

AN INTEGRATED MODEL OF FERTILITY: A MULTIVARIATE ANALYSIS OF FERTILITY DIFFERENTIALS IN COLOMBIA

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Résumé — En combinant certains aspects du modèle "social structural" de Davis et Blake et du modèle "interactionnel" de Stycos on a développé un modèle de "route intégrée" et on a essayé ce modèle avec les données de sondage provenant de quatre cités de la Colombie. Dans le modèle, une variable démographique (l'âge) et deux variables institutionnelles (type de mariage et l'éducation) sont traitées comme étant "prédéterminées". La variable dépendante, la fécondité courante (déterminée par la grossesse des douze mois précédents), est supposée être affectée non seulement par les variables prédéterminées mais aussi par deux variables intermédiaires indispensables (la mortalité juvénile et les matériels contraceptifs utilisés. Trois variables d'information (la discussion de l'épouse sur la dimension de la famille, l'attitude vis-à-vis les matériels contraceptifs et la connaissance des matériels contraceptifs) sont stipulées avoir des effets directs sur les matériels contraceptifs déjà utilisés, qui, à leur tour, affectent la fécondité courante. La validité du modèle est, en général, soutenue par les données empiriques lorsqu'une variable antécédente, l'expérience précédente en fécondité (déterminée par le nombre d'enfants en vie avant l'année précédente), est convenablement contrôlée. Les résultats suggèrent que les variables institutionnelles sont des conditions nécessaires mais pas suffisantes pour expliquer les différentiels en fécondité. Les changements dans le domaine d'information sont aussi utiles et importants.

Abstract — An integrated path model, combining aspects of Davis and Blake's "social structural" model and Stycos' "interactional" model, is developed and empirically tested with survey data obtained from four cities in Colombia. In the model, one demographic variable (age) and two institutional variables (type of marriage and education) are treated as "predetermined." The dependent variable, current fertility (measured by pregnancy in the previous 12 months), is hypothesized to be affected not only by the predetermined variables, but also by two key intermediate variables (child mortality and contraceptives ever used). Three informational variables (spouse discussion about family size, attitude toward contraceptives, and knowledge about contraceptives) are postulated to have direct effects on contraceptives ever used that, in turn, affect current fertility. The validity of the model is generally supported by the empirical data when an antecedent variable, previous fertility experience (measured by number of living children before the previous year), is properly controlled. The results suggest that institutional variables are necessary, but not sufficient, conditions for explaining fertility differentials. Changes in the informational sphere are also relevant and important.

Key Words — current fertility, parity, institutional, informational, intermediate variables, Colombia

Colombia is experiencing one of the most rapid rates of population growth in the world. At the present average annual increase of 3.2 per cent it will take only 22 years for

the population to double its size (The Population Reference Bureau, 1976). In order to alter this trend, many research and action programmes have been initiated since 1965 (see Mendoza-Hoyos, 1968, an excellent summary and review). The results of these activities have not only demonstrated the extent of the problem of rapid population growth in Colombia, but have also revealed the need for basic research on fertility. The purpose of this study is to develop a multivariate model of fertility and to examine some of the factors that influence the current levels of fertility among married women in Colombia.

Theoretical Framework

One of the best known typologies in the comparative sociology of human fertility is the classification of "Intermediate Variables" by Kingsley Davis and Judith Blake (1956). In attempting to account for fertility differentials between the developed and less developed countries of the world, Davis and Blake specify 11 factors as intermediate variables¹ through which all the sociological and economic factors that influenced individual levels of fertility must operate. They further identify the manner in which different institutional patterns, such as family structure and property inheritance systems, act through these intermediate variables to enhance or depress societal fertility.

J. M. Stycos (1955) has suggested another type of scheme for the analysis of individual fertility, one using an interactional frame of reference. The nuclear family is viewed as a planning unit with the husband and wife acting as decision makers. To engage in effective family planning, the couple must agree on desired family size, be equally informed about contraception, and have similar attitudes toward the use of contraception. This concurrence, Stycos suggests, most often occurs in an equalitarian family structure. "Equal status" between husband and wife may encourage better communication and more successful family planning and could achieve lower fertility, given the availability of contraceptives.

In a critical analysis of Davis and Blake's analytic framework, Tien (1968) points out that only three of the eleven intermediate variables are directly linked to specific institutional patterns — age at marriage, amount of reproductive period spent after or between unions, and voluntary abstinence. He further suggests that institutional change is not a sufficient condition for fertility reduction. Changes in the informational sphere may also be relevant and important. Tien contends that demographic, informational, institutional and some key intermediate variables should be considered simultaneously in analyzing fertility differentials.

This paper describes a micro model in which different aspects of Davis and Blake's "social structural" model and Stycos' "interactional" model were integrated. In the development of micro-fertility models, researchers have often been constrained by the selection of relevant variables and the availability of appropriate data. Furthermore, a proper analytical focus and sensible measures of fertility must be adopted before a valid model can be constructed. For instance, Namboodiri (1972) has criticized the use of completed family size as a dependent variable in the economic analysis of fertility. He suggests that family-growth dynamics should be analyzed as a sequential process because each birth is influenced by a different set of circumstances (Namboodiri, 1974). By using discriminant-function analysis, Namboodiri studies expected fertility of a sample of American women at specific parities. His findings are that the combined discriminatory power of socio-economic variables is greater at higher parities than at lower ones, while the opposite is true of demographic variables.

The problem of selecting relevant variables is well illustrated in a study of fertility in

India by Loebner and Driver (1973), who included 22 variables in the first path model and 25 in the second. Their path analysis indicates that only five variables have a statistically significant effect on the number of children ever born: duration of marriage, spouse's cohort, caste, spouse's age at marriage, and number of head's siblings.

Following the notion that family-growth dynamics is a sequential process, the present study analyzes current fertility (measured by whether a woman was pregnant in the previous year) by parities; that is, by controlling for previous fertility experience. To avoid having to experiment with a large number of items, the selection of relevant variables in our model was guided by different aspects of Davis and Blake's social structural typology and Stycos' interactional framework. The method of modelling used is path analysis.

Data

The data in this study were collected by members of the International Population Program of Cornell University in the summer of 1971. An areal random sample was drawn from four Colombian cities: Tunja, Popayan, Armero, and Barrancabermeja. After making a complete count of the total number of houses per block in each city, the blocks were identified on a map. The sample was restricted primarily to lower- and middle-income families by limiting sampling to lower- and middle- income neighbourhoods. Women to be interviewed were selected by "cluster sampling." A quota of 1,600 female respondents was set (400 per city) and a total of 1,476 interviews were obtained. The shortfall of 124 cases was primarily due to absences, illnesses, or refusals. Only currently married women aged 15 to 39 were included in the study. The final sample size was 1,251.

A path model of current fertility is presented in Figure 1, and Table 1 contains definitions of variables used in the model and their measurement. In this multi-stage model, one demographic variable (age) and two institutional variables (type of marriage and education) are treated as predetermined variables, that is, variables for which determinants are not examined in the model (see Duncan, 1969). The three successive stages considered are (a) three informational variables (spouse discussion about family size, attitude toward use of contraceptives, and knowledge about contraceptives), (b) two

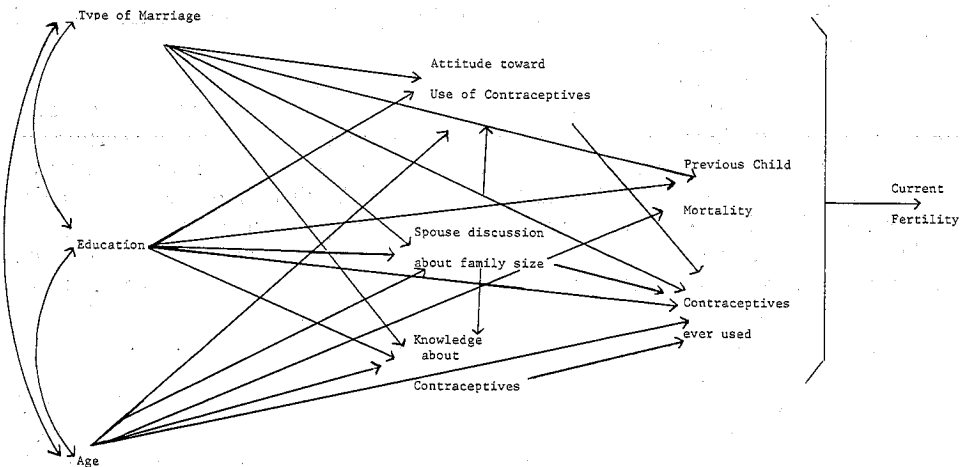


FIGURE 1 GENERAL MODEL OF CURRENT FERTILITY FOR WOMEN AT DIFFERENT PARITIES

TABLE 1. VARIABLES USED IN THE ANALYSIS AND THEIR MEASUREMENT

	Variable	Abbreviation	Measurement
(1)	Type of Marriage	TM	1= legal marriage, 0= consensual union
(2)	Education	ED	1= never studied; 2= 1-2 of primary school; 3= 3-4 grades; 4= primary complete; 5= 1-2 secondary; 6= 3-5 secondary; 7= secondary complete; 8= some university; 9= university complete
(3)	Age	AGE	Range from 15 to 39
(4)	Spouse Discussion about family size	SDFS	1= yes; 0= no
(5)	Attitude toward use of contraceptives	ATUC	1= positive; 0= negative
(6)	Knowledge about contraceptives	KAC	Number of contraceptive methods known
(7)	Previous child mortality	PCM	Number of live births died before previous year
(8)	Contraceptives ever used	CEU	1= have used at least one method 0= have never used any method
(9)	Current fertility	CF	1= had pregnancy in the last year 0= had no pregnancy in the previous year
(10)	Previous fertility experience	PFE	Number of living children before previous year

intermediate variables (previous child mortality and contraceptives ever used), and (c) current fertility. Each of these stages is assumed to depend on the antecedent stages and on the pre-determined variables.

Theoretically, since some informational variables (such as attitude toward use of contraceptives and knowledge about contraceptives) may be affected by contraceptives ever used or by cumulative fertility, the postulated recursive model could involve a certain degree of simultaneous equation bias. In order to minimize this bias, the model will be estimated separately for women who had different previous fertility experience and the dependent variable is limited to pregnancy in the last year only (i.e., current fertility). A positive effect of attitude toward the use of contraceptives on contraceptives ever used and a negative effect on current fertility are hypothesized to exist only for the group of women who had no children before (zero-parity group). Furthermore, the results from this study will be compared with those obtained from simultaneous equation models (Gregory, *et al.*, 1972; Gupta, 1975).

The selection and ordering of the variables are based on time sequence, theoretical assumptions, and earlier research. The rationale for the treatment of each variable may be briefly reviewed. First, type of marriage (legal marriage *vs.* consensual union) is assumed to have asymmetrical positive effects on the informational variables because legally married women generally have higher social status and a more equal relationship

with their husbands than women in consensual unions (Stycos, 1955). Therefore, legally married women may be more likely to discuss desired family size with their husbands, to express favourable attitudes toward the use of contraceptives, and to have adequate knowledge about contraceptives. Type of marriage is further postulated to have an asymmetrical positive effect on contraceptives ever used that would, in turn, reduce current fertility.

On the other hand, perhaps because of status insecurity, consensually mated women are more likely than legally married women to be selfsupporting; they also tend to experience shorter duration of exposure to the risk of pregnancy than women in legal marriage. Because of these differences, it may be hypothesized that legally married women would have higher fertility as a result of their lower participation in the labour force and longer duration of marriage (Stycos and Back, 1964). In this study, attempts were made to reconcile these two opposing hypotheses.

The second institutional variable is the level of education. Education is associated with access to special knowledge and techniques that enable educated women to use contraceptives effectively. It is assumed that a higher level of education has positive effects on knowledge about contraceptives, spouse discussion about family size, attitude toward use of contraceptives, and contraceptives ever used which would, in turn, have negative effects on current fertility. It is also hypothesized that a higher educational level tends to have a direct negative effect on fertility performance.

The demographic variable, age of the respondent, is postulated to have a positive effect on previous fertility experience (as measured by number of living children before previous year) because of the cumulative nature of the latter variable. However, since as a woman ages, her fecundity level tends to decrease, it is reasonable to hypothesize that age is negatively related to current fertility.

The three informational variables (SDFS, ATUC and KAC) are assumed to be affected not only by the predetermined variables but also by previous fertility experience. Particularly, women's knowledge about contraceptives and attitude toward the use of contraceptives are likely to be influenced by their previous experience of childbearing; thus, it was expected that the higher the level of previous fertility experience, the greater would be the knowledge about contraceptive methods and the more favourable the attitude toward the use of contraceptives. It is therefore particularly important to control previous fertility experience when the relationships between the informational variables and current fertility are examined.²

As stated earlier, the higher educated and legally married woman tends to be closer to equality with her husband in terms of family decision making than the woman who is less educated and in a consensual union. The equal status between husband and wife would encourage better communication and more effective discussion about family size. Through the exchange of information and mutual reinforcement, the wife may be encouraged to acquire adequate knowledge about contraceptives and to develop a favourable attitude toward contraception.

It is, however, questionable that spouse discussion about family size would necessarily lead to a lower level of current fertility. On the one hand, discussion about family size may result from the desire to have an additional child. On the other hand, desired family size may also be a factor in a decision to control fertility. There may be some intervening variables, such as previous fertility experience, operating here. It seems probable that the couple's previous fertility experience and the number of children they want to have may determine whether their discussion about family size would tend to increase or decrease current fertility.

One of the intermediate variables in Davis and Blake's typology is fetal mortality from involuntary causes. Since no reliable information on fetal mortality was collected in the survey, previous child mortality (measured by the number of live births that had died before the previous year) is used in the model as a proxy for this intermediate variable. Previous child mortality is hypothesized to be negatively affected by type of marriage and level of education, because higher educated and legally married women have higher socio-economic status and, therefore, tend to have better maternal and child care than lower educated and consensually mated women. It has frequently been postulated that the death of a child induces a desire to have additional children, to replace the lost child and safeguard the family from the consequences of possible future loss. Such a desire might increase the probability of an additional birth; that is, higher previous child mortality might lead to higher current fertility.

Use or non-use of contraception is one of the most effective intermediate variables in influencing current fertility. In our model, because of limitations in the data, "contraceptives ever used" has been used as the measure for this variable. A better measure would be "use or non-use of contraceptives just prior to the last pregnancy". One of the shortcomings of "contraceptives ever used" is the confusion of causal sequence. For instance, the earlier experience of contraceptive use for a high-parity woman may create a positive attitude toward contraception and/or increase her knowledge about contraceptives. The sequence postulated in the model may be reversed because the time limit of contraceptive use is not specified. However, the path analysis does not rule out the possibility of reciprocal interaction between variables (Wright, 1960). Furthermore, information on contraceptives ever used is relatively easy to obtain and this variable can be a powerful predictor of current fertility.

Current fertility, measured by whether a respondent was pregnant in the previous year, is the dependent variable in the model. The hypothesis to be tested was that current fertility is affected not only by the predetermined variables but also by all the antecedent variables.

Method of Analysis

Because previous high fertility experience has a positive influence on the formation of favourable attitudes toward use of contraceptives and may also influence the decision about whether to have an additional birth or to control fertility, we estimated the models for the different sub-groups based on previous fertility experience. Since the characteristics of women having no previous fertility would be different from those of women having children, zero-parity women are treated as a distinct sub-group. The mean value of desired family size for the entire sample was 3.19 children. Women with children were divided into two sub-groups — parity 1 to 3 and parity 4+.

The path diagram shown in Figure 1 was applied to the three parity groups. Estimation of path coefficients was made separately for each group. The analysis was designed to specify not only the direct effects of each independent variable on current fertility but also their indirect effects. Indirect paths were estimated by multiplying the coefficients attached to the connecting paths. The significant direct and indirect effects of the independent variables are presented in Table 2. All significantly connected paths and the values of indirect effects from the independent variables to current fertility are shown in Table 3.

Findings

The results of the analysis may be summarized as follows:

TABLE 2 DIRECT AND INDIRECT EFFECTS OF SIGNIFICANT VARIABLES ON CURRENT FERTILITY BY PREVIOUS FERTILITY EXPERIENCE

Variable	Previous Fertility Experience		
	0	1 - 3	4+
(1) Type of Marriage	.031	-.050	-.067
Direct	N.S.	-.057	-.059
Indirect	.031	.007	-.008
(2) Education	.025	-.110	-.161
Direct	N.S.	-.109	-.099
Indirect	.025	-.001	-.062
(3) Age	-.460	-.178	-.146
Direct	-.349	-.166	-.155
Indirect	-.011	-.012	.009
(4) Spouse Discussion About Family Size	.177	.031	-.063
Direct	.177	.048	-.048
Indirect	N.S.	-.017	-.015
(5) Attitude Toward Use of Contraceptives	-.114	N.A.	N.A.
Direct	-.114	N.A.	N.A.
Indirect	N.S.	N.A.	N.A.
(6) Knowledge About Contraceptives	N.S.	-.051	-.098
Direct	N.S.	N.S.	-.063
Indirect	N.S.	-.050	-.035
(7) Previous Child Mortality	N.S.	-.055	.062
Direct	N.S.	-.055	.062
Indirect	N.A.	N.A.	N.A.
(8) Contraceptives Ever Used	N.S.	-.107	-.068
Direct	N.S.	-.107	-.068
Indirect	N.A.	N.A.	N.A.
Sample Size	182	603	466

N.S. = No significant effect

N.A. = Not appropriate, excluded from analysis

(1) The total impact of different independent variables on current fertility varied from one parity group to another. Their effects differ not only in magnitude but also in sign (Table 2). Similarly, the indirect paths are only rarely the same for all three parity groups (Table 3). These findings suggest that previous fertility experience does, indeed, operate as an intervening variable between various independent variables and current fertility.

TABLE 3 VALUES OF INDIRECT PATHS FROM SIGNIFICANT VARIABLES TO CURRENT FERTILITY BY PREVIOUS FERTILITY EXPERIENCE

Variable and Path	Previous Fertility Experience		
	0	1 - 3	4+
(1) Type of Marriage	.031	.007	-.008
1. TM→ATUC→CF	.010	-	-
2. TM→PCM→CF	-	.005	-.008
3. TM→SDFS→CF	.021	.003	-
4. TM→SDFS→KAC→CEU→CF	-	-.001	-
(2) Education	.025	-.001	-.062
1. ED→ATUC→CF	-.017	-	-
2. ED→SDFS→CF	.042	.010	-.008
3. ED→SDFS→CEU→CF	-	-.001	-
4. ED→SDFS→KAC→CEU→CF	-	-.002	-.001
5. ED→KAC→CEU→CF	-	-.018	-.014
6. ED→KAC→CF	-	-	-.024
7. ED→PCM→CF	-	.010	-.015
(3) Age	-.011	-.012	.009
1. Age→ATUC→CF	.011	-	-
2. Age→SDFS→CF	-.022	-	.004
3. Age→SDFS→KAC→CF	-	-	.001
4. Age→KAC→CF	-	-	-.004
5. Age→KAC→CEU→CF	-	-.002	-.002
6. Age→PCM→CF	-	-.010	.010
(4) Spouse Discussion About Family Size	-	-.017	-.015
1. SDFS→CEU→CF	-	-.005	-
2. SDFS→KAC→CEU→CF	-	-.012	-.005
3. SDFS→KAC→CF	-	-	-.010
(6) Knowledge About Contraceptives			
1. KAC→CEU→CF	-	-.050	-.035

"-" sign indicates no significant path existing.

(2) In the zero-parity group, type of marriage is positively related to current fertility; that is, women with no previous fertility experience who are legally married tend to have a higher probability of conception than zero-parity women in consensual unions. The higher social status of the former group may make them less concerned with fertility control for the first birth. However, legally married women in the other two parity groups (1-3 and 4+) are less likely to conceive than consensually mated women with the same number of children. This finding supports the notion that legally married women tend to possess more knowledge of, to have more favourable attitudes toward, and to employ more effective methods of contraception. These advantages enable legally married women to space or to control childbearing more effectively, after initial family formation, than women in consensual unions.

(3) Spouse discussion about family size is positively related to current fertility in the

zero-parity and parity 1-3 groups, but negatively related in the 4+ group. This finding suggests that before the couples reach their desired family size (3.19 in the sample), spouse discussion about family size tends to be concerned with increased fertility. In the high-parity group (4+), discussion is more likely to centre around fertility control.

(4) Attitude toward use of contraceptives shows a negative effect on current fertility in the zero-parity group. This result indicates that a more favourable attitude toward the use of contraceptives would depress current fertility.

(5) Mean values of child mortality are .07 for the zero-parity group, .30 for the 1-3 parity group, and .67 for the high parity group (see tables in appendix). Previous child mortality shows a significant positive effect on current fertility in the high-parity group (4+). This finding implies that a higher incidence of child mortality among higher parity women would result in an increase in current fertility that could offset previous child mortality. The incidence of child mortality in the other groups is so low that this relationship is obscured.

Table 2 also indicates that the independent variables that exercise significant direct effects on current fertility differ for each parity group. By knowing previous fertility experience, separate linear equations of estimation may be obtained for each parity group. Based on the present sample, these equations are:

For zero-parity group:

$$CF_1 = 1.22 - .03 AGE + .22 SDFS - .12 ATUC; R^2 = 0.17$$

(.006) (.085) (.070)

For parity 1-3 group:

$$CF_2 = .89 - .01 AGE - .03 ED - .11 CEU - .04 PCM - .07 TM + .06 SDFS;$$

(.003) (.013) (.043) (.028) (.052) (.048)

$$R^2 = 0.07$$

For parity 4+ group:

$$CF_3 = 1.03 - .03 ED - .01 AGE - .07 CEU + .03 PCM - .07 TM - .01 KAC$$

(.015) (.004) (.052) (.020) (.056) (.009)

$$- .05 SDFS; R^2 = 0.08$$

(.043)

These equations summarize the direct effects from the path analyses discussed earlier, presenting the unstandardized regression coefficients. The standard error of each coefficient is indicated in parentheses. It is immediately clear that different variables enter into the final estimated equations when the different parity groups are compared. Education is not significant in the zero-parity group, probably because most of these women are at a life cycle stage when they are thinking about having their first child. This interpretation is reinforced by the positive effect of spouse discussion about family size. As suggested earlier, discussion in the zero-parity group tends to be focused on the initiation of the family formation process. The difference in the coefficients for spouse discussion about family size between the zero parity and highest parity groups is significant at the .01 level (using a standard two-tailed *t* test). The difference between parity group 1-3 and the highest parity group for spouse discussion is also significant at the .01 level. Previous child mortality is a significantly different between parity group 1-3 and the highest parity group at the .05 level. None of the other differences in variables common to the different equations is statistically significant. The proportion of variance explained (R^2) is indicated after each equation. The lower R^2 for the two higher parity groups may be

the result of the exclusion of the variable attitude toward the use of contraceptives in these parities. This suggests that it may be desirable in future analyses to employ a simultaneous equations approach allowing for simultaneous causal effects.

Discussion

In this section the sociological and policy implications of the various findings will be systematically discussed.

The relationship between type of marriage (legal marriage *vs.* consensual union) and current fertility varies with previous fertility experience. A positive relationship was found in the zero-parity group while negative correlations were observed in the other two groups. The negative relationship between type of marriage and current fertility in higher parity groups suggest that, for legally married women, marital status would not necessarily encourage high fertility since they would be likely to have more knowledge about contraceptives and use contraceptives more effectively than consensually mated women. As a country such as Colombia becomes more modernized, the proportion of legally married couples can be expected to increase. Concerns about higher fertility among legally married women, as suggested by Stycos and Back (1964), however, are not warranted. As long as contraceptive information and means are available to the public, change in marital status may have little effect on future fertility increase.

Another structural variable, level of education, shows a relatively strong negative effect on current fertility (except for the zero-parity group). This variable has not only a direct negative relationship with current fertility but also an indirect one through its influence on the informational variables. This implies that educational development may be one of the necessary and crucial mechanisms for lowering fertility in less developed countries.

The negative relationship between age and current fertility persists over all parity groups. Certainly a society can stipulate a legal age for marriage. Delay of marriage until a later age either by legal means or social norms could have a strong impact on reducing current fertility.

Lowering child mortality, particularly infant mortality, has frequently been considered as a precondition for a rapid decline in fertility. In this study, since most respondents had experienced very little child mortality, this variable was related to current fertility only for the high-parity group (4+). The implication of this finding may be that the effect of this variable on fertility reduction is small in an area of relatively low child mortality. This low effect does not deny, however, the significance of previous low child mortality as a necessary condition for lower fertility.

The negative effects of the informational variables on current fertility were primarily through their influence on contraceptives ever used. This finding indicates that, for the effective implementation of a family-planning programme, changes in individual attitudes toward contraception and the extension of knowledge about contraceptives are clearly needed. On methodological note is worth making here. An attitudinal variable should not be used to explain or predict a cumulative behavioural variable (such as number of children ever born), because the attitude expressed may be a result of previous behaviour. There must be an appropriate time lag between attitude expressed and behaviour observed.

It is worth noting that the results for the effects of education and previous child mortality are generally similar to results obtained with aggregate data on nations using a simultaneous equations approach (Gregory, *et al.*, 1972; Gupta, 1975). We interpret this

as confirmation of the validity of our results from a single equation model. However, the control of previous fertility experience demonstrates that aggregate relationships can be expected to vary within subgroups of the population. Further research at a low level of aggregation is necessary to clearly specify the pattern of causal linkages.

Summary

In this study, an integrated path model, combining aspects of Davis and Blake's "social structural" model and Stycos's "interactional" model, has been developed and empirically tested with survey data obtained in four cities in Colombia. The findings suggest that the institutional variables (type of marriage and education level) are necessary but not sufficient conditions for explaining fertility differentials. Differences in the informational variables, such as knowledge of contraceptives, attitudes toward use of contraceptives, and spouse discussion about family size, are also relevant and important. The use of contraceptives is the key intermediate variable directly affecting current fertility and a low previous child mortality seems to be a necessary precondition for lower current fertility. The study seems to confirm the notion that family growth dynamics is a sequential process; therefore, in analyzing current fertility, previous fertility experience should be controlled.

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Footnotes

- 1 The "intermediate variables" are as follows:

"Intercourse Variables"

(1) age of entry into sexual union, (2) permanent celibacy, (3) amount of reproductive period spent after or between unions, (4) voluntary abstinence, (5) involuntary abstinence, (6) coital frequency.

"Conception Variables"

(7) fecundity or infecundity as affected by involuntary causes, (8) fecundity or infecundity as affected by voluntary causes, (9) use or non-use of contraception.

"Gestation Variables"

(10) fetal mortality from involuntary causes, (11) fetal mortality from voluntary causes.

- 2 For women who had children prior to the previous year, their expressed attitudes toward contraceptives at the time of the survey may be affected by their previous fertility experience and may not have causal effects on current fertility. We therefore include this attitudinal variable in the model for zero-parity women only.

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Appendix

TABLE A1. MEANS, STANDARD DEVIATIONS AND ZERO-ORDER CORRELATIONS OF THE VARIABLES IN THE MODEL OF CURRENT FERTILITY FOR WOMEN WHO HAD NO CHILDREN PRIOR TO PREVIOUS YEAR (N=182)

Variables	(1) TM	(2) Ed	(3) Age	(4) SDFS	(5) ATUC	(6) KAC	(7) PCM	(8) CEU	(9) CF
(1) Type of Marriage	-								
(2) Education	.365	-							
(3) Age	.111	.067	-						
(4) Spouse Discussion About Family Size	.189	.269	-.090	-					
(5) Attitude Toward Use of Contracep- tives	-.044	.115	-.110	.084	-				
(6) Knowledge About Contraceptives	.067	.470	.040	.292	.188	-			
(7) Previous Child Mortality	-.169	-.161	.231	.011	.005	-.021	-		
(8) Contraceptives Ever Used	.048	.203	-.088	.213	.246	.408	.053	-	
(9) Current Fertility	.035	-.041	-.352	.200	-.061	.001	-.045	.093	-
Mean	.852	4.64	22.5	.807	.654	4.60	.066	.352	.626
Standard Deviation	.356	1.83	5.52	.395	.477	2.83	.388	.479	.485

TABLE A2. MEANS, STANDARD DEVIATIONS AND ZERO-ORDER CORRELATIONS OF THE VARIABLES IN THE MODEL OF CURRENT FERTILITY FOR WOMEN WHO HAD ONE TO THREE CHILDREN PRIOR TO PREVIOUS YEAR (N=603)

Variables	(1) TM	(2) Ed	(3) Age	(4) SDFS	(5) ATUC*	(6) KAC	(7) PCM	(8) CEU	(9) CF
(1) Type of Marriage	-								
(2) Education	.387	-							
(3) Age	.065	-.067							
(4) Spouse Discussion About Family Size	.145	.229	-.034	-					
(5) Attitude Toward Use of Contracep- tives*									
(6) Knowledge About Contraceptives	.223	.424	.018	.327		-			
(7) Previous Child Mortality	-.154	-.226	.188	-.111		-.123	-		
(8) Contraceptives Ever Used	.165	.356	-.021	.233		.543	-.075	-	
(9) Current Fertility	-.113	-.135	.172	.002		-.099	-.050	-.136	-
Mean	.789	4.00	27.3	.779		5.25	.299	.642	.375
Standard Deviation	.408	1.72	7.2	.416		2.79	.718	.480	.485

*Attitude Toward Use of Contraceptives is excluded in the analysis of this parity group. See text.

TABLE A3. MEANS, STANDARD DEVIATIONS AND ZERO-ORDER CORRELATIONS OF THE VARIABLES IN THE MODEL OF CURRENT FERTILITY FOR WOMEN WHO HAD FOUR OR MORE CHILDREN PRIOR TO PREVIOUS YEAR (N=466)

Variables	(1) TM	(2) Ed	(3) Age	(4) SDFS	(5) ATUC*	(6) KAC	(7) PCM	(8) CEU	(9) CF
(1) Type of Marriage	-								
(2) Education	.285	-							
(3) Age	.080	-.068	-						
(4) Spouse Discussion About Family Size	.065	.173	-.093	-					
(5) Attitude toward Use of Contracep- tives*									
(6) Knowledge about Contraceptives	.164	.406	.027	.215		-			
(7) Previous Child Mortality	-.187	-.287	.171	.064		-.138	-		
(8) Contraceptives Ever Used	.146	.319	.013	.167		.562	-.136	-	
(9) Current Fertility	-.134	-.179	-.140	-.084		-.174	.096	-.162	-
Mean	.831	3.45	32.7	.663		5.00	.672	.682	.273
Standard Deviation	.376	1.52	4.60	.473		2.75	1.04	.466	.446

*Attitude Toward Use of Contraceptives is excluded in the analysis of this parity group. See text.