

## THE DYNAMICS OF CONTRACEPTIVE ADOPTION IN BOHOL, PHILIPPINES: 1976-1978

Josefina F. Reynes

### ABSTRACT

This paper looks at the determinants of the dynamic shift from natural to regulated fertility in a predominantly rural, Catholic population in the Philippines. Between surveys in 1976 and 1978, one-half of the childbearing couples in the province of Bohol were exposed to an intensified family planning program. Over one-third of the couples who had never used a contraceptive method changed their contraceptive status during this 30-month interval. In order to determine what factors were associated with this shift, a framework was constructed in which adoption is viewed as the outcome of motivation and costs of fertility regulation. Two dimensions of costs were identified; namely, community-level/ecological factors, and interpersonal/personalized aspect of reproductive practice.

The predictors of the transition from natural to controlled fertility among childbearing couples in the province are successfully identified. The study also highlighted the significance of interpersonal/personalized elements of fertility regulation as an important "cost" for couples' reproductive behavior. Overall, the findings have useful implications in guiding the direction of future efforts to slow down population growth.

### INTRODUCTION

Fertility declines which have occurred in developing societies during the last two decades have typically been attributed either to modernization (Donaldson and Keeley, 1988; World Bank, 1984; Caldwell, 1982; Inkeles and Smith, 1974) or the introduction of family planning programs (Anderson and Cleland, 1984; Boulier, 1984; Kelly and Cutright, 1983; Tsui and Bogue, 1978). An increasing number of scholars, however, have come to acknowledge a joint impact of both of these elements on reproductive practices (Faour, forthcoming; Maukin and Lapham, 1984; Ness et al., 1983; Faruquee, 1979). While considerable scientific attention has been devoted to the determinants of fertility decline in various parts of the world, only a few systematic efforts have dealt with the micro-level shift to regulated fertility (Choe and Park, forthcoming; Phillips and Simmons, 1988; Cleland and Hobcraft, 1985; Tsui, 1985; McClelland, 1980). This transition from natural to controlled reproductive behavior among the childbearing segment of a population is most crucial for countries aiming to slow down population growth. The occurrence of this shift basically signals the acceptability of behavior related to

family size limitation. Considering the radicalness of this innovation among traditional populations, it becomes imperative to find out the influences surrounding this process of articulation of attitudinal change into actual practice. Although the implications of this process for stimulating sustained low fertility levels is obvious, the determinants of this shift among childbearing couples have remained largely unexplored to date.

This paper focuses on the predictors associated with the transition from natural to regulated fertility among couples in an island province in the Philippines. In particular, it examines the impact of certain aspects of a family planning intervention program as predictors of changes in contraceptive behavior.

### BACKGROUND

The Philippine family planning program was established in 1970 (Concepcion, 1985). By the mid-1970s, sufficient exposure to the concept of "birth control" and to the idea of family size limitation should have enabled the majority of childbearing

couples to come to some decision about the applicability of this concept to their personal lives. Indeed, as of 1973, 28 per cent of these couples had tried to use contraceptive techniques (Laing and Phillips, 1974). The nationwide program was carried out through the various government health clinics situated in town centers throughout the country. It took the form of contraceptives (mostly pills and condoms) made available within these clinics at minimal cost. Marketing of condoms in retail stores was also started.

Between 1976 and 1980, one-half of the island province of Bohol represented the site of the Maternal and Child Health-Based Family Planning Project (Population Council, 1980). Bohol is a predominantly rural province situated in the central Philippines, 350 miles south of Manila. In 1975, it had a population of about 800,000 people, with one city of 50,000. The population is ethnically homogenous (Boholano/Cebuano) and mostly Roman Catholic. Roads, transportation and communication services in the province are generally inadequate and, as Williamson (1979) observed, the overall economic picture between early 1976 until 1978 was one of stagnation, accompanied by gradually rising expectations.

The intervention project consisted of the establishment of family planning outlets and clinics in remote rural villages and outer islands where trained paramedical staff (midwives) provided maternal and child care as well as family planning services to an identified number of childbearing couples within a specified territory. The staff dispensed free contraceptive supplies (pills, condoms, spermicides) and provided other family planning methods (e.g., IUD insertions) with a technical back-up of physicians who carried out sterilization procedures. A majority of traditional birth attendants (*hilots*) in the intervention area were also given training in hygienic delivery methods and were encouraged to convince couples about family limitation. In contrast, the other half of the island (designated as the Non-Project area) did not receive similar inputs.

Presumably, in the mid-1970s, the contraceptive methods (mainly pills and condoms) and traditional techniques of avoiding pregnancy (withdrawal, ab-

stinence and calendar rhythm) had been tried by many childbearing couples throughout the country (Hackenberg and Magalit, 1985; Herrin and Pulum, 1981). Fairly widespread adoption was also apparent within Bohol. A survey undertaken in 1976 shows that 44 percent of the couples reported themselves as having tried at least one contraceptive method. Then between 1976 and 1978, 143 couples (comprising 34 percent of the never users in 1976) became contraceptors. As a result, over three-fifths or 63 percent of the couples could be classified as ever users as of 1978. It is thus of some interest to investigate whether this increase in contraceptive practice came about as a result of the family planning intervention program in the province or simply because the childbearing couples became aware of the need to prevent unwanted births by themselves during this period.

## THE MODEL

The shift to controlled fertility among childbearing couples remains susceptible to various causes. Socio-economic advances as well as community-level factors and the availability of family planning resources in an area make a difference in couples' decisions (Casterline, 1985). The adoption of certain innovations such as the use of contraception may also be the result of individual characteristics of both spouses (Goldscheider, 1971). In this paper, we hope to identify particular determinants of this process among Boholanos which could then be generalized to the rural population of the country. For this purpose, we employ a comprehensive approach, namely, the Easterlin Synthesis Framework, to organize better the factors associated with this change.

In its original inception, the Easterlin model posited that contraceptive practice is the result of the motivation to limit (stop or space) births and the costs of fertility regulation to the couples (Easterlin, 1975; Easterlin, 1978). That these two explanatory variables presumably mediate between the various demographic, socio-economic and socio-cultural characteristics of couples and their contraceptive behavior, is the major hypothesis of this study. Another hypothesis pertains to the varying importance of the types of costs of fertility regulation on the couples' shifting practices.

Table 1 presents the variables used in this study. The dependent variable, ADOPTION is conceived as the process whereby those women who had never used contraception as of 1976 did so during the interval and had become users by 1978. This dynamic behavior largely reflects a radical change in the calculus of childbearing among couples who had previously been natural and fatalistic in this regard.

Motivation (MOTIV) is operationalized here as the balance between demand and supply of children as reflected in the couples' desire to stop, space, or limit births.

Fawcett (1978) found that Filipino parents experience and perceive changing satisfaction and costs derived from having additional children. This occurs when their tastes, preferences and lifestyles

are altered through changing socio-economic characteristics (Guilkey, 1988; Hendershot, 1975). While urban parents emphasize the psychological and emotional benefits derived from interacting with children, rural couples stress economic and practical benefits, such as old-age security. Bulatao (1978) has also observed that the values and disvalues attached to sons and daughters, or older children and younger children are dissimilar. Hence the demand for children is driven by a dynamic perception of the benefits and costs of childbearing.

While very few couples believe that it is good to have an only child (Bulatao, 1978), many might be persuaded of the advantages of having more than one, but at less frequent intervals. Therefore, couples may belong to either of two groups: those who already have more children than their desired

Table 1.--Variables Used in the Analysis

Variable	Description	Values
Dependent Variable		
ADOPTION	Applicable only to those who had never used a method as of 1976 and had done so by 1978; derived from the two variables: motivation to limit births and costs of fertility regulation to the couple.	Dichotomy: 1=adopted 0=did not adopt.
Predictors		
MOTIV	Reflects the directional change in the couples intentions between 1976 and 1978; this item is based on a crosstabulation of the three types of intentions (stopping, spacing, want soon) in 1976 and 1978.	Dichotomy: High=towards stopping/spacing births; Low=if want births soon.
FPSITE	Indicates the location of households <u>vis-a-vis</u> the intervention program in the province.	Dichotomy: 1=Project 2=Non-Proj.
DISTANCE	The approximate distance (in km.) between the respondents' residence and the family planning clinic/outlet.	Categories: 1=Central 2= <3 kms. 3= >3 kms.

Table 1.--Variables Used in the Analysis

Variable	Description	Values
SERVICES	Whether couples were visited concerning family planning by three types of individuals: Project midwives, outreach workers from the national program, and traditional midwives ( <i>hilots</i> ).	Dichotomy: Hi= if reported having received some; Lo= otherwise.
COSTNDEX	Social, psychological and other costs related to the use of any family planning method.	Hi= if reported costs Low = otherwise
AGE	The woman's chronological age at the time of interview	Categories: (in yrs.) 1=15-29 2=30-39 3=40-49.
PARITY	The number of surviving children.	Categories: 1= 0-1 child 2= 2-4 children 3= 5+ children
RESID	Place of residence	Dichotomy: 1= Urban 0= Rural.
R-EDUC	Level of education attained. Those with vocational and college training are included in the HS+ category.	Categories: 1= Prim 1-4 2= Elem 5-7 3= HS+.
H-EDUC		
RELIG76	The extent of religiosity among the women as measured in terms of frequency of participation in church activities in 1976.	Categories: 1= Secular 2= Moderate 3= Devout.

number, and those still building their family. Whereas the former are bound to want to stop childbearing altogether, the latter may opt to postpone other births. For instance, those who already have four children may want to stop having more,

while those who have only one child may choose to wait three or four years before their next birth. For both types of couples, family planning is a recourse. Highly motivated couples will presumably use contraceptive techniques to carry out reproductive

goals while the not-so highly motivated may do so sporadically. Furthermore, some couples use family planning methods for other reasons, such as to protect the health of mother or child.

Among the sample couples, 72 percent fell into the high MOTIV category while the remaining 28 percent either wanted another child soon, remained undecided or perceived themselves to be no longer fecund. This measure is based upon the directional change in the couples' intentions during the interval (i.e., on a crosstabulation of desire to stop, space, or have another birth soon in 1976 and again in 1978).

Four elements operationalizing costs are shown in Table 1, namely: FPSITE, DISTANCE, SERVICES and COSTINDEX. These variables may be categorized into two types of costs using Hermalin's (1983) classification scheme as monetary and non-monetary costs. While FPSITE and DISTANCE belong to the monetary aspect, SERVICES and COSTINDEX represent the non-monetary dimension. We discuss each of these variables separately.

FPSITE, an exogenous variable, assumes a dimension of cost of fertility regulation with respect to the availability of family planning supplies and services (Tsui, et al., 1981; Brackett, 1980). This factor had been known to account for much of contraceptive practice in some societies (Monteith, 1987; Rodriguez, 1978). Here, it has been dichotomized into the Project and Non-Project areas. More than half (55 percent) the sample couples were found in the Project area, whereas 45 percent of the sample only had recourse to the resources of clinics in the town centers.

DISTANCE is another exogenous explanatory variable. This has been operationalized as the approximate distance from the couples' residence to the clinic/outlet in their area. The couples' residential location thus reflects their accessibility to the nearest family planning outlet. Supposedly, contraceptive practice occurs more among couples living near a source of family planning service (Jones, 1984; Rodriguez, 1977). In 1976, less than a fifth of the couples were within a kilometer from a clinic; the majority were located in remote villages requiring over an hour's travel by foot or on outer islands requiring at least an hour's boat ride.

SERVICES is an endogenous variable which reflects the intentional efforts of clinic personnel in both Project and Non-Project areas of the province to serve all identified childbearing families. As in other settings, this element is highly predictive of contraceptive use (Simmons, 1986). In the context of this study, SERVICES includes the straightforward informational, instructional and motivational efforts concerning family size limitation and the use of contraceptive methods in 1976 and in 1978. Similarly accounted for are the persuasive messages transmitted by the family planning providers for the use of IUD and sterilization procedures among their clients during home visits or in consultations at the clinics (for other purpose) as well as at informal gatherings in the community. The providers were instructed to encourage clients to try out new methods (pills or condoms) and to provide the latter with samples of these supplies (also resupply), but they had no way of knowing whether these supplies were properly used. The effort by the clinic personnel to distribute supplies to the study's respondents thus constitutes the basis for our measure of SERVICES. As such, both users and non-users alike had the same opportunity of receiving as well as using/trying these methods. Similar services were also available from the clinic personnel of the Non-Project side of the province (although these were mostly town-center based), so the respondents from that area have the same frame of reference.

Because couples who are likely to seek family planning services on their own volition are also those likely to receive follow up visits from the providers, measures of SERVICES may be subject to circularity. In order to avoid this problem, we purposely measure the extent of outreach from one direction only: that which the clients reported to have received from the family planning personnel. We do not consider those which the couples solicited for themselves. Therefore, SERVICES is a measure of the family planning outreach extended to the childbearing population by the clinic providers and hilots; these efforts were not procured by the clients voluntarily. As of 1978, only about a quarter of the couples admitted to having never been reached by the clinic providers (in both sides of the province). In contrast, 76 percent or the majority of them had been so visited.

COSTINDEX is the Subjective Cost Index; it tries to capture all subjective considerations which are sources of major concern among potential contraceptors and contraceptors alike, including some notions or impressions relative to the use or non-use of a method or technique. Barcelona (1985) has referred to "negative beliefs" in contraceptive practice. In this study, these are grouped as the personal costs of contraception. The responses of contraceptors on their dissatisfaction with a method they had used or are using, along with the reasons for nonuse among potential users, serve as the source of the COSTINDEX. These personal obstacles to the use of a contraceptive method are of three types: social, psychological and other costs.

The first type of subjective cost included in the index is social. Lately, some attention has been given to the spousal agreement in the use of contraception in traditional societies (Jejeebhoy and Kulkarin, forthcoming; Joesef et al., 1988). In this analysis, social costs pertain to the conflict of attitudes between spouses. Specifically, this type of cost is derived from the question asked of women respondents: "What do you think of family planning?" and "What does your husband think of family planning?" The responses range from strongly approve to strongly disapprove, but these are coded as a dichotomy in this study. Where there is a discrepant attitude between the spouses towards family size limitation and the practice of contraception, the social cost is high; when the attitudes do not clash, social cost is low.

Another dimension of subjective costs is psychological. Included here are such concepts as "negative perception" (Schuler, 1986), "negative rumor" (Porter, 1985), and the inhibitive influences identified by Schearer (1982) and Scrimshaw (1976) as the great stumbling blocks to the use of a family planning method. Both perceived and actual hazards surrounding contraceptive practice are included here. The reasons given for non-use as well as of the dissatisfaction of family planning methods by both non-adopters and adopters serve as the source of information. The users did not give any reason for aversion to a method (otherwise they would not be using them), so only those not presently using contraceptive methods during the surveys provided these data. For instance, some were hesitant to openly discuss sensitive personal

issues and reluctant to submit to any physical examination; thus, the use of methods like the IUD among certain types of women became limited. Furthermore, traditional sex roles (machismo) among Filipino males generate anxiety over impaired sexual activity or damaged mental health presumably brought on by the use of certain contraceptive techniques (Teston, 1981).

Also included in the COSTINDEX are other costs; these include the residual deterrents to contraceptive practice such as ignorance (Basu, 1984) and the sheer lack of planning for the future (Wang, 1988) which couples have to overcome in order to prevent unwanted births. Although not totally innocent of strategies for family limitation, many Boholanos are hampered by illiteracy and a poor sense of priorities: to them, the importance of performing chores for daily subsistence may take precedence over preventing an additional birth.

Subsequently, the levels of COSTINDEX are created with those having met, experienced, or felt at least one type of difficulty falling within the "high" category of the index while "low" applied to those who reported not having met any. Among the sample couples, the index has a skewed distribution inasmuch as only 18 percent reported at least one type of problem as of 1978. This percentage implies that Boholano couples were not strongly inhibited from practicing fertility control.

The impact of motivation and costs as well as of the various background factors on ADOPTION have to be systematically ascertained. However, given the delicate and highly sensitive nature of intimate decisions required in contraceptive practice, the two types of costs will presumably vary in their significance to ADOPTION. Hence, the second hypothesis of the study argues for the greater effect of the non-monetary type of costs over the monetary type.

## DATA SOURCES AND METHODOLOGY

The Bohol Project was one of four demonstration programs (the others were in Indonesia, Nigeria, and Turkey) which aimed to improve maternal and child health and regulate fertility in rural areas

of LDCs using the Taylor-Berelson model (Population Council, 1980; Taylor and Berelson, 1971). The United Nations Fund for Population Activities financed these activities, while the Population Council and World Health Organization provided technical assistance. Starting in 1975 and continuing into 1979, the Evaluation Unit of the project collected retrospective data on fertility and mortality along with current data on the occurrence of vital events, family planning, health practices and services, migration, socio-economic status, and other relevant topics (Reynes, 1985). Among the five major surveys conducted by the Unit, the 1976 Health Practices and Contraceptive Use Survey and the 1978 Health-Pregnancy Study provide the sources of information for the present paper. A cohort of 736 women were interviewed in both surveys; 414 of them had never used a method of preventing births in 1976 and are thus included in this analysis.

Bivariate associations between ADOPTION and the various background characteristics of couples are examined through Kendall's tau. This measure corrects for ties in ranked variables and is interpreted in the same manner as the Pearson  $r$ , ranging from -1 to 1 (Bialock, 1972). The analysis to test for the significance of net effects of predictors on ADOPTION was done through logistic regression equations and the use of the likelihood ratio test. This is basically a chi-square test of the improvement in overall fit to the data attributable to a particular variable (Aldrich and Nelson, 1984). All of the explanatory variables are entered into the equations as categorical variables. In the estimation, indicator variables are constructed for all but one of the categories. We utilize "effect coding" whereby the sum of the effects of all categories of each predictor is constrained to be zero (i.e., the unweighted mean of the effects is zero).

Furthermore, we transform the coefficients into predicted proportions. This is achieved by setting all variables at their mean sample values, multiplying the mean values by the estimated coefficients, summing the products and exponentiating. We then assume that the estimated equation predicts to the logit of the mean of the dependent variable. We regard the predicted proportions as illustrative of the differentials implied by the estimated equation.

All computations were done using the SPSS-X

software package (Nic, 1983) with the exception of the logistic regression estimation, which is based upon the LR program in the BMDP software package (Dixon, 1983).

## ANALYSIS AND FINDINGS

Henceforth, we only examine the 414 couples who were never users of a contraceptive method in 1976. Of this group, there were 143 who changed their practices by 1978; these are referred to as "Adopters". Our tasks in this section are three-fold. First, we examine bivariate relationships involving ADOPTION, the background characteristics of couples and the indicators of motivation and costs. Next, we assess the overall importance of the determinants of ADOPTION from the results of a multivariate logistic analysis by looking at the significance of chi-square tests from two equations. Finally, we investigate the effects of categories of predictors from the full model of ADOPTION.

A preliminary examination of the "Adopters" according to individual and household-level demographic, socio-economic and socio-cultural characteristics was undertaken so as to determine the types of couples who altered their contraceptive practices between 1976 and 1978. Because of spatial constraints, these data cannot be shown herein, but it can be noted that significant associations between ADOPTION and age, education, age at marriage, household income, acquisition of household consumer goods and religiosity were obtained.

The negative relationship of ADOPTION with age and age at marriage implies the apparent change in contraceptive behavior among younger women and those who married relatively early. ADOPTION and wife's education were related in a positive fashion thus indicating more receptivity among those with higher schooling. In contrast, to this, however, it was the lower-income groups which were more forthcoming than higher income groups between 1976 and 1978, as signified by the negative association between ADOPTION and household income. A similar relationship was observed between ownership and acquisition of various household consumer goods. In each case the data suggested that it was the couples who were deprived

of these goods and conveniences who changed their contraceptive behavior within the interval. Finally, religiosity, as measured by attendance in church-related activities, registered a negative association with ADOPTION. Evidently, the least religious women changed their childbearing practices more than those who were very religious.

Table 2 is a matrix showing the nature and significance of the bivariate associations between ADOPTION and its direct predictors. From the data, we find a highly significant positive association between ADOPTION and MOTIV.

Understandably, those who were highly desirous of limiting their births between 1976 and 1978 exhibited the highest likelihood of using a contraceptive method. A similar relationship is obvious between ADOPTION and SERVICES implying that those who were most reached by the clinic providers or who had received more family planning services during the intervening 30 months, were most likely to shift their contraceptive status.

The significant negative relationship between ADOPTION and COSTINDEX in the data demonstrates that couples who met certain difficulties were less likely to adopt a method. Meanwhile, the insignificant association between ADOPTION and

FPSITE signifies that the Adopters come from both sides of the province (not only from the intervention side). The same can be said of the insignificance of the relationship between ADOPTION and DISTANCE. Apparently the Adopters were about as likely to come from a remote rural area as from a location very near to the family planning clinic.

The data further demonstrate a positive association between MOTIV and SERVICES which is a reflection of the high motivation to limit births among couples who received family planning services from clinic providers. This is in keeping with the findings from earlier studies (Da Vanzo, 1989). MOTIV appeared not to have any association with FPSITE thereby implying that the reproductive aspirations of couples in the study cut across project boundaries within the province. It is interesting to note, however, a significant positive relationship between MOTIV and DISTANCE; this points out that the couples living very far from the family planning outlets have the highest intentions of controlling births. This finding has implications for those studying unmet needs in rural populations.

Table 2 also reveals a significant negative association between SERVICES and FPSITE. This seems to be the only indication of the enhanced family planning services in the intervention side of the

Table 2.-- Association Matrix (Kendall's Tau) between Adoption and Among Predictors

	ADOPTION	MOTIV	SERVICES	FPSITE	DISTANCE	COSTINDEX
ADOPTION	1.00	.35***	.36***	-.07	-.00	-.16***
MOTIV		1.00	.22***	-.05	.14***	-.06
SERVICES			1.00	-.10**	-.05	-.06
FPSITE				1.00	-.10*	.14
DISTANCE					1.00	-.07
COSTINDEX						1.00

\*\*\* = sig. at .001; \*\* = sig. at .01; \* = sig. at .05.



province. The moderate negative relationship between FPSITE and DISTANCE reflects the greater number of couples living in remote places in the Project side than there are in the Non-Project side. Conversely, the positive association between FPSITE and COSTNDEX registers the greater difficulties met by those in the Non-Project area over those in the intervention side.

In order to identify the real determinants of the couples changing behavior, we have to control for any spurious effect that each predictor might have on ADOPTION. We do this by examining the results of the multivariate logistic regression of ADOPTION on motivation, measures of costs of fertility regulation and background factors. Two equations using a basic model consisting of age, parity, residence, wife's and husband's education and religiosity are used for this purpose. In Equation 1, we assess the significance of the each background trait on the dependent variable, ADOPTION, and in Equation 2, the importance of each of the more direct predictors.

Table 3 shows that for Equation 1, only two background demographic traits have a significant influence on ADOPTION: the wife's age and her parity. These two should therefore be considered part of the basic model, so that substantially strong direct effects of these variables on ADOPTION will inevitably show up despite the presence of other factors.

The results for Equation 2 in the table, however, only support the strong effect of age, but not of parity. Presumably, the influence of parity has been mediated by MOTIV. Most noticeable here are the highly significant effects of three predictors: MOTIV, SERVICES and COSTNDEX. The two exogenous indicators of costs, FPSITE and DISTANCE, registered no influence on ADOPTION whatsoever.

The above findings clearly demonstrate that the framework used in this study has successfully identified the factors which matter most to ADOPTION. Evidently, among Boholano couples, in addition to the strong impact of age, MOTIV and some measures of costs of fertility regulation (namely SERVICES and COSTNDEX) determine ADOPTION. The importance of the latter two aspects of costs emphasizes the higher significance of interper-

Table 3.--Significance of Chi-Square Tests from logistic Regressions of ADOPTION on Background Factors and Predictors

	Equation 1	Equation 2
<b>Background Factors:</b>		
Age	***	***
Parity	**	n.s.
Residence	n.s.	n.s.
Wife's Education	n.s.	n.s.
Husband's Education	n.s.	n.s.
Wife's Religiosity	n.s.	n.s.
Household Type	n.s.	-
HH Composition	n.s.	-
Age at Marriage	n.s.	-
Age Difference	n.s.	-
Household Income	n.s.	-
Landholding Size	n.s.	-
Bought Consumer Goods	n.s.	-
Have Modern Services	n.s.	-
Econ Perception	n.s.	-
Migration Status	n.s.	-
Wife's Work Status	n.s.	-
Employment	n.s.	-
<b>Predictors:</b>		
Motivation	-	***
FPSite	-	n.s.
Distance	-	n.s.
Services	-	***
Costndex	-	***
N Cases	410	410

a) Equation 1 = includes age, parity, residence, wife's and husband's education, and wife's religiosity as the basic model, plus one characteristic each time.

b) Equation 2 = adds one of the predictor variables to the basic model each time.

\*\*\* = sig. at < .001 level.

sonal and/or client-staff contact as well as of personally sensitive dimensions in contraceptive practice. In other words, these factors prevailed over the ecological and community-level influences of FPSITE and DISTANCE, thereby lending some support to the second hypothesis of this paper. This also agrees with the findings of some studies, which hint at the unimportance of external availability of contraceptive methods and their price for the couples' actual reproductive behavior (Schwartz, et al., forthcoming).

Next, we inspect the effects of categories of predictors of ADOPTION by examining the coefficients and predicted proportions for each category of determinant from the result of the full model (when all the predictors are simultaneously entered into the equation). The coefficients and predicted proportions of the variables entered in the full model are presented in Table 4.

Those with high motivation registered the most influence on ADOPTION, gauging from the absolute .38 differential in the predicted probabilities between the two categories. This finding implies that those who had the most positive attitudes towards stopping, spacing or limiting their number of births had the highest likelihood of adopting a method between 1976 and 1978. The second important determinant of ADOPTION relates to whether the respondents were reached by the family planning program. Here, a .29 differential exists in the predicted probabilities between those with "high" and "low" SERVICES. If there is a need for proof of the impact of the family planning efforts of providers on the couples' practices, this result provides it. The greater likelihood of adoption if the couples received family planning services (on both sides of the province) also stresses the importance of interpersonal contact with providers.

Table 4 also reflects the significant deterrents to ADOPTION. There is a .26 differential in the predicted probabilities between the categories of the COSTINDEX. Evidently, the couples who reported having met some personal difficulties on the use of contraceptive methods were the least likely to adopt contraception between 1976 and 1978. The significant effect of age on ADOPTION lies in the fact that the wives at the extreme ages

varied in their likelihood of adopting a method. The .43 differential between the predicted probabilities of the youngest and the oldest age groups signified that the younger set remained more likely to adopt contraception than the older couples. The emphasis on spacing births is clearly the driving force for the young couples.

Overall, if the determinants of ADOPTION are ranked according to their effects, MOTIV occupies the top place followed by SERVICES then COSTINDEX, plus the unanticipated unmediated strong influence of AGE. Finally, the insignificance of the other predictors is clearly delineated by the almost total absence of any differentials in the predicted proportions of their respective categories.

## SUMMARY AND CONCLUSION

The identification of factors associated with the changes in contraceptive practices of childbearing couples in developing countries is most crucial in understanding the elements which could bring about and sustain a fertility decline in these societies. In this study, the shift from natural to regulated fertility among 414 couples in an island province in the Philippines is investigated. Between surveys in 1976 and 1978, intensified family planning services were introduced by trained midwives to remote areas on one side of the province. The impact of these services and of the individual characteristics of couples at that time on changing contraceptive status were then examined.

For this purpose, a framework was employed to organize the predictors of the shift into a paradigm whereby ADOPTION is the outcome of motivation and costs of fertility regulation among childbearing couples. In such a formulation, the background traits of couples have only indirect impact on the respondents' changing behavior; their effects will be mediated by motivation (MOTIV) and costs. While MOTIV is conceptualized as the balance between demand and supply of children as reflected in their desire to stop, limit or space births, two sets of factors represented costs in the model. One set of costs reflected community-level and ecological accessibility of family planning supplies

Table 4. -- Summary Result of Logistic Regressions of ADOPTION on Motivation, Measures of Costs, and Background Factors<sup>@</sup>

	Significance	Coefficient	$\hat{p}$		Significance	Coefficient	$\hat{p}$
Motiv	***			Parity	n.s.		
Low		-.962	.14	0-1		.070	.39
High		.962	.52	2-4		-.272	.31
Services	***			5+		.202	.42
Low		-.765	.14	Wife's Educ.	n.s.		
High		.765	.43	Prim 1-4		-.109	.32
Distance	n.s.			Elem 5-7		-.041	.33
Central		.625	.51	Hi school+		.150	.33
Near		-.390	.27	Husband's Educ	n.s.		
Far		-.235	.30	Prim 1-4		-.171	.31
Costindex	**			Elem 5-7		.120	.38
Low		.694	.40	Hi school+		.051	.36
High		-.694	.14	Wife's Religiosity	n.s.		
FPsite	n.s.			Secular		.034	.35
Project		.028	.36	Moderate		.041	.35
Non-Project		-.028	.34	Devout		-.075	.33
Residence	n.s.			Constant		-.952	
Rural		-.017	.35	Overall Mean			.35
Urban		.017	.36	Log Likelihood		-195.793	
Age	***			N of Cases		410	
18-29		1.091	.57				
30-39		-.039	.30				
40-49		-1.052	.14				

<sup>@</sup> = based on the full model (where age, parity, residence, wife's education and religiosity, and husband's education comprised the basic model.)

$\hat{p}$  = predicted proportion.

\*\*\* = sig. at .001; \*\* = sig. at .01 level.

and services (also known as monetary costs in the literature), namely FPSITE and DISTANCE. The other set attempted to capture the personalized (non monetary) aspects of the program. Two contrasting variables were used for the latter purpose: SERVICES and COSTNDEX. SERVICES reflects the extent of interpersonal contact, persuasion or service extended by clinic staff in both areas of the province to the couples. On the other hand, COSTNDEX represents all the subjective and highly personal deterrents to contraceptive use among couples. Basically this index includes social, psychological and other types of costs of fertility regulation to couples.

The major hypothesis of the study centers on the use of the synthesis framework to organize the predictors. Another hypothesis specifically pinpoints the type of cost with most relevance to ADOPTION: namely, that the interpersonal and client-oriented type of costs (non-monetary) have greater importance than the community-level and ecological elements (monetary).

There were 143 couples (35 percent) in the sample who altered their practices between 1976 and 1978. These "Adopters" were identified in the bivariate analysis as young, early-married couples with relatively more schooling but lower income, deprived of desirable consumer goods and modern conveniences such as television or electricity, and with a tendency not to be devout Catholics.

In both bivariate and multivariate logistic procedures, MOTIV, SERVICES and COSTNDEX showed very significant relationships with ADOPTION. However, in both investigations, FPSITE and DISTANCE registered no significant association or impact on ADOPTION. These findings proved the utility of the model used in predicting the determinants of the dynamic change in couples' childbearing behavior. Age remained directly associated with ADOPTION in the multivariate analysis but the other background factors dropped out. Given this finding and the fact that only one type of cost was important, the major hypothesis of the study remains only partially proven. This modest support can perhaps be explained by the inadequacy of the predictors to capture all the variation in the changing contraceptive practice among couples.

Moreover, the greater importance of the interpersonal and personalized dimensions (i.e., SERVICES and COSTNDEX) as compared to the external factors or monetary considerations of the project was clearly demonstrated. Such results therefore gave a strong support to the second hypothesis. Evidently, the childbearing couples in Bohol were most likely to adopt a method when they were convinced of the necessity to limit, stop or space births, when they receive personalized encouragement from the clinic staff to do so, and when the perceived costs were reduced.

However, before these results can be generalized to the country's rural population, or to any developing society, certain limitations of the study have to be considered. First, despite of the spillover of intangible effects of the intervention program from the Project area to the other side of the province, the few cases in the analysis did not allow for a separate analysis by area. Hence, the likelihood that ADOPTION is stimulated in the same fashion in both areas was not determined here. This points to the need for studies with large samples to allow more comprehensive investigations of this relationship in distinct experimental and control areas. Second, had a more refined operationalization of SERVICES been used, differentiation of motivational efforts by the staff from their services of providing clients with contraceptive supplies would have been possible. Unfortunately, this type of measure was not available to us. Thus, while the framework proved an appropriate tool for this type of analysis, i.e., that of predicting the factors determining the couples' shift to controlled fertility, future studies could concentrate on coming up with better indicators for motivation and costs as effective intervening variables. Third, an interval of 30 months may be too short a period to expect dramatic socio-economic changes to occur in the community, given that the various background categories did not reflect as significant an impact as in other countries. (However, it is encouraging to note that it was the younger women who were most likely to become adopters. To a certain extent these are precisely the women whom the Philippine program is in most need of reaching, since the general tendency in the past has been for these sorts of younger women to go on bearing children at a very rapid pace, with little heed for the necessity of proper birth spacing.) Additionally, there is an implied homogeneity of the population

being studied which might be difficult to replicate elsewhere. The findings may only apply to areas having characteristics similar to Bohol, i.e., a non-urban and highly homogenous population. Finally, a possible strategy for modifying couples' contraceptive practices can be drawn from the findings here: family planning programs should deploy the types of personnel who can reach the couples at their level. This means workers of both sexes who are confident, adequately prepared and technically well-versed to inspire and encourage the use of contraceptive methods.

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