Cultural and economic factors in the fertility of Thai women

Dennis P. Hogan,
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PAPERS
OF THE
EAST-WEST
POPULATION
INSTITUTE

NUMBER
107

SEPTEMBER
1987

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Number 107 • September 1987

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Library of Congress Cataloging-in-Publication Data

Hogan, Dennis P.

Cultural and economic factors in the fertility of Thai women / Dennis P. Hogan, Aphichat Chamratrithirong, and Peter Xenos. xiii, 32 p. 23 cm. (Papers of the East-West Population Institute, ISSN 0732-0531 ; no. 107)

"September 1987."

Bibliography: p. 27-32.

ISBN 0-86638-103-1 : $3.00

1. Fertility, Human--Thailand. I. Aphichat Chamratrithirong, 1948- . II. Xenos, Peter, 1943- . III. Title. IV. Series.

HB1054.55.A3H64 1987

304.6'32'09593--dc19

87-21459

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PREFACE

This research was supported by a grant from the Rockefeller Foundation's Research Program on Women's Status and Fertility. Any opinions, findings, conclusions, or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of the Rockefeller Foundation. We thank Mary Brinton, Karen Mason, William Parish, and Herbert Smith for helpful comments on earlier drafts of this paper.

Partial support for this publication came from a cooperative agreement with the Office of Population, U.S. Agency for International Development.

ABSTRACT This study investigates the effects of three aspects of women's status on the fertility of Thai women. These include marriage arrangements, patterns of intrafamilial decision making, and women's human capital skills and economic activities. The analysis is based on data collected in the 1979 Asian Marriage Survey in Thailand. A multiple classification analysis is used to investigate fertility beyond the second birth. Survival tables and multivariate proportional hazards models are used to study differentials in the rate at which women with two children have a third birth. We test the hypotheses that the effects of these women's status variables on fertility are (1) greater in an urban setting than in a rural setting, and (2) increased after the Thai reproductive revolution. We identify cultural differences in fertility decisions between ethnic Thais (who have a bilateral kinship system with uxorilocal residence) and Thai Chinese (who have a patrilineal, virilocal kinship system).

BACKGROUND

The United Nations (1984, 1985) has estimated that between 1960-65 and 1980-85 Thailand experienced a 44 percent decline in its fertility rate, with the total fertility rate declining from 6.4 to 3.6 children per woman. This fertility decline is among the most rapid ever recorded for a population and was achieved primarily by means of increased contraception (Knodel, Chamratrithirong, and Debavalya 1987). By 1984, 65 percent of currently married women of ages 15-44 were practicing contraception and nearly all of these (96 percent) were using an effective method (Kamnuansilpa and Chamratrithirong 1985).

This rapid change in Thai reproductive behavior has been characterized aptly by demographers who have documented this fertility transition as a "reproductive revolution" (Knodel, Chamratrithirong, and Debavalya 1987). These researchers have suggested that four factors combined to produce the fertility transition: (1) rapid and fundamental social changes that increased the perceived costs of children; (2) a latent demand for effective fertility control for at least a generation before the fertility transition began; (3) the unique receptivity of Thais to deliberate fertility regulation as an innovative adaptation to changing social circumstances, which is associated with the relatively high degree of female autonomy, the focus of reproductive decision making with the couple rather than larger kin group, and the Theravada Buddhist emphasis on individual responsibility; and (4) the effectiveness of organized efforts to increase awareness of and accessibility to effective and acceptable means of fertility regulation. The finely textured community studies by Lauro (1979) and Podhisita (1985) provide considerable supporting evidence for this account.

Although the combination of these variables, unique to contemporary Thailand, seemingly has produced an unusually rapid decline in fertility,

the components of this explanation reflect more general ideas about the causes of fertility declines (Coale 1973; United Nations, Department of Economic and Social Affairs 1973; Bulatao and Lee 1983). Such features of social development as the shift in the family economy from a subsistence to a market orientation and the introduction of secular, state-sponsored compulsory education have increased both the direct and the opportunity costs of children, thereby lowering fertility demand (Caldwell 1982; Oppong and Haavio-Mannila 1979; Hogan and Frenzen 1981). The mortality declines associated with modernization, meanwhile, have increased the supply of surviving children. Organized family planning programs appear effective in helping to diffuse modern methods of contraception, facilitating the new effort toward family-size limitation (Mauldin 1983; Retherford and Palmore 1983; Chamratrithirong, Morgan, and Rindfuss 1985).

The status of women

In recent years it has become apparent that little variance in the fertility behavior of individuals is accounted for by standard socioeconomic variables. At the population level, measures of social and economic development have proven inadequate as explanations for fertility reduction through family-size limitation (Van de Walle and Knodel 1980). Meanwhile, demographers trained in the social sciences have been attracted increasingly to contextual explanations of behavior over the life course. Cultural influences on reproductive behavior; historical, social, and institutional arrangements; and age and gender stratification are elements of these contextual explanations (Elder 1978).

Demographers have become increasingly aware of the possible effects of the varying roles and status of women as causes of fertility decline (Mason 1983). Prominent features of women's status that are recurrently mentioned include marriage circumstances, patterns of intrafamilial decision making, and women's human capital skills and economic activities.

Normative beliefs about family-building behavior are first acquired in childhood through family socialization. In societies where children are of considerable economic value to their parents, there typically are normative supports for large families (Caldwell 1982). Such norms are particularly strong in patrilineal societies in which son preference is strong and women depend on their sons for support in old age (Cain 1984). Families may be able to enforce conformity to high fertility norms through parental control of mate selection, marriage arrangements, and the control of material resources through dowry payments and inheritance patterns. Such control probably is more effective in situations in which the couple lives with the husband's family. Such patterns are very common in South Asia and among traditional Chinese, including Thai-Chinese.

The situation is quite different for ethnic Thais among whom the family is organized on the basis of bilateral kinship and inheritance and there is relatively little interest in family genealogy. Marriage is mainly by personal choice, with some preference that the spouse be ethnic Thai and that the families be of more or less equal economic status (Foster 1975; Lauro 1979; Kaufman 1960; Smith 1973; Wijeyewardene 1967).

Foster (1975) has constructed a folk model of the traditional Thai household developmental cycle based on the following residence rules: (1) after a young couple marry, they live with the wife's family (this allows them to save resources for their own household); (2) the couple stays with the wife's parents until their next daughter marries and brings her spouse into the household—then the older couple leaves to establish an independent household; and (3) when the youngest daughter marries, she and her husband stay permanently to care for her parents and inherit the house.

However, the extent to which individuals adhere to these norms of behavior in their own residential decisions varies. Thailand has been characterized as having a "loosely structured" sociocultural system in which individuals exercise a substantial degree of latitude in their conformity to norms (Embree 1950). Although this notion of a loosely structured society has engendered much controversy, evidence from the 1979 Asian Marriage Survey in Thailand demonstrates more diversity in marital experiences than strict adherence to agreed-on patterns of behavior would have permitted (Chamratrithirong 1983).

Foster (1975) suggests, on the basis of his anthropological study of two rural villages in central Thailand, that the traditional residential rules are generally followed with the exception that more sons live with parents than expected. Moreover, with the increasing movement of young people from the villages, it is less necessary for children to spend time with their parents to accumulate resources (since they typically enter nonagricultural employment), so that all children have about an equal chance to remain in the household. This deviation from the traditional pattern may result from recent population pressures on land and the related fragmentation of holdings, as well as the attractive opportunities found in Bangkok and elsewhere.

These aspects of the Thai family system may enhance the position of the wife as she works out the patterns of family decision making and the roles and responsibilities that will characterize her marriage. This feature of Thai society has often been noted as one reason for its especially rapid fertility reduction (Knodel, Chamratrithirong, and Debavalya 1987).

Cultural norms about husband and wife roles and their implications for family-building behavior can also reflect influences from outside the family. Greater individual autonomy and more equal female roles are charac-

teristic of the Theravada Buddhism practiced by most Thais, whereas Islam appears to reinforce male dominance (Knodel, Chamratrithirong, and Debavalya 1987).[1] The mass media and formal schooling may enhance personal modernity, promoting the adoption of a small family size (Fawcett and Bornstein 1973). Caldwell (1982) has argued that the introduction of formal education into a population establishes the idea of extrafamilial sources of authority, reduces the value and increases the costs of children, and enhances the decision making power of women of reproductive age within the family. Although various factors have been identified as ultimate causes of greater female equality within the family (e.g., Oppong and Church 1981), the feature of immediate relevance is the extent to which females make or influence decisions that affect the allocation of family resources, including time devoted to work roles in the home (Mason 1983).

Economic theories have directed attention to the importance of female education and training as skills are forms of human capital investment that increase the potential wages a woman can earn, thereby increasing the opportunity costs associated with childbearing and childrearing (Easterlin 1978; Birdsall 1977). Women who capitalize on such human capital by becoming gainfully employed in the labor force, especially those with more skilled and better paying jobs, experience opportunities that compete with traditional wife and mother roles (Oppong and Abaya Mamula 1979; Cochrane 1979). Such competing roles also give women greater access to extrafamilial sources of information and resources, increasing their potential autonomy in reproductive decision making (Caldwell 1982) and improving their ability to prevent unwanted births through knowledge of effective contraception.

However, Mason and Palan (1981) point out that such effects are not uniform. Acceptable childcare arrangements and the location and nature of work activities determine the extent to which work is compatible or incompatible with childbearing. Opportunity structures for household economic accumulation are important in this regard, with their effects depending on the importance of wage labor and the potential economic contributions of mothers and children.

Available evidence suggests that the social and family context affects the ability of women to earn substantial returns to their skills and schooling. Returns to human capital are greater in social environments with a more diversified labor force and differentiated wage structure, typically cities (Cochrane 1983). Female roles within the family and the degree of sex-role

1 This argument suggests that religion has its major effects on fertility through cultural norms that regulate appropriate age and gender roles. We believe that specific religious doctrines on fertility and contraceptive practice have minor influences because they are frequently contradictory, often misunderstood, and, in any event, widely ignored (as, for example, with views toward abortion among Thai Buddhists).

equality between spouses also is of importance, insofar as many occupations require women to work outside of the household and are not compatible with childcare.

These explanations of fertility decline implicitly assume that the number of children a couple has is the result of a decision-making process. In the simplest scenario, the costs and benefits of an additional child are determined, and the couple will continue having additional children until the net value of another child is negative, at which time they will limit their fertility.

However, evidence from the demographic history of Europe and selected Asian nations (including Thailand) shows that fertility regulation in a population need not appear in response to social and economic changes that alter the net value of children. In many populations it appears that the critical factor is the recognition by couples that family size is subject to rational decision making and control (Coale 1973; Van de Walle and Knodel 1980; Knodel, Chamratrithirong, and Debavalya 1987). This perspective suggests that fertility behavior is influenced by rational planning considerations, including attention to the costs and benefits of children, only after couples recognize that fertility limitation is possible. If this explanation of the fertility decline in Thailand is valid, we would expect to find evidence of limited effects of women's status variables on fertility prior to the Thai reproductive revolution, and a rather large impact afterward.

Hypotheses

On the basis of this prior research, we formulated the following hypotheses.

1. Traditional Thai marriage forms consisting of individual selection of spouse with parental consent, a formal marriage ceremony, a brideprice, and uxorilocal postnuptial residence are conducive to limitation of family size. We expect, therefore, to find an association between marriage form and family size among ethnic Thais who differ in their adherence to these marriage patterns, as well as between ethnic Thais and the Thai-Chinese.

2. Women with greater individual autonomy and power in family decision making are more likely to limit their family size than are couples in which the male is dominant. This hypothesis assumes that because women experience the increased opportunity costs of childbearing more directly than their husbands, they are more inclined to favor fertility reduction. This premise seems soundly based in Thailand (Shevasunt and Hogan 1979) but need not apply in all societies (Mason 1983).

3. Women who are more educated, who are in the paid labor force, and who hold higher-status, better-paying jobs have lower fertility than other women. We expect these effects to be greatest among urban residents because of the more differentiated economic opportunity structure of the city.

4. Women with greater individual autonomy and power in the family are especially able to earn a return on human capital investments, and therefore they are more likely to limit their family size.

5. The effects of these women's status variables on fertility were minimal prior to the reproductive revolution in Thailand. By 1970, family size was within the calculus of rational decision making, and the effects of women's status variables on fertility increased substantially.

Fertility over the life course

It is useful to view the family-building behavior of women as continually evolving over their life course as they age in changing social environments (Elder 1974, 1978; Featherman 1983).[2] These social environments are demarcated by the experiences and opportunities associated with power and access to economic resources in the community, within the coresidential family, and among extended kin. To understand fertility decisions, it is necessary to consider historical changes in the social environment and the ways in which social environments vary across the life cycle (Mason 1983). Thus, to understand why a couple has an additional birth or limits their fertility, it is necessary to study the situation of that couple at the time they were assessing the desirability of another child and deciding whether to practice contraception (Ryder 1973; Cambodian 1972).

Research on Thai fertility has repeatedly demonstrated that most Thais desire at least two children, and there is no evidence of a move toward childlessness or a one-child family even among the most recent marriage cohorts. The 1984 Contraceptive Prevalence Survey indicates that only 7 percent of rural women and 10 percent of urban women who had married in the preceding five years wanted fewer than two children. The modal family size desired was two children (56 percent of rural and 61 percent of urban women). About one-quarter of both the urban and rural women desired three children, and only about one in ten preferred four or more children. Behavioral data indicate that very few women voluntarily have fewer than two children.

Thus, the key family-building decision point for Thai couples comes after the birth of the second child with the decision to limit the family size to two children or to have a third child. Couples then sequentially decide about higher parity births, and these decisions jointly determine the num-

2. Focus group discussions with Thai men and women of different ages show that older men and women are quite conscious of the changing social and economic situations in which they made their fertility decisions. These changing circumstances frequently are pointed to as the reasons why they practiced contraception to limit their family size (Knodel, Chamratrithirong, and Debavalya 1987).

ber of additional children a couple has beyond the minimal two-child target. In this paper we focus on these critical fertility decisions.[3]

DATA

This project uses data from a detailed longitudinal survey of representative population samples of Thai women of reproductive age from rural and urban areas of central Thailand. The Asian Marriage Survey in Thailand (AMS) was conducted during December 1978 and April 1979. The data were collected through personal interviews by carefully trained female interviewers. The AMS collected extensive social, economic, and demographic data on women of reproductive age, their parents and siblings, their husbands, and other members of the coresidential household. The AMS asked detailed questions on the normative values pertaining to marriage and childbearing and on the origins of those values, and it measured the extent to which those values were adhered to in actual behavior. Most important for this study, the AMS collected complete retrospective event history data from the respondents about their education, residence, labor force participation and occupation, marriage, and fertility experiences over their life span. The event histories record every status change or status and dates of changes in each of these life domains (Smith and Chapon 1978; Chapon 1979). The AMS also interviewed the husbands of the female respondents. These data are not used in this analysis.

One must exercise caution in the analysis of retrospective data owing to occasional failure to recall events or incorrect dating of those events (Potter 1977). Nevertheless, such longitudinal data are essential for a careful life-course analysis of demographic behavior (Featherman 1980). Research on response reliability suggests that Thai respondents are at least as accurate as American respondents in providing basic demographic information (Knodel and Prachuabmoh 1977). Furthermore, the AMS used rigorous methods to train and closely supervise the eight interviewers. Field experience demonstrated that the life-history matrix (which facilitates comparisons of activities across life domains at each age) was an effective method for helping respondents recollect their life histories. This claim is supported by tabulations of the AMS event history data that indicate the histories are virtually complete for most respondents and provide no evidence of age heaping or other systematic biases at the aggregate level.

[3] We attempted to use a retrospective question on ideal family size to determine whether additional births beyond the second were wanted or unwanted. This analysis did not produce meaningful results, presumably because of the obvious difficulties involved in the use of such a crude and unreliable indicator of prior fertility intentions (Knodel and Prachuabmoh 1977). We therefore restrict our analysis to differentials in recorded fertility behaviors.

The rural sample was drawn from a group of three adjacent *tambol*, geographically and socially defined as one community, located near the center of Viseschaichan District, Angthong Province, approximately 70 kilometers from Bangkok. This community included nineteen villages with a total of approximately 2,238 households. Fourteen of the villages were selected for inclusion in the study. An attempt was made to interview all ever married women of ages 15–44. Altogether 657 ever married women in these villages were finally interviewed.

The urban sample was based on the Master Sample of the Bangkok Metropolis which was developed by the Department of Applied Statistics, National Institute of Development Administration in 1978 (Suwatti and Sarasengchan 1978). This sample consists of 200 randomly selected blocks, representing more than 9,000 blocks of 24 administrative divisions in the Bangkok Metropolis. From the 200 blocks in the Master Sample, 24 blocks were randomly selected for inclusion in the AMS. Within these 24 blocks, interviews were conducted with all ever-married women between ages 15 and 44, producing a total of 515 interviews.

The AMS included a third sample stratum representing urban squatters not resident in the established areas of the Bangkok Metropolis. This sample was drawn by interviewing all ever married 15–44 year-old women resident in eighteen of fifty-seven blocks in the Slum Klong Toey, yielding completed interviews with 307 women. We have not included this slum population in our analysis of urban Thai behavior because of its extreme social, economic, and residential heterogeneity. For this analysis, however, we have combined data for the Thai Chinese living in this slum with that of other urban Thai Chinese interviewed in the AMS. This was done to increase the sample size for this group. Exploratory tabulations indicated that rate of the third-parity progression among the Thai Chinese did not differ significantly between the two sample strata.

To avoid an overrepresentation of early marriers in our urban and rural samples, we have restricted this study to women of ages 26 and older (an age by which 90 percent of Thai women marry). The analysis is based on currently married women with both the husband and wife in their first marriage to avoid fertility differentials arising from complex marital histories. Because we are interested in fertility beyond the second birth, we have restricted our attention to women who had at least two children, with the second birth occurring between 1960 and 1976. The urban population included only those women who were already resident in Bangkok by the date of their second birth. These restrictions result in an analysis sample of 287 rural women (all ethnic Thai) and 202 urban women (of whom 126 were ethnic Thai and 76 were Thai Chinese).[4]

4 There is no agreed-upon definition of Chinese ethnicity in Thailand. We have classified as Thai-Chinese a woman who was an urban resident if either her mother or

SAMPLE CHARACTERISTICS

We begin by describing the characteristics of these mothers with two children on various dimensions of women's status, including their marriage arrangements, patterns of intrahousehold decision making, and human capital skills and economic activities. We also compare the rural and urban Thais and the Thai Chinese to determine differences between them in the status of women who had two children and were deciding whether to have a third. The social status and modernity of the women's family, taking into account the husband's characteristics, are also described.

Marriage arrangements

A Thai woman has a major role in the selection of her spouse (Table 1). More than four-fifths of the rural and urban women sampled had a period of courtship with their husbands prior to marriage. Sixty-nine percent of the rural women and 79 percent of the urban Thais selected their spouses. Courtship was less common among the Thai Chinese (64 percent), and only 11 percent of the Thai Chinese women acted alone in selecting their husbands.

Relatively few of these women married prior to age 18 in any of the strata, although such marriages do exist (Table 1). Rural women marry somewhat earlier than urban women, with the latter being somewhat more likely to delay marriage until age 25 or later. The Thai Chinese displayed less variability in age at marriage, with 47 percent marrying at ages 20–22, and their average age at marriage was intermediate between that of the rural and urban Thais.

Roughly one-fourth of the brides were of higher status than their husbands and another one-fourth were from lower-status families, displaying only modest differences between the groups (Table 1). The traditional brideprice was more common among rural than among urban Thais (60 percent versus 44 percent). A brideprice was paid in 37 percent of the weddings of the Thai Chinese. In short, although the payment of a brideprice is the norm in rural areas, it is not so common in the urban areas, and all groups display considerable flexibility in the payment of the brideprice.

Three-quarters of the rural women married men from their own villages (Table 1: coded from husbands' and wives' responses regarding whether they changed their village of residence at the time of marriage). Only 40 percent of the urban Thais and 23 percent of the Thai-Chinese married men from the same village as their family. After marriage, nearly

father was born in China or if her marriage ceremony included Chinese rituals. An inspection of persons so classified suggests that these procedures correctly identified a group of women who themselves were of Chinese ethnicity or were married to a Thai-Chinese husband.

Table 1. Marriage arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

Independent variables	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai-Chinese	
	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Courtship before marriage						
Yes	82.6	58.6	80.6	56.7	64.1	66.5
No	17.4	60.0	19.4	56.6	35.9	76.5
Role in spouse selection						
Bride alone	69.3	59.8	79.1	59.8	41.0	69.1
Parents or others	30.7	56.8	20.9	45.0	59.0	70.5
Age at marriage				**		
17 or younger	12.9	59.5	10.9	71.4	5.1	50.0
18–19	26.8	59.9	19.4	68.8	12.8	80.0
20–22	32.1	63.0	27.9	56.0	47.4	73.9
23 or older	28.2	52.6	41.9	47.6	34.6	63.6
Brideprice		**				
Yes	59.6	55.7	44.2	59.1	37.2	75.9
No	40.4	63.5	55.8	54.7	62.8	66.2
Marriage form		***		**		
Traditional or formal	69.3	54.5	69.8	53.2	94.9	72.2
Elopement or living together	30.7	68.9	30.2	64.5	5.1	25.0
Relative status of bride				**		
Bride higher	27.3	59.3	22.1	53.8	18.3	46.2
Equal	46.5	57.1	52.5	37.3	54.9	67.2
Groom higher	26.2	59.2	25.4	78.3	26.8	89.3
Village endogamy						**
Yes	75.3	56.8	40.3	52.7	23.1	90.5
No	24.7	65.0	59.7	59.3	76.9	63.9
Residence after marriage		***				
Uxorilocal	48.8	58.9	17.3	56.2	9.0	85.7
Virilocal	17.8	72.6	24.4	61.3	46.2	72.7
Neolocal	33.4	51.5	58.3	56.5	44.9	63.3

* $p < .15$.

** $p < .10$.

*** $p < .05$.

half of the rural women lived uxorilocally, that is, near their parental family. Uxorilocal residence was much less common among the urban Thais (47 percent) and rare among the Thai Chinese (9 percent). The Thai-Chinese were about equally likely to live virilocally (near the husband's family) or neolocally (in a new location away from both families) after marriage, whereas ethnic Thais not living near the brides' parents most commonly lived neolocally (see also Limanonda 1979, Chamratrithirong, Morgan, and Rindfuss 1985).

Women's status

Comparisons of the educational level of the husband and wife is one common indicator of the relative status of each (Mason 1983). In the urban population, husbands tended to have higher educational levels than their wives (60 percent of the Thais and 52 percent of the Thai Chinese, see Table 2). The relative education of rural husbands and wives was typically equal (with each having four years of schooling). Only 28 percent of the rural men had higher educations than their wives.

This analysis includes two direct measures of the power of the female to make decisions that affect the allocation of family resources, including

Table 2. Intrafamilial power arrangements and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai-Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Relative educational level of spouses						
Husband greater	28.2	52.4	60.3	52.6	52.0	78.5
Wife equal or greater	71.8	62.0	39.7	61.5	48.0	64.2
Equality of roles		*				
Low	55.7	56.2	48.8	63.8	64.1	72.6
High	44.3	62.3	52.4	49.4	36.0	65.2
Wife's involvement in decisions						**
Low	59.2	58.7	57.9	61.0	58.4	65.3
High	40.8	59.2	42.1	53.8	41.6	75.3

* $p < .15$.

** $p < .10$.

*** $p < .05$.

time devoted to work roles in the home. The first of these is an index of sex-role equality based on the sum of three variables, which each measure (on a five-point scale) the extent to which the wife disagrees with statements that work should be strongly sex typed, that the wife should not expect the husband to help around the house, and that it is acceptable for men to go out alone as often as they want. The second of these direct measures is an index of wife's involvement in decision making based on the sum of three variables, which each measure on a five-point scale the extent to which the husband or wife decides which couples to see most often, about the purchase of major household items, and how much money the family can spend on food. The index includes a fourth variable that measures the extent to which the wife disagrees with the statement that the husband should make important family decisions.

The high degree of female involvement in family decision making among ethnic Thais is apparent in these data (table 2). Fifty-two percent of urban Thais and 44 percent of the rural Thais sampled revealed a high degree of sex-role equality (scores of 8–15) compared with only 36 percent of the Thai Chinese. The higher degree of sex-role equality among urban Thais is not translated into a greater involvement of the wife in family decisions, however, with about 42 percent of each of the groups classified as highly involved (scores of 13–20) in family decisions.[5]

Human capital and economic activity

The AMS includes data on the wife's occupational experiences at key points in her married life, and this analysis includes a measure of the educational attainment and occupational activity of the wife at the beginning of the third parity interval (table 3). Most Thais of reproductive age have four years

5. The variables forming these indexes were ascertained with reference to the date of the 1979 survey. They may provide an inaccurate indicator of these variables during the third-parity interval if they have changed over time. These measures may yield biased results for the effects of women's roles on fertility to the extent that these roles are reciprocally affected by the fertility behavior of the couple. We think that the effects of fertility on intrahandhal power arrangements are probably greatest at the time of the first birth. We believe that reciprocal effects are unlikely to be a problem in this analysis as we are dealing with women who have already had at least two children. If the fertility effect on the wife's power are cumulative with cumulative fertility, however, then the problem may be serious. This is an important issue for all analyses of cross-sectional data sets and calls for careful evaluation as more appropriate data become available.

6. Comparison of these data with AMS data from rural Indonesia and the Philippines suggests that Filipino (Central Luzon) women in these samples had greater sex role equality (only 27 percent with low scores) and involvement in decision making (only 31 percent with low scores). In the Indonesia (Java) samples, sex role equality as measured here was very high (only 5.2 percent had low scores), whereas actual decision-making involvement was somewhat below the Thai level (63 percent with a low score).

Table 3. Human capital and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai Chinese	
Independent variables	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Education at second birth						**
0–4 years	85.0	60.2	81.4	56.2	87.2	76.0
5 or more years	15.0	51.2	18.6	58.8	12.8	30.0
Occupation at second birth						
Housework	17.8	59.1	36.4	66.9	59.0	70.3
Small trade, skilled farm	71.0	61.4	22.5	52.7	7.7	66.7
Skilled or white-collar	11.2	41.0	41.1	49.7	33.3	70.1
Wage work before marriage						***
No	72.1	59.7	47.3	59.6	61.5	77.8
Yes	27.9	56.8	52.7	54.6	38.5	57.3
Wage work after marriage				**		**
No	72.5	59.5	54.3	63.6	70.5	75.3
Yes	27.5	57.3	45.7	48.3	29.5	57.0
Opinion of work after marriage						*
Favorable	62.7	60.5	48.7	53.8	39.7	69.2
All right if necessary	23.7	60.3	23.3	64.2	33.3	73.1
Unfavorable	14.6	48.8	27.9	53.8	26.9	67.4

* $p < .15$

** $p < .10$

*** $p < .05$

of formal schooling, and relatively few women have higher levels of education regardless of social setting. There was remarkably little population variability in measures of formal and informal vocational training. This pattern in the survey sample is consistent with national distributions in the censuses of 1980. Only 27 percent of the rural women worked for wages before or after marriage. The urban women married at later ages and had greater opportunities to work at paid jobs (53 percent before marriage and 46 percent after marriage). Despite their relatively late marriages and the wage employment opportunities in Bangkok, only 39 percent of the Thai-Chinese worked for wages before marriage and 30 percent did so after marriage.

The lower rate at which rural women did wage work before or after marriage was a result of the limited opportunities for such labor in their agricultural villages, rather than a reflection of their opposition to such labor

(Table 3). In fact, two-thirds of the rural women favored work after marriage, compared with half of the urban Thais and only 40 percent of the Thai-Chinese. Some 82 percent of rural Thais were gainfully employed after the birth of their second child. By way of contrast, 63 percent of urban Thais and 41 percent of the Thai-Chinese were in the labor force after their second birth. Most rural women (71 percent) were employed at agricultural jobs, unskilled tasks, or small trade. Of those urban women who worked most were employed at skilled or white-collar jobs. Thus relatively high proportions, overall, of the urban Thais (42 percent) and Thai-Chinese (33 percent) were employed at skilled, clerical, and white collar jobs. Additional measures of human capital investment (wage work before and after marriage), work commitment (whether the woman ever stopped work for a reason related to her family), and respondents' attitudes about women working after marriage proved not to have consistent effects on the fertility of rural women (Hogan, Chamratrithirong, and Smith 1985). Exploratory tabulations provided similar findings for the urban residents.

To summarize these results, for rural women work outside of the home is compatible with child-rearing activities. Most rural women work outside of the home even after they bear a child. But that labor is most frequently unpaid work in a family enterprise, and few rural women have had experience earning wages. Urban Thais are much more likely to have worked for pay prior to becoming mothers. The majority work outside the home after their second child is born, but many of these women have reservations about wives working. When these mothers do work, they are likely to be employed at better paying jobs. For these women, there may be substantial opportunity costs associated with the birth of another child. The Thai-Chinese have fewer human capital investments, and most are already housewives. They would face relatively limited opportunity costs from the birth of a third child.

Family socioeconomic status

To control for the effects of family socioeconomic status on fertility, this analysis includes data on the husband's occupation and a measure of overall family socioeconomic status based on the number of modern goods (watch or clock, bicycle, radio, sewing machine, electrical appliances, etc.) in the household. About one-third of the rural men were farmers, but an equal number worked at various skilled craft and manual occupations. The husbands of the urban Thais most commonly were employed at skilled manual jobs, though fully one-third were white-collar workers. The Thai-Chinese husbands had very high status, with 69 percent employed at white-collar occupations. Differences in socioeconomic standing between the strata mirror these differences in husbands' occupations (47 percent of the rural,

74 percent of the urban Thai, and 95 percent of the Thai-Chinese women lived in households with five or more modern goods).

METHODS

This analysis focuses on the third-parity progression (i.e., the rate at which women with two children have a third child). In parity progression analysis, the subjects of interest are the rate at which a woman makes the transition from one birth to the next and differences (heterogeneity) in this rate between population groups. Furthermore, changes in this transition rate associated with the duration of the birth interval (nonstationarity) must be considered. The parameter that fulfills these criteria is the hazard rate.

The hazard rate describes the proportion of women who give birth during a specified time interval among all women who reach that interval without previously giving birth to a child of that order. The hazard rates for the third parity progression (the rate at which two-parity women have a third birth) for rural and urban Thais and Thai-Chinese are displayed in Figure 1. The VMS collected the event history data for annual rather than monthly units of time. Therefore, the hazard rates analyzed here refer

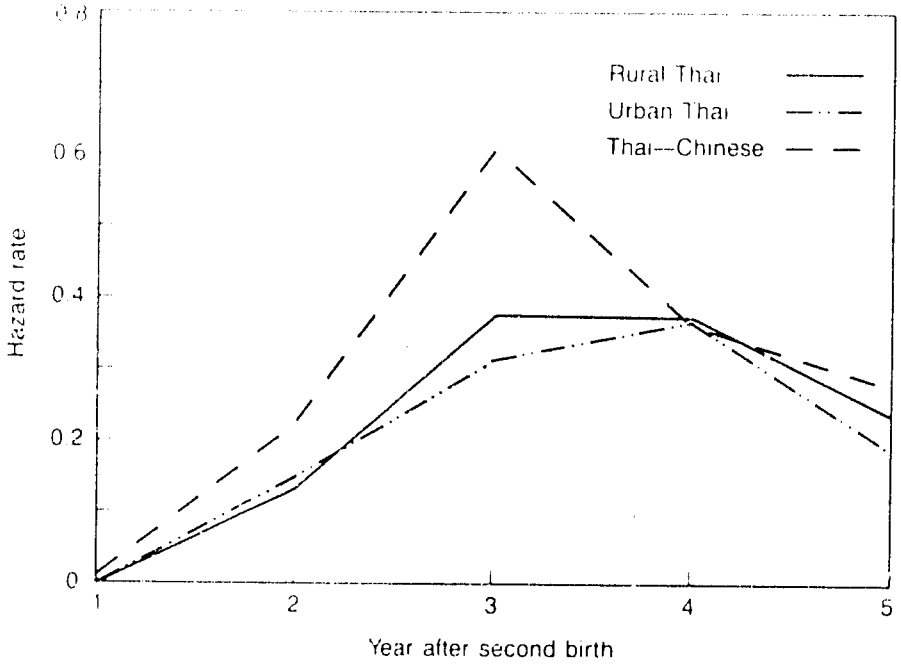

Figure 1. Hazard rate of third-parity progression among Thai women, by ethnicity and residence

to yearly intervals.) These rates indicate that Thai Chinese have much higher rates of third births during the first three years after the birth of the second child. For example, 60 percent (0.6055) of the Thai Chinese women who did not have a third birth within twenty-four months of their second child's birth had their third child within the next twelve months, compared with 37 percent (0.3736) of the rural women and 31 percent (0.3121) of the urban Thais.

Hazard rates can be cumulated using standard methods for demographic survival rates to determine the percentage of the population experiencing the parity progression by each age. Figure 2 displays the cumulative parity progression rates for third births based on the hazard rates of Figure 1. By the end of three years, 58 percent of the Thai Chinese had given birth to their third child, compared with only 37 percent of the urban and 40 percent of the rural Thais. The differences eventually converge somewhat (perhaps as a result of unintended births), but even five years after the second birth differences remain, with 78 percent of the Thai-

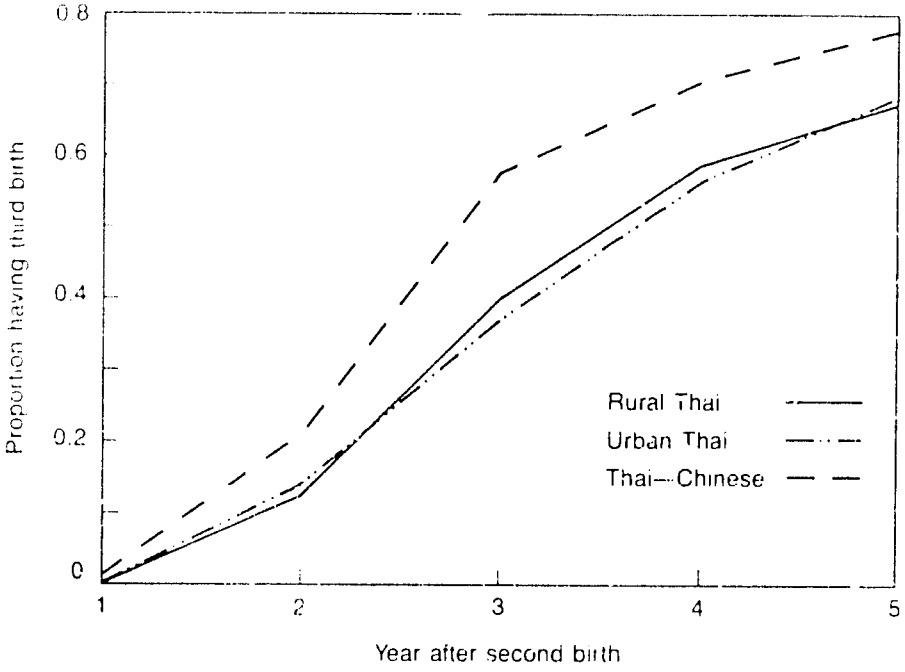

Figure 2. Proportion of Thai women having a third birth, by ethnicity and residence

Chinese, 68 percent of the rural Thais, and 64 percent of the urban Thais giving birth to a third child. In this analysis we use the percentage of women closing the birth interval within three years (derived from the hazard rate) as a convenient summary measure of overall differences in the underlying rates of parity progression for women in each of the strata classified according to their marriage arrangements, relative status, human capital skills and economic activities, and family socioeconomic status (Table 1.4).

After discussing these initial results, we estimate multiple classification analysis (MCA) models of the number of births beyond the second in order to summarize overall differences in the subsequent fertility histories of these two-parity women. These models show the net effect of each of the women's status variables on the subsequent number of children born, controlling for number of years since the second birth and age at second birth. These models are used to test for interactions between the measures of female role equality and other women's status variables.

Statistical methods also are available for the estimation of the net effects of multiple variables on a hazard rate (Tuma and Hannan 1984). With parametric models the analyst specifies the form of the time dependence of the hazard rate. Nonparametric models leave unspecified the way in which the hazard rate depends on time, but they assume that it has a similar form for each group being compared. (See Tuma and Hannan 1984 for a formal exposition on these models. Useful didactic discussions of the methods are found in Sørensen 1980 and Teachman 1982. For applications of these methods to demographic transitions, see Hannan, Tuma, and Groeneveld 1977; Sandefur and Scott 1981; Menken et al. 1981; and Hogan and Kitagawa 1985.) These models are analogous to a multivariable survival table and thus take into account the full experiences observed for the population at risk of the event. But the technique does not require the large numbers of cases that are required for such survival tables, which is an important consideration in situations where surveys with moderate sample sizes are being analyzed.

All of these models begin with the assumption that the effects of population heterogeneity are proportional at all times. That is, if some variable increases the rate of parity progression by a certain percentage at one time, it produces a similar proportionate increase in the rate at other times, even though the base rate may differ from one time to another. Though this assumption of proportionality is rarely met exactly, the models are relatively robust in providing an unbiased estimate of the average effect of a variable on the hazard rate.

In this paper we use the partial likelihood estimation procedures proposed by Cox (1972, 1975) to obtain the proportional increase or decrease in the hazard rate of the third-parity progression associated with the independent variables. This model leaves unspecified the time dependent

form of the hazard distribution associated with each parity interval. We also use these models for additional tests for interactions between gender equality in the family and other measures of women's status.

RESULTS

The third-parity progression

The effects of many aspects of marriage arrangements on the rate at which women with two children have a third birth can be seen in Table 1. The results are summarized using the percentage of women bearing a third child within three years of their second child's birth. Courtship before marriage and the bride's role in spouse selection were found not to be significantly related to parity progression. A later age at marriage was associated with a lower rate of third births, but only among urban Thais. Brideprice and parity progression rate were found to be significantly related only among rural women. Those women whose marriage required the payment of a brideprice tended to have fewer additional children beyond two. Marriage form was related significantly to fertility among Thai women in both rural and urban areas. Those whose marriages were traditional or formal tended to have a two-child family; those who just lived together as married couples or whose marriages were associated with elopement were more likely to have a third child. Among the Thai Chinese this relationship was not found.

Among the urban Thai women, marriage between bride and groom of the same status decreased significantly the parity progression rate. Those couples in which the bride's status was different from the groom's, especially when the groom's was higher, tended to have higher fertility. Childbearing and family size may be one mechanism among the urban Thai married couples for equalizing their status, especially when the women's initial status at marriage is lower. Thai-Chinese couples in which the bride was of lower status also showed this relationship, though the result was not statistically significant.

Village endogamy (that is, marriage between spouses from the same village) was found to be significantly related to the parity progression rate among the Thai-Chinese and was characterized by higher fertility. About 90 percent of the women who married husbands from the same village had a third child within three years of their second, compared with 64 percent of those who did not marry endogamously.

In the rural areas, virilocal residence after marriage was related to a larger family size (73 percent of such couples had a third birth within three years), compared with 59 percent of those who lived with the bride's family. Couples who lived neolocally after marriage were least likely to have a third child (52 percent within three years).

The measures of women's status within the family were not consistently related to the rate at which couples with two children had a third (Table 2). The relative educational levels of husbands and wives had no statistically significant effect on the rate of parity progression. As hypothesized, greater sex-role equality among rural women was associated with a somewhat lower rate of third births, but the relationship was opposite the expected direction and not statistically significant from zero among the urban Thais and Thai-Chinese. The wife's involvement in family decisions did not significantly affect the Thai couples' decision about a third child. Among the Thai-Chinese there is a statistically significant association, but the direction of the effect is opposite that hypothesized, with 75 percent of those wives highly involved in family decisions having a third birth within three years of the second birth, compared with 65 percent of wives who were less involved.

The effect of education and labor force characteristics of women on the rate of parity progression is investigated in Table 3. We hypothesized that education at the start of the third birth interval would be negatively related to the rate of the third births, but this result held only among the Thai-Chinese. These differences were large (76 percent of those with four years of schooling or less and 30 percent of those with five or more years of schooling had a third birth within three years) and statistically significant, although very few Thai-Chinese women had more than four years of schooling.

The hypothesized negative effect of wage work before and after marriage also characterized the Thai-Chinese, with fewer of those who had wage work experience having a third birth (Table 3). Among the urban Thai women, wage work after marriage was associated with a significant decrease in the likelihood of having a third birth (64 versus 48 percent). The woman's opinion about work outside of the home after marriage had an inconsistent relationship with the birth of a third child. Women who worked at skilled or white-collar jobs after the birth of their second child were less likely to have a third birth among both rural and urban Thais. But this difference was not statistically significant.

The husband's occupation was not statistically related to the rate of third births among these women (Table 4). Among urban women of low socioeconomic status, the recorded rate of a third birth was somewhat higher, but this result was not statistically significant.

MCA models of fertility

We next estimated a number of exploratory multiple classification analysis models of the total number of additional children born to two-parity women, controlling for the age of the woman at the birth of her second child and the number of years of exposure since the second birth. This analysis permitted us to measure simultaneously the effects of several of these varia-

Table 4. Family economic status and the percentage of Thai women closing the third birth interval within three years, by residence and ethnicity

Independent variables	Residence and ethnicity					
	Rural Thai		Urban Thai		Thai-Chinese	
	Distribution	Third birth	Distribution	Third birth	Distribution	Third birth
Occupation of husband						
Small trade or unskilled	12.4	64.7	19.4	54.2	4.1	100.0
Farm	34.2	56.9	0.0		0.0	
Skilled	35.6	56.6	46.8	52.5	27.0	66.7
White-collar	17.8	63.3	33.9	63.9	68.9	69.0
Ownership of modern goods						
Few	52.6	59.4	26.4	63.0	9.1	85.7
Many	47.4	58.3	73.6	54.4	90.6	67.9

Note: The significance test presented in this table reports the results of a Lee-Desu test for differences in the overall survival distributions.

bles on the total subsequent fertility behavior of these women. The MCA model facilitates the estimation of net effects and tests for interactions between the independent variables.

We began by combining the different variables indicating marriage arrangments into a single model to determine the net effect of each dimension of marriage and to test for interactions between the dimensions. We then estimated a second MCA model that focused on women's status within the home, a third for education and labor force experiences, and a fourth that considered husband's occupation and the measure of household socioeconomic level. From the results of these MCA analyses (not shown) and the parity progression survival analyses (Tables 1-4), we decided to focus on seven variables in the remainder of this analysis. These include marriage form, the payment of a brideprice, the equality of roles between husband and wife, the wife's involvement in family decisions, the wife's education and occupation at the beginning of the third-parity interval, and family socioeconomic status.

Taken in combination, these variables had statistically significant effects on the number of third and higher parity births of rural women and Thai-Chinese (Table 5). However, these effects were relatively modest among the rural women, accounting for only a 5 percent increase in explained variance. The effects of marriage form on fertility were not significant once other women's status variables were taken into account. The payment of a brideprice was associated with fewer additional children among rural

Table 5 Multiple classification analysis of the number of third and higher-order births among Thai women, by residence and ethnicity

Independent variables	Residence and ethnicity		
	Rural Thai	Urban Thai	Thai-Chinese
Marriage form			
Formal or traditional	1.43	1.38	1.67
Informal	1.37	0.95	1.10
Brideprice	*		**
Paid	1.22	1.07	1.98
Not paid	1.69	1.39	1.43
Equality of roles			
Low	1.42	1.37	1.70
High	1.40	1.13	1.54
Wife's involvement in decisions	*		
Low	1.53	1.33	1.70
High	1.24	1.13	1.56
Family's socioeconomic status		*	**
Low	1.50	1.60	0.83
High	1.31	1.13	1.72
Wife's education			**
0–4 years	1.41	1.30	1.76
5 or more years	1.40	1.05	0.77
Wife's occupation			*
Housework	1.37	1.34	1.40
Farm, unskilled, or trade	1.39	1.29	1.79
Skilled or white-collar	1.62	1.15	2.03
All variables	1.41	1.25	1.64
Increment to R^2 (% explained)	5.1	4.5	16.5
Significance of main effects	.010	.492	.024

Note: These MCA models include controls for the number of years between the second birth and the interview in 1975 and for the woman's age at second birth.

* $p < .1$

** $p < .05$

*** $p < .01$

women but higher fertility among the Thai-Chinese. Greater sex-role equality did not affect the number of additional children, although rural wives who were more involved in family decisions had about 0.3 fewer children. Women from higher socioeconomic status families had significantly fewer children in the urban areas. Among the Thai-Chinese the few women with five or more years of schooling had substantially lower fertility (0.99 fewer

children). The occupational activity of the wife after the birth of her second child did not affect the subsequent fertility of the rural women or the urban Thais. Among the Thai-Chinese the effects of occupational activity were marginally significant ($p < .15$) but opposite the expected direction.

We next tested for statistically significant interactions between female sex-role equality and the other measures of women's status (to test our fourth hypothesis). None of these were statistically significant at conventional levels ($p < .05$). Among rural women the only marginally significant interaction ($p < .08$) was that women with low sex-role equality who engaged in farm work had higher than expected fertility. It is probable that these women were engaged in farm work because of economic necessity. Among urban women the only marginally significant interaction ($p < .11$) involved the higher than expected fertility of women with low sex role equality who married through elopement or cohabited without marriage. The effects of other measures of women's status variables on fertility did not vary significantly ($p < .15$) by the extent to which these women were involved in family decisions in either the urban or rural populations. We did not do MCA tests for interactions between these independent variables among the Thai-Chinese because of the small number of sample cases.

Proportional hazards models

To confirm that these results were not simply the result of small sample sizes or censoring biases in the multiple classification analysis models, we pooled the urban and rural samples and estimated a Cox proportional hazards model for the third parity progression (tabulations not presented). When age at the beginning of the parity interval is controlled, women who were married in traditional or formal ceremonies had third births at a rate 22 percent lower than women who eloped or cohabitated without marriage ($p < .06$). The only other women's status variable that had even a marginal effect on the rate of third births was occupation at the beginning of the interval. Farm and unskilled laborers had an estimated third-birth rate 12 percent lower than that of housewives, and women in skilled and white-collar jobs had a rate 24 percent lower ($p < .16$). Further tests indicated no statistically significant interactions between the measures of sex-role equality and women's involvement in family decisions and the other independent variables.

As discussed in the first section of this paper, Knodel, Chamratrithirong, and Debavalya (1987) have highlighted four major factors in the Thai fertility decline. Two of these factors (social changes increasing the perceived cost of children and organized family planning programs) were largely absent in the early 1960s and emerged as factors of major importance only in the late 1960s and early 1970s. These changes in Thai society are believed to have created a social and environmental context in which the receptivity

of Thais to fertility control became actualized. If this theory is correct, we should find increases in the effects of the women's status variables in more recent years.

To test this hypothesis we reestimated the proportional hazards models discussed in the previous section for the populations of women who began their third birth interval during 1960–69 and 1970–76 (table 6). The only variable that affected the rate of third births among women who had their second child during 1960–69 was age of the mother at second birth (each additional year of age reducing the rate of a third birth by some 4 percent). None of the other variables affected the rate of third births. The rate of third births for women having their second child during 1970–76 was significantly affected by the mother's age at the start of the birth interval, the marriage form, and mother's occupational activity. Women who eloped or cohabitated without marriage had a third-birth rate 50 percent higher than that

Table 6. Proportional hazards model of the third birth rate among ethnic Thai women, by period

	1963–69			1970–76		
Independent variables	Multiplier of rate	Chi-square	*P* value	Multiplier of rate	Chi-square	*P* value
Age at start of inverval	0.958	2.15	.143	0.955	4.27	.039
Marriage form		0.97	.326		3.60	.058
Formal or traditional				1.000		
Informal				1.498		
Brideprice		0.13	.718		0.36	.551
Sex-role equality		0.01	.905		0.25	.618
Wife's involvement in decisions		0.05	.824		0.02	.874
Wife's education		0.40	.527		0.01	.914
Wife's occupation		0.00	.949		3.05	.081
1 = Housework				1.000		
2 = Farm, unskilled, or trade				0.798		
3 = Skilled or white-collar				0.637		
Ownership of modern goods		0.03	.864		0.02	.885
Fit of model (degrees of freedom)		2.10 (1)	.147		12.64 (3)	.006

of women who married in a traditional ceremony. Women with farm, unskilled, and small trade jobs had a third-birth rate 20 percent below that of women who were not in the labor force and women who worked in skilled and white-collar jobs had third-birth rates 36 percent lower. These findings support the hypothesis that the society-wide changes occurring in Thailand during the 1970s provided the social environment in which the low-fertility influence of the traditional Thai patterns of family formation and women's labor force involvement became actualized.

CONCLUSIONS

This analysis of individuals' behavior has yielded results supportive of the conclusions of Knodel, Chamratrithirong, and Debavalya (1987) about the Thai fertility decline. It appears that traditional Thai patterns of kinship and family, and of substantial female involvement in the labor force, provided a cultural base for family size limitation once the net economic value of children declined and acceptable and effective contraceptive methods became available. We did not find that the magnitude of these effects was substantially larger in Bangkok, perhaps owing to the considerable economic and social development that has occurred in rural Thailand. It should be noted, however, that the particular rural community examined in this study is located near Bangkok and has probably developed more rapidly than more remote rural communities, especially those in other regions.

These traditional patterns of kinship and coresidence and the greater labor force involvement and economic independence of women are the basis for claims that Thai women have a high degree of sexual equality (Nap 1985). Knodel, Chamratrithirong, and Debavalya (1987) have demonstrated that Thai Moslems (who lack such cultural traditions) persist in having larger numbers of children. Similarly, our analysis has shown that the Thai-Chinese also persist in having higher fertility than the Thais despite their higher socioeconomic standing and urban residence.

Taken in combination, these findings suggest to us that the Thai kinship system, organized on principles of bilateral kinship and inheritance, personal choice of mate selection, and uxorilocal or neolocal postnuptial residence, provided the critical cultural basis for Thailand's remarkably rapid decline in fertility. The social and economic arrangements found in patrilineal kinship systems appear to limit substantially the status of women and provide cultural props for high fertility not only in Thai Moslem and Thai-Chinese populations, but also in other nations (Cain 1984). In such societies, rapid fertility declines may require substantially higher levels of economic development. That is, the net value of children may have to become significantly negative before couples abandon high fertility traditions in favor of birth limitation.

Cultural arrangements determining the status of women appear to have pervasive effects on the fertility of all members of the population. We found no evidence that direct measures of women's status (sex role equality or involvement in family decision making) affect the fertility of women within a particular cultural setting. This research suggests that studies that focus on the kinship and economic arrangements that determine the status of women across cultural settings may be a more productive path of inquiry than studies that focus on the status of individual women within societies. Additional research is needed that focuses on the effects of women's status on fertility within and between societies to test this claim.

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