. Santa Monica: The Rand Corporation.

This joint study seeks to formulate, list, and integrate the components of a theory of fertility as part of a general view of the family decision-making process in Thailand.

- McCabe, James L. and Mark R. Rosenzweig
1976 "Female Employment Creation and Family Size." Pp. 322-352 in Ronald G. Ridker (ed.), Population and Development: The Search for Selective Interventions. Baltimore: Johns Hopkins University Press.

The authors present an argument for encouraging greater female labor force participation as a means of accelerating smaller family size in less developed countries. A framework and methodology are proposed for investigating the impact that such a policy can have on fertility decline in the less developed countries.

- McGreevey, William P., Nancy Birdsall, James Creager, Anne McCook and Bernice Slutsky
1974 The Policy Relevance of Recent Social Research on Fertility. Occasional Monograph Series No. 2, Washington, DC: Interdisciplinary Communications Program, Smithsonian Institution.

A report designed to illuminate the potential relevance of recent social research on the correlates of fertility to decision-making for population policy and implementation. The report includes an analysis of the adequacy of this research as well as research on the effectiveness of family planning programs. Also, the report provides a research agenda believed to be amenable to yielding information that can assist decisionmakers in the mobilization and allocation of resources for population programs.

- McGreevey, William P. and Holmes, David N.
1975 "Population Impact on the Development Perspective ICP/Smithsonian Institution"

This study attempts to identify and assess the impact of specific government policies on fertility in Pakistan. Consideration is also given to policies, programs and projects which have specific objectives other than that of effecting the rate of population growth. From the standpoint of education, the study argues that, in keeping with the findings of others, increased education for greater number of

people will have little short term impact upon fertility. The authors argue, however, that the consequences of increased education opportunities, especially more education opportunities for women, will "combine to reduce fertility by about 8%."

McWilliams, John

1974 "Social Development in Africa: The Case of Family Planning." Canadian Journal of African Studies 8:91-107.

The author discusses the possibility of implementing effective family planning programs in Africa without major alterations in the social and economic structure of African society. In addition, the author discusses alternative population programs that may be more appropriate for the developing African nations.

Michaely, Michael

1975 Foreign Trade Regions and Economic Development: Israel, New York: National Bureau of Economic Research

This book reviews and examines the Israelic economy and seeks to develop a framework for analyzing the impact of exchange control liberalization on economy.

Miller, Karen A. and Alex Inkeles

1974 "Modernity and Acceptance of Family Limitations in Four Developing Countries." Journal of Social Issues 30: 167-188.

This article provides a relatively extensive review of the literature on the relationship between societal modernization processes, modernization at the individual level, and the acceptance of family size limitations. The major objective of the article, however, is to test a model which posits that individual modernizing experiences (e.g. education/literacy, mass media exposure, urbanism of residence, occupation and living standard) predict psychological modernity, which in turn predicts acceptance of birth limitation.

Mincer, Jacob

1963 "Market Prices, Opportunity Costs and Income Effects." Pp. 67-82 in Carl Christ (ed.), Measurement in Economics. Palo Alto: Stanford University Press.

This paper pinpoints a class of specification biases that effect the estimation of parameters of economic relations; such biases are a result of neglecting easily overlooked or misunderstood price variables. Price variables are fixed in cross-section study, and cannot be left out of the analysis without creating misinterpretations of income effect.

Mitani, Katsumi

1968 "Key Factors in the Development of Thailand." Pp. 159-210 Committee for Economic Development (ed.), Economic Development Issues: Greece, Israel, Taiwan and Thailand.

This article describes the development program in Thailand since

World War II through 1966 and evaluates the role of the government in guiding the economic development.

Mitchell, Robert E.

- 1972 "Husband-Wife Relations and Family Planning Practices in Urban Hong-Kong." *Journal of Marriage and the Family* 34: 139-146.

This paper focuses on features within the conjugal relationship that activates couples who are predisposed to practice family planning to take positive actions on the matter. The study reveals that women are more likely to practice family planning if they have high levels of influence over family decision-making and have high levels of communication with their spouses.

Mueller, Eva.

- 1971 *Agricultural Change and Fertility Change: The Case of Taiwan*. Ann Arbor: University of Michigan, Department of Economics, Mimeographed.

The paper examines the shift in tastes among farmers for modern consumer durables goods in relation to fertility reduction in Taiwan.

- 1972 "Economic Motives for Family Limitation: A Study Conducted in Taiwan." *Population Studies* 26: 383-402.

The paper examines the economic motives of the family limitation by emphasizing the cost of childbearing and childrearing and the foregone opportunity for mother to seek outside employment. Further, the shift in taste from children to consumer durable plays an important role, too.

Mueller, Eva.

- 1976a "The Economic Value of Children in Peasant Agriculture." Pp. 98-153 in R. A. Ridker (ed.), *Population and Development*. Baltimore: The Johns Hopkins University Press.

This work re-examines and confirms the hypothesis that high-parity children has negative economic value and hence slow the development process. For the analysis, the author considers to what extent in peasant agriculture, male and female children contribute to household expenses, earnings, and savings at various stages and for various family sizes.

- 1976b "The Impact of Agricultural Change on Demographic Development in the Third World." Pp. 307-345 in L. Ta-ah (ed.), *Population Growth and Economic Development*. International Union for the Scientific Study of Population.

This paper examines the impact of economic policy on population growth in less developed countries. The argument is that as agricultural development proceeds, farmer income and other economic variables undergo large changes. This transformation of the farm

household's economic environment is postulated to have an ultimate effect on fertility decision, though the impact is to a large extent indirect.

Mueller, Eva and Richard Cohen

1977 "The Relation of Income to Fertility Decisions in Taiwan." Economic Development and Cultural Change 25: 326-347.

The paper is concerned with the income-fertility relation in Taiwan in 1969. The key finding is that the demand for children does not seem to be subject to an appreciable income effect in those less developed countries where most couples live somewhat above the barest subsistence level. While there is evidence that change in taste and economic attitudes are responsible for some of the fertility decline which accompanies economic development, it is unlikely that these are the only economic factors at work.

Notestein, F.

1945 "Population--The Long View." Pp. 39-45 in T. W. Schultz (ed.), Food for the World. New York: John Wiley and Sons.

This work examines culture and desired family size.

Oshima, Harry and W. H. Lai

1971 "Experience of Labor Absorption in Postwar Taiwan." Paper Presented at the Conference on Manpower Problems in South and Southeast Asia, Singapore, Mimeographed.

This paper investigates the impact of rural development on non-farm employment opportunity for farmers and their children during the postwar period in Taiwan. This outside occupation has become a very important source of income for the farm households.

Paydarfar, A. A. and M. Sarram

1970 "Differential Fertility and Socioeconomic Status of Shirazi Women: A Pilot Study." Journal of Marriage and the Family 32: 692-699.

The hypothesis of the inverse relationship between socioeconomic status and differential fertility is re-examined among 641 Shirazi married women of childbearing age in the City of Shirazi, Iran. The findings show an inverse relationship between the socioeconomic status and fertility rate and that the richer and more educated couples tend to opt for smaller family size.

Psitos, D. A.

1969 "Postwar Economic Problems in Greece." Pp. 22-77 in Committee for Economic Development (ed.), Economic Development Issues: Greece, Israel, Taiwan, Thailand. Supplementary Paper, No. 25.

The study identifies the main factors that have an effect--either positive or negative--on the economic growth of Greece during the entire postwar period through 1966. It also discusses the role of government in guiding or influencing these factors.

- Raper, A. F.
1953 Rural Taiwan--Problems and Promise. Taipei, Taiwan: China-America Joint Commission on Rural Development.

The purpose of this work is to provide a record of the findings of an in-depth rural study carried out in late 1952 in 16 representative areas in Taiwan.

- Ravenholt, R. T. and John C. Chao and Laura Slobey
1977 "Comparative Impact of Family Planning Programs Upon Fertility in Developing Countries." A paper presented at the Annual Meeting of the Population Association of America (April).

A comparative analysis of the impact of family planning programs on fertility in developing countries. The authors note the changes in world population policies and contend that developing countries can take effective action to rescue themselves from excessive fertility through implementing effective family planning programs.

- Repetto, Robert G.
1972 "Son Preference and Fertility Behavior in Developing Countries." Studies in Family Planning 3: 70-76.

This paper reports the results of a study to test a widely-discussed hypothesis about fertility behavior in some less developed countries in Asia and Africa: that the total fertility of couples is directly influenced by the desire to ensure with a high probability, the survival of one or more sons to maturity, whether or not the couples fall within the relatively small subpopulation who have adopted modern techniques of fertility control. The author concludes that son preference is not a factor that influences actual fertility levels and suggests that decisions on family size are more likely to derive from economic considerations.

- 1976 "Direct Economic Costs and Value of Children." Pp. 77-97 in R. G. Ridker (ed.), Population and Development. Baltimore: The Johns Hopkins University Press.

This paper explores the current state of knowledge regarding the effects on fertility decision of changes in direct economic costs and value of children. It also seeks to identify promising means of policy intervention that would reduce fertility in the less developed countries through government action.

Ridker, Ronald G.

- 1969 "Desired Family Size and the Efficacy of Current Family Planning Programmes. Population Studies 23: 279-284.

The author discusses the inconclusive state of evidence from several countries on the adequacy of family planning programs in terms of the provision for supplies, services, and education and the belief that the desire among couples to limit family size is sufficiently large. The author proposes that if the fertility rate is to be reduced, additional methods such as monetary incentives seem to be necessary.

- 1976 Population and Development: The Search for Selective Interventions. Baltimore: The Johns Hopkins University Press.

A selection of essays on hypothesized socio-economic determinants of fertility assumed to be amenable to policy manipulation in a direction favorable to fertility decline. Income and its distribution, education, value of children, mortality, nutrition, and labor force participation are among the socio-economic variables regarded as determinants of fertility. Many of the essays contain policy implications and policy and program recommendations.

Ridley, Jeanne C.

- 1959 "Number of Children Expected in Relation to Non-familial Activities of the Wife." Milbank Memorial Fund Quarterly 37: 277-296.

This study considers the non-familial activities-fertility hypothesis which suggests a negative relationship between non-familial activities of the wife and fertility because of the incompatibility of non-familial and housewife and mother roles. The analysis of this hypothesis reveals that labor force participation has a depressing effect on fertility and is a major factor in the wife's decision to limit family size.

Rosenman A. and G. N. Sykiankis

- 1971 "Rural Development in Greece," Pp. 501-531 in R. G. Ridker (ed.), Rural Development in a Changing World. Cambridge: The MIT Press.

"Farming in Greece is both a means of earning a living and a mode of life in Greece." This paper describes the history of rural development since World War II.

Schultz, P.

- 1967 A Family Planning Hypothesis: Some Empirical Evidence from Puerto Rico. Santa Monica: The Rand Corporation.

An analysis of the hypothesis that the frequency of the birth in a population can be understood in terms of three factors that affect the desire for birth: a family size goal, the incidence of death among offsprings and the effect of uncertainty in the family formation process.

- 1969 "An Economic Model of Family Planning and Fertility." *Journal of Political Economy* 77: 158-180.

The paper presents an economic model of family planning and proceeds to apply it to explain differences in birth rates among municipalities in Puerto Rico overtime. It is found that the three major factors that affect parents' desire for births are: the numbers of surviving children, the incidence of death, and uncertainty in the family formation process.

- 1970 "Fertility Patterns and Their Determinants in the Arab Middle East." Santa Monica: The Rand Corporation.

This paper attempts to sketch the economic consequences of rapid population growth. The author presents a multivariate statistical analysis of factors affecting fertility in Egypt.

- 1972 "Explanations of Birth Rate Changes over Space and Time: A Study of Taiwan." Santa Monica: The Rand Corporation.

This is an examination of change in age-specific birth rates in several hundred small communities in Taiwan from 1964 to 1969 to obtain more information on the dynamic nature of a model of fertility variation.

- Shevasunt, Somphong, Dennis P. Hogan, and Kwanchai Thaithong
1978 "Fertility and Family Planning in Rural Northern Thailand." *Studies in Family Planning* 9: 212-221.

A review of family planning activities in Thailand along with an assessment of whether widespread adoption of family planning and/or fertility declines have occurred among a rural population that has not undergone substantial social and economic development.

Simon, Julian L.

- 1969 "The Effect of Income on Fertility." *Population Studies* 23:327-341.

Both cross-sectional and time-series data have generally shown an inverse relationship between income and fertility. But short-period time series data over the business cycle have shown a direct relationship. This paper seeks to resolve this paradox by arguing that it arises from a statistical illusion--specification bias due to omitted lagged variables.

- 1976 "Income, Health and Their Distributions as Policy Tools in Fertility Control." pp. 36-76 in R. G. Ridker (ed.), *Population and Development*. Baltimore: John Hopkins University Press.

This paper evaluates various policies intended to reduce fertility in less developed countries by means of changing people's income and wealth. The author concludes that the immediate effect of a rise in income in a traditional subsistence agricultural setting is to increase fertility. However, over the long run, fall in fertility and rise in income go together, after the initial rise in fertility. The long-run linkages between rise in income and decline in fertility are much less clear than is the absent overall empirical relationship.

- Simons, S. B.
1974 "Ambivalence toward Small Families in Rural Latin America." *Social Biology* 27: 323-344.

The purpose of this paper is to analyze social definitions of 'large' and 'small' families in rural Latin America and to examine perceptions of advantages and disadvantages associated with family size.

- Spear, A., M. Spear, H. S. Lin
1973 "Urbanization, Non-Familial Work, Education and Fertility in Taiwan." *Population Studies*: 27-323-334.

This work explores the effects of female labor force participation, education and urbanization on fertility behavior of young wives. The analysis is based on interviews with 3590 women in Taiwan, aged 18-39 in the fall of 1971. The results show that if education is controlled, neither work experience or urban-rural background has much effect on the desired number of children.

- Standing, Guy
1978 *Labor Force Participation and Development*. Geneva, Switzerland: International Labor Office.

This monograph focuses on the economic determinants of labor force participation in low-income industrializing economies. A great deal of emphasis is placed on examining factors influencing the changing economic role of women such as health and nutrition, unemployment, education, and fertility.

- Stavis, Benedict
1974 *Rural Local Government and Agricultural Development in Taiwan*. Ithaca, New York: Cornell University, The Rural Development Center for International Studies

This work describes and analyzes rural local governance and agricultural in Taiwan with an attempt to understand how and under what circumstances rural political institutions influence the patterns of agricultural and rural development. It is found that local government has been very important in generating agricultural change and assuring that most rural people get some benefits from change.

Stevens, R.D.

1976 "Comilla Rural Development Programs to 1971." Pp. 95-128 in R.D. Stevens, H. Alavi and P.J. Bertocci (eds), Rural Development in Bangladesh and Pakistan. Honolulu: The University Press of Hawaii.

This article focuses on the nature and status of six major rural development programs originating at the Academy for Rural Development in Comilla, Bangladesh. The study reveals that the social and economic transformation of low-income developing societies is dependent upon the continuous flow into rural areas of investments in modern technology with high economic returns.

Stycos, Mayone and Robert H. Weller

1967 "Female Working Roles and Fertility." Demography 4: 210-217.

Using survey data gathered in Turkey in 1963, the relationship between female employment status and fertility is examined. Controlling for urban-rural residence, education, and exposure to conception within marriage, no difference in fertility by labor force status appears.

Stycos, J. Mayone

1968 Human Fertility in Latin America. New York: Cornell University Press

This book provides a sociological perspective on fertility in Latin America. The author's point of departure is a general discussion on the world population problem, Latin America population problem, and the attitudes of Latin American intellectuals toward the population problem. The author proceeds to assess the influence of Latin America social norms and a structure on fertility. In this regard, the attitudes toward family size and birth control practices are discussed along with the impact of family stability, female employment, education, and urbanization on fertility. Finally, the author discusses prospects for enhancing fertility control in Latin America.

Stys, W.

1957 "The Influence of Economic Conditions in the Fertility of Peasant Women." Population Studies 11: 136-148.

In this paper, which is based on an inquiry carried out in 20 villages in Southern Poland, the author examines the fertility of two consecutive generations of peasant women. It is found that the richer the couples are, the more children they have. This is due to the earlier marriage of wealthier peasant girls, who thus begin to bear children sooner, and also bear them more frequently and for a longer period.

Teitelbaum, M.S.

- 1975 "Relevance of Demographic Transition Theory for Developing Countries." Pp. 174-179 in P. Reining and I. Tinker (eds), Population, Dynamic Ethics, and Policy. Washington, DC: American Association for the Advancement of Science.

The paper examines demographic transition theory and concludes that the theory offers only partial explanation of European trends and ambiguous advice for developing countries.

Tsuchiya, Keizo

- 1972 "Population Growth and Technological Progress in Japanese Agriculture." Seminar on Effects of Agricutural Innovations in Asia on Population Growth, Manila, Mimeographed.

This work provides an extensive analysis of the impact of technological progress on economic growth and population decline. One of the key findings was, that farmers who are more receptive to new farming methods tend to be more inclined to adopt birth control practices.

Tsui, Amy Ong and Donald J. Bogue

- 1978 "Declining World Fertility: Trends, Causes, Implications." Population Bulletin 33:3-42.

The focal points of this paper are: (1) an examination of the evidence that the world's fertility has declined in recent years, (2) an analysis of the factors which appear to be associated with the apparent world's fertility decline and (3) implications for fertility and population growth rates to the end of the century. Based on compilation of estimates available for all nations of the world, the authors derive estimates which indicate that the total fertility rate declined from 4.6 to 4.1 births per woman between 1968 and 1975, due largely to the unanticipated rapid and universal decline in the fertility of less developed countries. The relationship of several socio-economic development indicators and the 1972 family planning effort with fertility was empirically examined. The socio-economic development indicators included per capita gross national product, percent of the population living in urban areas, infant mortality rates, life expectancy at birth, percent of employed women working in agriculture, percent literate of the population, and male and female school enrollment ratios. The authors indicate that the socio-economic progress made by the LDC's during the period was not significant enough to account for more than a small proportion of the fertility decline and the organized family planning programs were a major contributing factor. The authors predict that by the year 2000 less than a fifth of the world's population growth (2.1 percent or more annually). However, they warn that this prediction is premised upon a continued organized family planning effort.

Tsui, Amy Ong, Jay D. Teachman and Donal J. Bogue

1978 "Predicting Fertility Trends in LDC's Over the Next Century."
A paper presented at the Meeting of the Population Association
of America, Atlanta, Georgia.

As a means of predicting fertility trends in LDC's over the next century, the authors of this study: (1) present an assessment of the world and regional fertility situation in 1968 and 1975 and the amount and tempo of change over that period; (2) analyze the assumed causal factors of the fertility change (both socio-economic and demographic factors, including family planning effort; and (3) provide a translation of the rate of decline in total fertility over the century of 2075 for three developing regions--Asia, Africa, and Latin America and 15 heavily populated countries. The authors suggest that their analysis confirms and strengthens what others have noted with regard to the efficacy of family planning as a means of regulating population growth and facilitating overall social improvement. To maintain and even accelerate the rate of fertility decline, the authors believe that it will be necessary to intensify resource inputs into organized family planning programs in LDC's.

Weller, Robert H.

1969 "Role Conflict and Fertility." *Social and Economic Studies* 18:263-272.

This paper examines the relationship between mother and worker roles and concludes that in less developed countries there tends to be an absence of conflict between these roles.

Weintraub, R.

1962 "The Birth Rate and Economic Development." *Econometrica* 30: 812-817.

This study estimates the effect of economic growth on the birth rates and finds that infant mortality and urbanization all will reduce fertility but the income effect appears likely to keep higher birth rate.

Williams, Anne D.

1975 "Determinants of Fertility in Developing Countries." Pp. 119-159 in M.C. Keeley (ed.), *Population Public Policy and Economic Development*. New York: Praeger Publishers.

This article reviews and evaluates available literature on the determinants of fertility in developing countries.

Williamson, J.

1970 "Subjective Efficacy and Israel Family Size as Predictions of Favorability Toward Birth Control." *Demography* 7: 329-340.

This study is an assessment of the relevance of subjective efficacy and ideal family size as predictors of favorability toward birth control. It is found that the effects of ideal family size and subjective efficacy are generally strongly related to those of education and the other variables that are considered.

Yang, Jae Mo, Sook Bang, Myung Ho Kim, and Man Gap Lee
1965 "Fertility and Family Planning in Rural Korea." *Population Studies*
18: 237-250.

This article reports on the preliminary results of a research project designed to demonstrate and assess the impact of family planning-educational and clinical services on fertility rates in two rural Korean townships. Data are presented and analyzed from two surveys of a random sample of residents in each of the townships. The first survey covered attitudes and practices related to family planning. The second survey, conducted after over a year of intensive family planning programming in the townships, focused on changes that had occurred in fertility rates and in the practice of contraception control. Both townships were of similar size and characteristics, however, the family planning program in one of the townships was considered to be more intensive than in the other.