COMMUNITY AND CONTRACEPTIVE CHOICE IN RURAL THAILAND: A CASE STUDY OF NANG RONG*

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This paper blends quantitative with qualitative data in an investigation of community and contraceptive choice in Nang Rong, Thailand. Specifically, it develops an explanation of 1) method dominance within villages, coupled with 2) marked differences between villages in the popularity of particular methods. The quantitative analysis demonstrates the importance of village location and placement of family planning services for patterns of contraceptive choice. The qualitative data provide a complementary perspective, emphasizing the importance of social as well as physical space and giving particular attention to the structure of conversational networks.

Nang Rong district is one of more than 700 districts in Thailand, and occupies a relatively small geographic area in the northeast of the country. (See Figure 1.) Made up of poor farming villages, it is not an obvious setting in which to look for variation between villages in patterns of contraceptive choice. Nevertheless, a census of 51 villages conducted in April 1984 revealed a surprising variety of patterns. Typically one method predominated among users within a village, but villages varied greatly as to which method was most popular. It might be the pill, the IUD, injection, female sterilization, or vasectomy. What factors account for such strik-ing variation within a confined geographic area? This paper explores the origin and the maintenance of these patterns, drawing on both quantitative and qualitative data.

Although we focus here on contraceptive choice (that is, choice among an array of contraceptive methods, including the option of not using any method), the paper is oriented toward broad questions about the nature of community and the mechanisms of impact. Beginning with Freedman (1974), considerable work has been done on the effects of community factors (e.g., Brewster 1995; Casterline 1985; Entwisle, Casterline, and Sayed 1989; Phillips and Zimmerman 1993). Progress has been made, but studies to date have been hampered by a limited range of community variables, by their focus on easily measured aspects of communities, such as service delivery, and by the availability of individual data for only a sample within each community. In this paper we use a broad range of community variables to study the contraceptive choices made by *all* couples "at risk" in the 51 Nang Rong villages. Our quantitative analyses show the importance of accessibility and other structural characteristics.
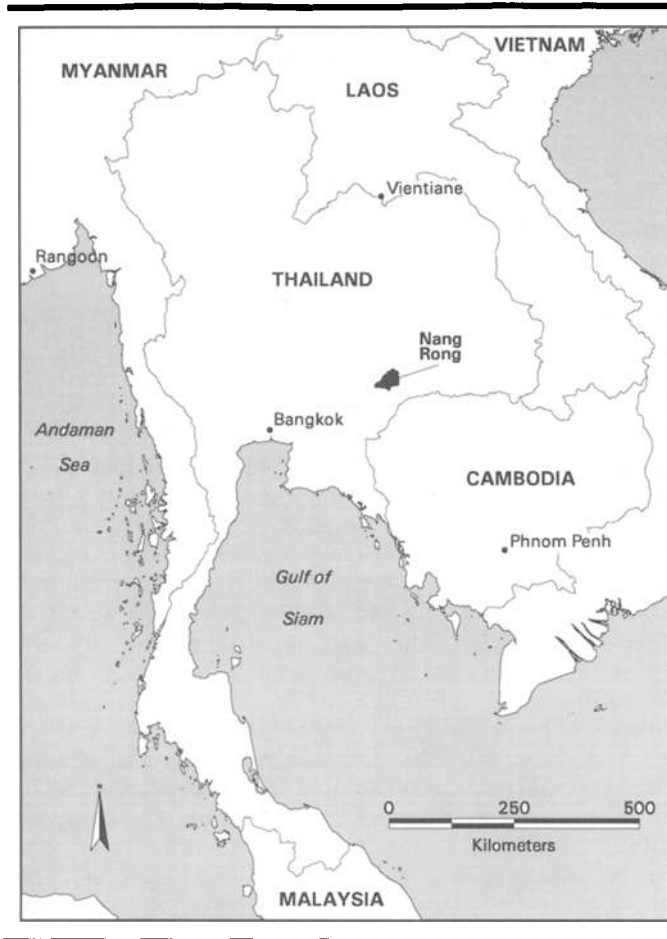
In addition, we find unmistakable "footprints" of a different type of community variable (Lee 1969; Rogers 1979; Rosero-Bixby and Casterline 1993; Watkins 1991). Specifically, we find evidence for the importance of the social community, bound together by social interaction. The qualitative data suggest that conversational networks help direct and control the flow of information about contraceptive methods. The structure of these social networks helps to account for method dominance within villages and also for marked differences in popularity of methods between villages. In the following sections we discuss first the quantitative and then the qualitative data, and we conclude with an account combining insights gained from both.

MULTILEVEL ANALYSES

Social demographic studies of communities and their effects typically specify a multilevel model relating measured characteristics of the community to the behavior of individuals, couples, and households. The community variables generally

FIGURE 1. MAP OF THAILAND, SHOWING LOCATION OF NANG RONG DISTRICT

reflect opportunity structure and normative context, although it is rarely possible to measure distinct social structural and cultural dimensions. Prior studies have produced a mixed picture of community effects. Accessibility of family planning, for example, has received particular attention. The local presence and density of family planning outlets should affect the costs of fertility regulation, and therefore contraceptive choice and (ultimately) fertility. Some studies document strong effects of accessibility (Cochrane and Guilkey 1991b; Tsui et al. 1981); others show effects conditional on childbearing desires (Entwisle et al. 1989; Entwisle et al. 1984); still others find few or no effects (Cochrane and Guilkey 1991a; Mason and Palan 1978). Working within this tradition, we hoped to improve on this earlier research, capitalizing on the strengths of the Nang Rong data.

One strength is the availability of census rather than sample survey data. We make use of a census of 51 villages conducted in 1984 to obtain baseline data for evaluating the Community Based Integrated Rural Development (CBIRD) Project. The household census recorded the contraceptive method used by each married woman of childbearing age in every household in the 51 villages. Among these women, 55% were using contraception, compared with 64% estimated for all of rural Thailand at that time (Kamnuansilpa and Chamratrithirong 1985:47); this difference was expected in view of the poverty and the relative remoteness of the district (Krongkaew, Chamratrithirong, and Woromotri 1983). In addition, contraceptive use patterns in the 51 villages varied substantially. Among the temporary methods, the pill was the modal choice in 38 villages, the IUD in nine, and injection in four. Method-specific prevalence rates varied from 0 to 41% for the pill, 0 to 30% for the IUD, 0 to 20% for injection, 0 to 45% for vasectomy, and 2 to 30% for female sterilization. Contraceptive prevalence ranged between 31 and 77%.

A further strength of the Nang Rong data is that households containing reproductive-age women in 1984 were followed up in 1988. The longitudinal data allow us to relate potential determinants of sterilization measured at one point in time to the *subsequent* decision to have a sterilizing operation; such a temporal order is not possible with cross-sectional data (Bumpass 1987; Rindfuss and Liao 1988). In contrast, the pill, the IUD, and injection involve current choices. We analyze choice of temporary method separately from sterilization because of the differences in the relationship between the current state (of using a particular method) and the decision leading to that state.

The analysis of temporary method choice is based on data for 2,703 married women age 20 to 44, not sterilized and not pregnant in 1984. Very few women marry during their teen years (Yodumnern-Attig 1992); thus we excluded those few 15- to 19-year-olds already married. The analysis of sterilization is based on 1,933 married women age 20 to 44 in 1984 (including women pregnant in 1984) and eligible to become sterilized in the next four years.

Another strength of the Nang Rong data is the breadth, depth, and quality of the community data collected in conjunction with the census. Through a group interview of the village headman and other knowledgeable residents, information was collected about a wide array of topics relevant to rural life. Drawing on information collected in this survey, and also aggregating data collected in the household census, we developed a list of village variables that might plausibly affect contraceptive choice. We considered any variable that 1) was related to availability of family planning, to the costs and benefits of children, or to the spread of new ideas, and that 2) varied enough between villages to potentially have an

TABLE 1. CHARACTERISTICS OF THE NANG RONG VILLAGES (1984)

Variable	Mean	Std. Dev.
USE OF CONTRACEPTIVE METHODS		
Percent married women 15–44 using the pill	35.3	18.0
Percent married women 15–44 using the IUD	15.7	16.6
Percent married women 15–44 using injection	10.7	9.3
Percent married women 15–44 who are sterilized, or whose husband is sterilized	46.1	19.9
AGRICULTURE		
Kilos of rice produced per rai of land	332	144
Whether any households are involved in jute production (1 = yes; 0 = no)	.471	.504
Gini index based on household ownership of cultivated land	.427	.045
Months of water shortage during previous year	2.62	1.38
Price of rice (bahts per kilo)	255	16.0
Whether rice merchant comes to the village (1 = yes; 0 = no)	.765	.428
Number of rice mills	2.76	1.63
MIGRATION PATTERNS		
Percentage of village population temporarily absent	4.98	1.94
Percentage of those temporarily absent who were in Bangkok	29.7	15.2
Percentage of those temporarily absent who were in Korat	13.4	10.1
SOCIAL DEVELOPMENT		
Years since village first electrified	.941	2.03
Presence of a newsstand (1 = yes; 0 = no)	.373	.488
Presence of a grade school (1 = yes; 0 = no)	.627	.488
Percentage of adult population with 5 or more years of schooling	16.9	6.83
Whether village committee has any female members (1 = yes; 0 = no)	.137	.348
ACCESSIBILITY		
Presence of health center in village (1 = yes; 0 = no)	.078	.271
Number of obstacles to travel to Nang Rong town	1.22	1.14

Note: Means and standard deviations calculated for 51 villages except in the case of months of water shortage during the previous year, where they are based on 50 villages.

empirical effect. (See Table 1.) We were optimistic that many of the village variables would help to explain differences between villages in contraceptive choice; in the end, however, we found that only four had any effect.

We model contraceptive choice as an outcome of individual, household, and community variables, along with selected interactions:

$$\log \frac{\Pr(M_{ij} = k)}{\Pr(M_{ij} = 1)} = \alpha_k C_j + \beta_k X_{ij} + \delta_k C_j X_{ij} + \mu_j \qquad (1)$$

The dependent variable for the analysis of temporary method choice is the log odds that couple i in village j chooses Method k (pill, IUD, or injection) relative to Method 1 (no method). The dependent variable for the analysis of sterilization is the log odds that a nonsterilized couple became sterilized by 1988 or was lost to follow-up, relative to remaining nonsterilized. Other than the formulation of the dependent variable, the two analyses are structured identically. C_j is a vector of attributes associated with village j; X_{ij} is a vector of characteristics associated with couple i in village j; $C_j X_{ij}$ represents selected interactions between village variables and the characteristics of couples. The village variables included in our analyses are whether a subdistrict health center is located in the village; remoteness, measured as obstacles to traveling to Nang Rong town; the productiv-

ity of rice (kg/rai of land); and involvement in jute production. The individual, couple, and household variables are wife's age, husband's age, whether the household is non-nuclear, education, occupation, landownership, and the value of agricultural assets. The μ_j in Eq. (1) denotes unobserved characteristics of the community affecting contraceptive choice. The effects of the unobserved community variables are presumed to be additive.

To obtain estimates of the coefficients in Eq. (1), and of their standard errors, we apply procedures described by Guilkey (1992), using standard multinomial logistic response estimates with standard errors adjusted for unobserved community effects. Tables 2 and 3 present the full set of estimates respectively for the analyses of temporary method choice and sterilization.

Tables 2 and 3 contain much that deserves comment. In keeping with the focus of the present paper, however, we restrict our discussion to the effects of the community variables. As an aid to interpretation, we rely on simulations; we concentrate on choice of temporary method because remoteness is the only village variable to affect sterilization. We simulate the proportions of couples using each temporary method, manipulating one or more independent variables of interest and holding constant the other independent variables.

To begin, we apply estimated coefficients to the actual values of the independent variables in the data set to generate the predicted probability that each couple will choose particular contraceptive methods. Then we average these predicted probabilities over all couples. We repeat the process after changing the independent variable(s) of interest. The simulations help to simplify the large number of coefficients estimated in a complex analysis.

Presence of a Subdistrict Health Center

The subdistrict health centers supply methods at the most local level in rural Thailand; in the early 1980s, they specialized in the pill (Bennett et al. 1990; Chamratrithirong and Kamnuansilpa 1984:222). Therefore we expected the presence of a subdistrict health center to encourage pill use, and we found this to be the case. (See Table 4.) We also found that the local presence of a family planning outlet affects the contraceptive behavior of some groups more than others: in the Nang Rong data, the strongest effects emerge for older women and for better-educated couples.

Let us consider the interaction between accessibility and age. Whereas the pill was used by 26% of young (age 20–23) women living in villages that lacked a subdistrict health center, the fraction increased to 40% when this source was present locally. Among older (age 36–44) women, the pres-

ence of a subdistrict health center led to more than a doubling of the proportions using the pill, from 22 to 56%. Not only is this increase larger than that found for younger women; in addition, its sources include a dramatic decline (20 percentage points) in the fraction not using any method.

Why are the effects so strong among older women? One possibility is that the convenience of resupply is especially relevant for long-time (and older) users. Resupply can be a nuisance over many years. Alternatively, this result may reflect the impact of initial choices of method: the older cohort probably made these choices during or just after the introduction of pills in the early 1970s (Chayovan, Hermalin, and Knodel 1984). In 1970, after declaring an official policy to reduce population growth, the Thai government proceeded quickly to make contraception available. Early emphasis was placed on the pill; in rural areas, pills were provided through preexisting health centers (Bennett et al. 1990). Both of these explanations attest to the force of "habit" (Camic 1986).

Presence of a subdistrict health center has substantial effects on use of the pill in each educational category. It encourages pill use especially among better-educated couples and causes these couples to avoid the IUD (otherwise their preferred method). Better-educated couples may be more pragmatic and therefore more likely to take advantage of local opportunities. Alternatively, they may have greater access to a range of choices, including contraceptive methods that may be difficult to obtain. These couples may be unaffected by distance and travel time *except* when a source of family planning methods is locally present.

Still another explanation stresses the persisting effects of choice of first method. We expect years of schooling to be associated inversely with year of first use, other things being equal. The earlier the first use (in terms of the history of the family planning program), the narrower the range of methods from which couples could choose. The presence of a subdistrict health center may have tilted the balance toward the pill, and current behavior might reflect the persistence of that early choice.

Remoteness

Initially we were surprised by the results obtained for this variable. The simulations presented in Table 5 indicate a positive rather than a negative relationship between remoteness and use. The more obstacles to travel between the village and Nang Rong town, the *greater* the likelihood of using a temporary method as opposed to no method. Selectivity is probably the explanation. Only *non*sterilized couples are in a position to decide whether to use a temporary method, and it is unlikely that they are a random sample of

TABLE 2. MULTINOMIAL LOGISTIC COEFFICIENTS FOR REGRESSION OF CONTRACEPTIVE CHOICE ON SELECTED INDE-
PENDENT VARIABLES: NANG RONG, 1984

Variable	Pill vs. None	IUD vs. None	Injection vs. None	IUD vs. Pill	Injection vs. Pill	Injection vs. IUD
Constant	−.061	−2.558*	−1.558*	−2.496*	−1.496*	1.000
	(.368)	(.458)	(.428)	(.591)	(.548)	(.674)
INDIVIDUAL AND HOUSEHOLD						
Age						
20–23	−.136	−.327	.409	−.190	.545	.735
	(.272)	(.445)	(.310)	(.513)	(.391)	(.522)
36–44	−.441*	−.307*	−.630*	.133	−.189	−.322
	(.153)	(.152)	(.197)	(.170)	(.222)	(.191)
Older husband	−.240*	−.491*	−.556*	−.251	−.316	−.065
	(.122)	(.160)	(.211)	(.154)	(.234)	(.263)
Extended household	−.287*	−.438*	−.454*	−.151	−.167	−.017
	(.118)	(.178)	(.194)	(.182)	(.193)	(.234)
EDUCATION						
Low	−.179	−.235	−.346	−.056	−.168	.111
	(.148)	(.211)	(.263)	(.239)	(.254)	(.330)
High	−.398*	.550*	−.631	.948*	−.234	−1.181*
	(.190)	(.202)	(.336)	(.248)	(.354)	(.407)
High-status occupation	−.099	.477	.129	.576*	.228	−.348
	(.198)	(.265)	(.277)	(.256)	(.326)	(.339)
Large landowner	−.389*	−.349	.265	.040	.654*	.614*
	(.118)	(.262)	(.205)	(.290)	(.238)	(.294)
Agricultural assets	.039	.021	.067*	−.018	.029	.046
	(.020)	(.027)	(.033)	(.031)	(.033)	(.039)
COMMUNITY						
Health center in village	.457	−1.678*	−.988*	−2.135*	−1.446*	.689
	(.253)	(.513)	(.295)	(.589)	(.322)	(.664)
Remoteness	.139	.341*	−.106	.203	−.244	−.447*
	(.076)	(.100)	(.138)	(.135)	(.160)	(.175)
Agricultural productivity	−.002*	.002*	−.0001	.004*	.002	−.003
	(.001)	(.001)	(.0006)	(.001)	(.001)	(.001)
Jute production	−.450*	.002	−.263	.452	.186	−.266
	(.193)	(.262)	(.262)	(.341)	(.315)	(.399)
INTERACTIONS						
Age 20–23 by extended household	−.592	−.543	−.831	.049	−.239	−.288
	(.308)	(.355)	(.483)	(.480)	(.478)	(.500)

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(Table 2 continued from previous page)

Variable	Pill vs. None	IUD vs. None	Injection vs. None	IUD vs. Pill	Injection vs. Pill	Injection vs. IUD
INTERACTIONS*(continued)*						
Age 20–23 by remoteness	.029	−.225	−.615*	−.254	−.643*	−.390
	(.179)	(.186)	(.153)	(.269)	(.224)	(.219)
Age 36–44 by health center	.912*	1.099*	—	.186	—	—
	(.378)	(.327)		(.547)		
High education by health center	.574	−1.557*	1.057*	−2.131*	.483	2.614*
	(.519)	(.531)	(.346)	(.740)	(.579)	(.696)

Notes: *$p < .05$ (two-tailed test). Chi-square = 379.9, df = 48. Number of couples = 2,703. Numbers in parentheses are standard errors. Variables are defined as follows (reference categories in parentheses, as appropriate): Wife's age: 20–23, (24–35), 36–44; Husband's age: (< 45), 45+; Household type: (nuclear), nonnuclear; education of husband and wife: either has received < 4 years, (both have 4), either has received > 4 years; occupation of husband and wife: either has a nonfarming job, (both farm); landownership: (40 rai or less), > 40 rai; household agricultural assets: logged value, in baht; presence of subdistrict health center in the village: yes, (no); remoteness: number of obstacles to travel to Nang Rong town, where obstacles include a distance of 20+ km, travel time > 60 min., travel difficulty for 4+ months of previous year, poor road conditions, and absence of bus service; productivity: kg of rice produced per rai of land; involvement in jute production: some households involved, (none involved).

all couples (a hypothesis confirmed by results in Table 3). Couples in more remote villages are *less* likely to have become sterilized between 1984 and 1988, and this pattern probably held before 1984. It is not that couples in remote villages are more likely to use any method of contraception; they are simply more likely to use a *nonpermanent* method. None of the other village variables significantly affects the decision to become sterilized between 1984 and 1988, so selectivity is probably not an issue in interpreting their effects on use of temporary method.

With respect to choice *among* temporary methods, remoteness is associated with a preference for the pill and especially the IUD, and with an avoidance of injection. Our interpretation stresses issues of access and convenience. Throughout Nang Rong district, obtaining contraceptive pills was relatively easy in 1984 (and still is). They were available from a wide variety of sources, public and private, including subdistrict health centers. Other methods, in contrast, required a trip to town (at that time). Accordingly, one might expect residents of more remote villages to avoid these methods. We find this outcome for injection, but not for the IUD. A possible reason for the latter is that women in remote villages neglect to have their IUDs checked routinely; thus IUDs, like sterilization, create no issue of resupply. Another possible explanation relates to women's embarrassment about having an IUD inserted. Their embarrassment might be lessened by greater physical (and social) distance between their home village and the health workers performing the insertion.

These interpretations assume that villages remote from Nang Rong town were also remote from other potential sources of the IUD, injection, and sterilization. In ongoing research, we are using spatial techniques to explore this assumption.

Crop Production

Presence of a subdistrict health center and obstacles to travel to Nang Rong town are characteristics of villages that bear directly on the accessibility of contraceptive methods as well as on the pros and cons of different choices. Other village attributes have more connection with the particular motivation to space or to limit births. In this light we interpret the effects of agricultural productivity and involvement in jute production.

Rice is the main crop grown in Nang Rong district; jute and cassava are important secondary cash crops. The amount of rice produced per unit of land is a major influence on the economic organization and financial standing of each village. The productivity of rice is likely to be high where there are efficient means to plant, irrigate, and harvest the crop, given appropriate inputs of fertilizer. In villages achieving high levels of productivity, extra children probably provide only limited economic advantage, although rice continues to be labor-intensive at planting and harvesting. Residents of these villages thus may desire smaller families, and consequently, may prefer a semipermanent method such as the IUD to a more temporary method such as the pill. This reasoning is

TABLE 3. MULTINOMIAL LOGISTIC COEFFICIENTS FOR REGRESSION OF STERILIZATION ON SELECTED INDEPENDENT VARIABLES: NANG RONG, 1984–1988

Variable	Sterilized vs. Not Sterilized	Follow-up vs. Not Sterilized	Lost to Follow-up vs. Sterilized
Constant	-1.064*	-.959*	.105
	(.291)	(.200)	(.262)
INDIVIDUAL AND HOUSEHOLD			
Age			
20–23	.356	.263	-.094
	(.204)	(.237)	(.261)
36–44	-.850*	-.526*	.325
	(.215)	(.153)	(.263)
Older husband	-.357	.245*	.603*
	(.288)	(.122)	(.279)
Extended household	-.194	.498*	.692*
	(.108)	(.122)	(.152)
EDUCATION			
Low	-.095	.396*	.490
	(.208)	(.202)	(.299)
High	.135	.257	.121
	(.228)	(.196)	(.307)
High-status occupation	.013	.055	.042
	(.239)	(.172)	(.271)
Large landowner	.050	-.088	-.138
	(.156)	(.170)	(.193)
Agricultural assets	-.016	-.125*	-.109*
	(.024)	(.018)	(.026)
COMMUNITY			
Health center in village	.055	-.129	-.184
	(.274)	(.393)	(.239)
Remoteness	-.206*	-.043	.163*
	(.072)	(.041)	(.076)
Agricultural productivity	.0005	.0006	.0001
	(.0003)	(.0003)	(.0003)
Jute production	.125	.265*	.139
	(.183)	(.125)	(.181)

(continued)

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Variable	Sterilized vs. Not Sterilized	Lost to Follow-up vs. Not Sterilized	Follow-up vs. Sterilized
INTERACTIONS			
Age 20–23 by extended household	-.559*	.262	.821*
	(.257)	(.216)	(.292)
Age 20–23 by remoteness	-.063	-.000	.063
	(.107)	(.094)	(.118)
Age 36–44 by health center	-.337	.314	-.023
	(.411)	(.408)	(.382)
High education by health center	-.129	.449	.577
	(.297)	(.381)	(.406)

Notes: $^*p < .05$ (two-tailed test). Chi-square = 210.7, df = 34. Number of couples = 2,933. Numbers in parentheses are standard errors. See notes to Table 2 for definitions of the variables.

consistent with the simulations presented in Table 6. An alternative interpretation is that successful villages in one sector (agriculture) are likely to be successful adopters of technology from other sectors (e.g., family planning), in part because of communication between workers in the different sectors.

The effects of village involvement in jute production are weaker. Residents of villages with at least one household engaged in this activity are relatively unlikely to use a method, especially the pill. (See Table 7.) Jute production involves tedious hand labor, and it is common to hire outside the family to get this job done. In such contexts the motivation to limit births, and to delay births early in the reproductive life course, may be low.

Assessment

To examine how completely our model accounts for variation in patterns of contraceptive choice, we compare it with a more comprehensive but less elegant specification of village differences. Our standard of comparison is a multilevel model with individual and household predictors, as above, but with villages represented as a series of 50 dummy variables. The benchmark model also includes interactions of the village dummies with age and education. This model ac-

**TABLE 4.   SIMULATED PROPORTIONS OF NONSTERILIZED COUPLES USING A TEMPORARY METHOD OF CONTRACEP-
TION, BY PRESENCE OF A HEALTH CENTER IN THE VILLAGE**

Health center present?	None	Pill	IUD	Injection
A. CONDITIONAL ON WIFE'S AGE				
No				
Age 20–23	.577	.258	.079	.085
Age 24–35	.473	.279	.146	.102
Age 36–44	.578	.222	.133	.067
Yes				
Age 20–23	.553	.399	.013	.035
Age 24–35	.475	.456	.026	.043
Age 36–44	.374	.565	.044	.018
B. CONDITIONAL ON EDUCATION OF COUPLE				
No				
< 4 years	.569	.248	.109	.075
4 years	.516	.266	.123	.095
> 4 years	.542	.190	.214	.054
Yes				
< 4 years	.509	.439	.027	.026
4 years	.463	.473	.031	.033
> 4 years	.428	.515	.011	.047

knowledges community variation in patterns of contraceptive choice but makes no attempt to specify its sources. The model lacks theoretical power regarding community variables, but provides an approximate upper limit suggesting how well we might do if all the important community variables were specified.

The pseudo-R^2 (Maddala 1983:40) associated with this model equals .332, compared with a pseudo-R^2 of .146 for the model shown in Table 2. The individual, household, and village variables included in the quantitative analysis thus account for a substantial portion of variation between villages in contraceptive choice, but by no means have we developed a complete explanation. Important sources of community variation have not yet been tapped.

SOCIAL NETWORKS

Many descriptions of community and contraceptive behavior focus on structural and normative influences that are external to individuals and couples. Proposed mechanisms of impact revolve around altered sets of opportunities and con-

straints on contraceptive decision making. The standard description of community effects does not coincide very well with the way most of us experience membership in a community: key missing ingredients are interpersonal influence and the importance of conversation (Watkins 1991).

Five focus group interviews conducted in early 1991 provide insight on conversations about contraceptive methods in Nang Rong and on the role of social networks in determining who participates in these conversations. We selected four study villages on the basis of prior knowledge of the contraceptive methods popular in each (pill, IUD, injection, and vasectomy) and we interviewed women or men age 35 to 44 about factors affecting the choice of one method versus another. We conducted a fifth focus group interview with headmen from eight villages to determine their awareness of patterns of contraceptive use, and to inquire about possible reasons for such patterns. The transcripts are a particularly valuable source of information about social networks in the Nang Rong villages, and about the importance of village boundaries for the discussion of contraception.

TABLE 5. SIMULATED PROPORTIONS OF NONSTERILIZED COUPLES USING A TEMPORARY METHOD OF CONTRACEPTION, BY REMOTENESS OF THE VILLAGE

Obstacles to Travel	None	Pill	IUD	Injection
0	.562	.247	.081	.111
1	.538	.271	.105	.087
2	.506	.292	.134	.069
3	.468	.310	.168	.054
4	.427	.324	.207	.043

TABLE 6. SIMULATED PROPORTIONS OF NONSTERILIZED COUPLES USING A TEMPORARY METHOD OF CONTRACEPTION, BY PRODUCTIVITY OF RICE

Productivity of Rice, kg/rai	None	Pill	IUD	Injection
200	.508	.331	.081	.081
300	.522	.292	.104	.083
400	.530	.254	.133	.083
500	.532	.219	.167	.083
600	.528	.186	.206	.081

TABLE 7. SIMULATED PROPORTIONS OF NONSTERILIZED COUPLES USING A TEMPORARY METHOD OF CONTRACEPTION, BY INVOLVEMENT IN JUTE PRODUCTION

Involvement in Jute Production	None	Pill	IUD	Injection
No	.493	.309	.112	.087
Yes	.564	.230	.128	.077

Family planning is an everyday topic of conversation in Nang Rong, especially among women, and it comes up naturally in a variety of settings. In the description of one headman:

> At the rice mill, [women] meet each other and ask, "How many children do you have now? I have two children. . . . And you haven't gotten sterilized yet? No, I haven't. I'm on the pill." They will talk like this. They will ask about children. It will go on like this.

Women discuss children, family size, and contraceptive methods in the course of their everyday activities—when they go to fetch water, work in the fields, look after cattle or water buffalo, or have their children weighed by a visiting health worker. Women do not readily discuss family planning with men, however, other than their husbands. When one woman was asked whether she felt embarrassment when talking about family planning, she replied, "No, I'm not shy. When I talk to men, I am shy." And when one man was asked whether men share information about their vasectomy with women, he stated, "If she is brave enough to ask, we will be brave enough to tell."

Women say they discuss family planning with their neighbors and friends, especially those of similar age and life stage. The boundaries of age and generation, however, are relatively permeable to discussion, especially in contrast to boundaries of class and status. Before the focus group interviews, we tried to identify types of women whose opinions might be influential in the village: the headman's wife, the head of the housewives' group, teachers and their wives, and women living in relatively well-off households. By virtue of their background and current status, these women might have more ready access to new knowledge about birth control. We also thought they would share this information with other villagers, and asked explicitly about this possibility.

Our qualitative data point to the importance of interpersonal interaction and the sharing of information, and are consistent with the notion that more advantaged couples may have special access to information. Interestingly, however, especially in light of debates about the interpretation of class differences in quantitative analyses (e.g., Cleland and Wilson 1987), our qualitative data do not show that more advantaged couples are viewed by others as models to emulate. Nor do they indicate much sharing of information across class boundaries or village boundaries.

Indeed, village boundaries largely coincide with the boundaries of social networks. Villagers have many opportunities to meet women from other villages—at the market, at religious festivals, and on public transportation. Yet villagers do not always strike up conversations with people they do not know; when they do so, they keep to safe topics such as crops, working in the field, or rice yields. Occasionally, however, social networks incorporate more than one village. Conversations about birth control are more likely with women from nearby villages. Residents of neighboring villages engage in a variety of common activities, in part because they may share a school or a temple. Many ties of kinship and friendship link such villages.

The focus group interviews produce a picture of social networks made up of women of similar background and life stage, largely confined to the village. Within these networks, contraception is a normal and frequent topic of conversation. Indeed, focus group participants, when asked, could name without hesitation the most popular method in the village. To put this fact into perspective, how many Americans could name the most popular contraceptive method in their neighborhood or among their friends or coworkers? Focus group participants could also name the first users of contraception in their village and could agree on a date for the first acceptance. They did this without the hesitation that characterizes attempts to retrieve unimportant memories.

DEVELOPING AN INTEGRATED PICTURE

To develop an explanation of community and contraceptive choice in Nang Rong, we must answer three questions about patterns in the data. First, how can we explain why each village tends to have a most popular method? Second, why is one particular method the most popular? And third, why do patterns vary so much from village to village? In this concluding section, we draw on both the quantitative and the qualitative data to develop tentative answers.

We hypothesize that method dominance within villages reflects a process of knowledge acquisition which emphasizes the experiences of others in the village. Methods of contraception can be regarded as technologies that compete for "markets." Usually the more widely a technology is adopted, the more attractive it becomes to others. Arthur (1988) describes several potential sources for this effect, including one that is of particular interest here: "informational increasing returns." In this case, the more couples adopt a method and use it successfully, the more is known about that method; the more is known about a method, the more likely it is that other couples will adopt it.

This dynamic helps us to understand a finding in the qualitative data that is otherwise very puzzling. Initially we expected that highly publicized negative experiences would explain avoidance of particular methods. We asked about this explicitly in the focus group interviews. If someone within a village experienced a problem with a method, it was clear that this information would quickly be shared within the village. The focus group materials, however, provide no examples of couples avoiding a particular method because of the side effects or failures experienced by earlier users. Apparently, even if the news is not entirely positive, couples prefer methods about which a great deal is known already.

The boundaries of social networks help us to understand how villages can vary so much in their choice of method. Shared knowledge about family planning and contraceptive methods is largely village-based. The qualitative data create a picture of an interlocking network of individuals who are similar and already know one another quite well. This social structure facilitates communication within itself, but impedes the flow of information from the outside (Rogers 1979:155). Thus it is not surprising that even neighboring villages vary so widely. Interlocking networks are a conservative force, encouraging conformity to established norms and behavior.

In view of the dynamic we have hypothesized, which emphasizes the importance of cumulating experience, the choices made by early contraceptive users in the village may have strongly influenced village history. It is unlikely that the initial choice of method was entirely random, although large stochastic elements may exist. We hypothesize that the particular method chosen is related to the historical time at which the choice was made. The earlier the initial choice, the fewer the options. The earlier the initial choice, the greater the likelihood of opting for the IUD rather than the pill, and the greater the likelihood of opting for either IUD or pill rather than injection. In the quantitative analysis, for example, we found a positive effect of the productivity of rice on IUD use. It may be that the first couples to practice family planning did so in high- rather than low-productivity villages and thus were more likely to choose the IUD than other methods. This line of argument is speculative and assumes that 1984 levels of productivity reflect prior levels, but the idea that contextual differences might be *historical* in origin is worth pursuing.

Of course, the most popular method used currently in the village may not be the one chosen by early users. We have no information about possible shifts in method preference in the 51 villages covered by the quantitative data, but one of the focus group villages provides evidence for such a shift. In this village, the doctor who initially advised villagers to take the pill (the first method used there) subsequently made injection available and encouraged its use. Injection is now the most popular method in that village. This example illustrates how health workers may exert an influence within a network of information flow. We see the importance of the influential outside actor, who was also a link to the family planning program. Other potential conduits of new information were underutilized, at least in the villages represented in the focus group materials. We have already commented on the surprising *lack* of influence by headmen's wives, teachers and teachers' wives, and women from well-off households. Focus group participants also said that returning migrants did not represent a source of new information about contraceptive methods.

Previous research on community and contraceptive choice tended to focus on easily measured aspects of community, such as access. Our results show that family plan-

ning accessibility and other structural characteristics are important, but they also suggest the importance of other, less easily measured variables, especially those related to the operation of social networks. Here the evidence is indirect rather than direct: we observe the "footprints" of social networks but so far have not measured their characteristics or incorporated them into the quantitative analysis.

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