LATIN AMERICA DEMOGRAPHIC CENTRE

Research and Training Seminar on Fertility (SIEF), using PECFAL-Rural data

EDUCATION AND CONTRACEPTION IN RURAL LATIN AMERICA

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I N D E X

ABSTRACT

In this paper we try to explain the influence of education on contraceptive knowledge using an information-flow model. Education is studied in its components of general level of education of the community as an aggregate measure, education of husband and education of the wife. Newspaper reading is introduced as a variable mediating between formal education and contraceptive knowledge. It is found that all four explicative variables used have an influence on knowledge of contraceptives, although wife's education as a predictor variable accounts for all the variance explained by husband's education. The level of education of the wider community is an important indicator of information spread. In Peru both a high level of general and of individual education is necessary to come to know contraceptives, while in Mexico and Colombia, a high level of community education by itself is a sufficient condition. In Costa Rica almost everybody has contraceptive knowledge. The information flow model serves best for Peru, thus showing its function in incipient stages of the diffusion of contraceptive knowledge.

INTRODUCTION

One of the more clearly established findings from fertility research in Latin America is the strong empirical relationship between higher levels of education and lower fertility (Miro, 1970; Carleton, 1968; Tabah, 1962; Simmons, 1971). This relationship has been found for women in all age groups (Rodríguez, 1968; Cerisola, 1963), for women in urban areas (Miro and Rath, 1966) as well as for women in rural areas (Miro and Mertens, 1969).

Despite the strength of the statistical relationship, the machanisms through which education comes to influence fertility have not been clearly specified. For this reason, interpretations of the relationship are largely speculative. Two aspects may be distinguished here:

1. Which of the Davis and Blake (1956) intervening variables are influenced by education? While in some studies major thought is given to age at marriage as having a direct relationship with education (Yaukey and Thorsen, 1972; Nevett, 1965), the more frequent argument is that education affects contraceptive knowledge and hence, the possibility of using contraceptives (Stycos, 1965) 1/. Existing findings indicate some support for the latter hypothesis. For example, education has been found to be closely related to contraceptive knowledge and to contraceptive practice in seven major Latin American cities (Elam, 1971). However, information for rural areas is less complete.

2. How does education affect intervening variables such as contraceptive knowledge? Children do not likely learn about contraceptives in school; rather, they learn reading and other skills which bring them into contact with new ideas and technologies. Later, a changing work situation may change their perspectives and the ability to read gives them all through their lives the possibility to widen their horizon. For example, Riesman (1969: 448), describes thus the effect of the ability to read in peasant society: "un labriego individual que aprendió a leer en ese tiempo

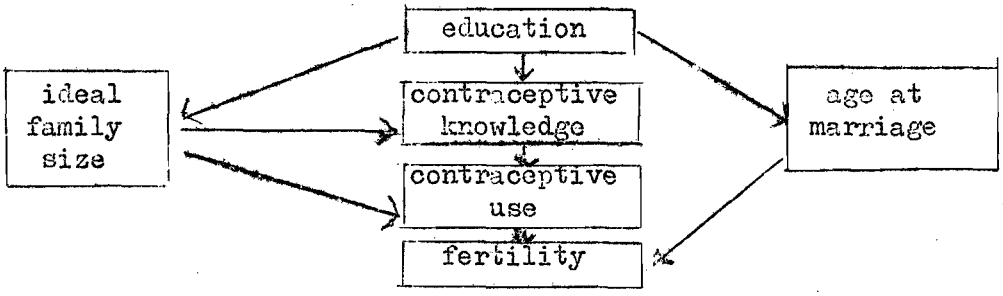
1/ A related argument is that education may have an independent influence on the desire to have small families, and that this desire in combination with contraceptive knowledge and practice influences fertility (Carleton, 1967). However, in fact the relationship between education and family size preferences is not clear: some studies even show higher family size preferences among the better educated (Pantelides, 1971) while others find in some cities a direct relationship and in others an indirect relationship (Elam, 1971). The role of family size preferences in mediating the relationship between education and fertility is obviously a complex issue. We do not consider it in this paper.

no adquirió simplemente una habilidad de escaso impacto sobre su carácter; en realidad lo que hizo fue separarse en forma decisiva del grupo primario, dirigido por la tradición".

Yet even the spread of knowledge through education need not be direct: a woman may learn and change her ideas because her husband knows more, or because the level of general knowledge of her neighborhood is high. Hence, the question of the influence of education should possibly be amplified taking into account more than the wife's education alone as is generally done (Miro and Mertens, 1969; Elam, 1971). For example, the husband's schooling may influence his reading habits and contraceptive knowledge, and the wife may learn about contraceptives through her husband. Indirect support of such a hypothesis is noted by Macisco (1969) who reports that fertility among Puerto Rican couples is influenced by the husband's schooling even when the wife's schooling is controlled. It is also possible that general levels of schooling in the surrounding community may be an important factor in the spread of contraceptive knowledge. In a community where knowledge is widespread, even illiterate women may learn about contraceptives from friends, neighbors and relatives. However, no evidence bearing directly on this possibility is available for Latin America. To date, no studies have worked at several levels, attempting to assess the independent affects of community education, husband's education and wife's education on contraceptive knowledge.

The above discussed is reflected in the simple diagram of chart A.

Chart A: Influence of education in fertility related variables.

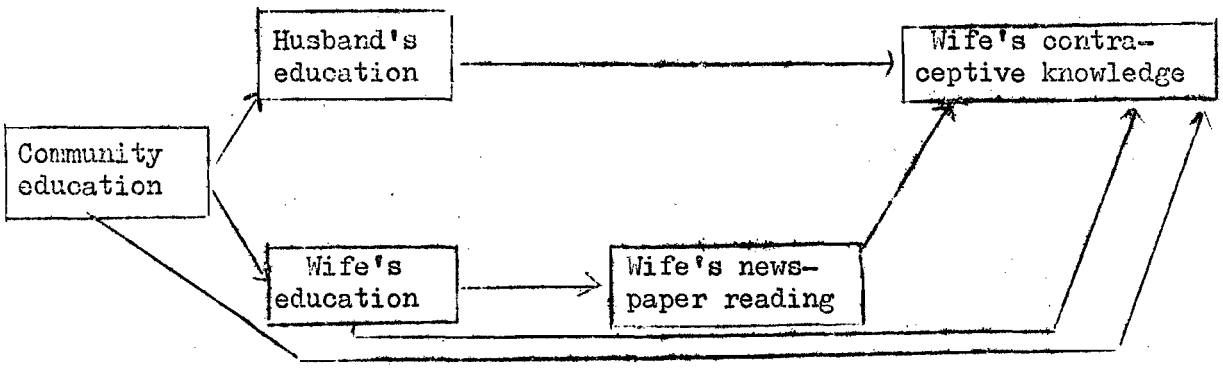


Having in mind the complicatedness of the variable education when measured on several levels, in the present paper we will limit ourselves to an exploration of its relationship with contraceptive knowledge, in order to decide the contribution which can make each of its components in the analysis of fertility related variables. The analysis focuses on an information flow model, in which education has both direct and indirect affects on contraceptive knowledge. We hypothesize that a basic determinant of any woman's contraceptive knowledge is the level of education (and the related level of contraceptive information) in the community where she lives. "Community" can be defined both broadly, to include the nation as a whole, and narrowly, to include only the locality surrounding her residence. The woman's access to information in this "community" will be dependent on her own education and reading habits, as well as on the education (and associated reading habits) of significant others in her life, such as her husband.

Chart 1 describes the relationship between selected elements in this broad hypothesis. Arrows in this model suggest that antecedent variables may influence consequent variables both directly and indirectly. For example, level of community education may influence a woman's contraceptive knowledge directly (the lower arrow in the model) or indirectly through its relationship with her husband's education (the upper arrow in the model).

Chart 1

AN INFORMATION FLOW MODEL OF CONTRACEPTIVE KNOWLEDGE



The first part of the paper describes the sample and the measures developed for our analysis. Particular attention is given here to the development of a measure of educational level for the wider community in which the respondents live. A second part of the paper describes the correlations between education of the wife, the husband and the wider community, and how these in turn are correlated with other indicators of information flow, such as newspaper reading, and with indicators of socio-economic development, such as the existence of running water and electric light in the house. A third part of the paper analyzes the relationship between some of these variables. A key issue here is whether husband's and community's educational level are independent predictors of contraceptive knowledge and practice once the wife's education has been controlled. The final section of the paper discusses the principal findings.

THE SAMPLE AND THE MEASURES

The analysis is based on data from the Program of Comparative Fertility Surveys in Latin America (PECFAL-Rural) in which representative samples fluctuating between 2 100 and 3 000 women of 15-49 years of age who lived in the rural parts or places of less than 20 000 inhabitants of Colombia, Costa Rica, Mexico and Peru were interviewed. Although the original data refer to women of all civil states, for this study we only included women in union (married or consensually) at the moment of interview.

Below the used variables will be described, and some difficulties mentioned. Their distributions will be showed in Table 1.

Community

As we did not dispose of data which referred to clearly delimited villages or communities we approximated them using the primary sampling unit (PSU) and classifying them as the 1) rural part of the PSU in which there is no city of 20 000 inhabitants or more 2) the rural part of a PSU in which such a city does exist, although it is excluded in the sample 3) the semi urban part: a village or city having between 2 500 and 20 000 inhabitants.2/ Although not identical with physical communities, they are rather homogeneous according to their demographic characteristics of population distribution and territorial unity. Thus our "community" measure should be placed between quotation marks.

The accuracy of such an aggregate measure depends on the representativeness of the samples in each "community". In order to evaluate the accuracy of regional estimates derived from the PECFAL-Rural survey, Torrealba (1973) used census data to calculate the proportion of residents with running water, radio and electricity in their homes, for each of the census regions corresponding to the PSU in the PECFAL-Rural sample. The survey itself contained questions to determine for example whether or not the respondent had running water in the home. Survey estimates of the proportion of respondents with running water in each region correlate rather well with estimates derived from the census data. For example, for running water the correlation (Pearson r) for Costa Rica is .86; for Colombia it is .52; and for Mexico it is .65. Other correlations are in general somewhat lower, but never fall below r. = .41 (Torrealba, 1973; Table 1). An independent analysis carried out for the present paper indicates that aggregate measures of education (percent with some schooling) for each "community" derived from the survey data also correlated rather well with census estimates. For example the correlation (Pearson r) in Colombia, country for which corresponding census data were readily available, was .59. The magnitude of all these correlations is surprisingly high when one considers that the census data were collected 5 to 8 years (depending on the nation) before the survey data, and that many changes may have occurred in the "communities" over this period. Moreover, even with corrections, the census and survey data do not always correspond to precisely the same geographical area. We take this as positive support for the representativeness of the survey and for the accuracy of the aggregate estimates of education based on it.

Education

The measures of education of husband and wife were constructed from the question:
"which year (grade level) of schooling (of education) did you finish?"
(¿Qué año (curso, grado, nivel) de escuela (educación) terminó usted?)

The measure was divided in three categories (see Table 1): without schooling, primary school incompleted, primary school completed or more.

2/ Because of sample characteristics, in Costa Rica another procedure had to be followed to get comparable results.

Given the distribution of years of schooling in the rural areas, more specification did not seem fruitful. For regression and path analysis the exact number of years of schooling was used.

Educational level of the wider community

An aggregate measure of the general level of education in the communities studied was used based on the education of the women who lived there at the moment of the survey. The weighted mean of the percentages of women 1) without schooling; 2) with primary school not completed, 3) with primary school completed or more was calculated and all women, in a given community were assigned this mean, as a measure of education in their immediate surroundings. This procedure makes possible an analysis with other data measured on the individual level.

In analysis based on means, such as regression and path analysis, the data were used as described, while for the purpose of presenting distributions of "community" education, the districts in all four national samples were pooled and ordered by the height of the mean. The districts were then divided into quartiles such that the higher 25 percent were coded as "very high" on community education, the next 25 percent were coded as "rather high" and so on. Distributions of respondents in these quartiles are shown by nation in Table I.

Mass Communication Means

Newspaper reading was used as the measure of mass communication. The question was asked:
"Do you read newspapers" and in the affirmative case "How often?"
(¿Lee usted diarios (periódicos)? ¿Cuántas veces? (¿Cada cuánto tiempo los lee usted?)

To use the variable in correlations etc., it was coded in two categories: never reads, cannot read; reads sometimes or daily.

Contraceptive knowledge

Various measures of contraceptive knowledge exist in the questionnaire, two of which are general questions:
"Do you know whether a man and his wife can do anything to prevent pregnancies (not to have children)?" (¿Sabe usted si hay cosas que un hombre y su esposa (mujer) pueden hacer para no tener hijos (no encargar) (evitar los embarazos?)

Another is:
"There are things which are very distinct from an abortion which a doctor or a nurse can teach you in order not to have more children and thus have them when you want them. Did you hear of such things?" (Hay cosas muy diferentes al aborto que un médico o una enfermera pueden enseñarle para no tener hijos y así tenerlos cuando quiera. ¿Ha oído usted de estas cosas?)

The information obtained from these questions seemed rather vague to us; moreover, it might include the mere knowledge of things which in reality do not serve to avoid pregnancies.

Another series of questions provides information on each scientific contraceptive method separately and refer to whether the interviewer recognizes or mentions the method. In the present analysis contraceptive knowledge is defined as the recognition of at least one contraceptive method named by the interviewer: thus the measure is rather ample. (See Ponce, 1973 for more details on contraceptive knowledge in the surveys).

INSERT TABLE I ABOUT HERE

Relationships between predictor variables

Education of husband and education of wife

The level of education of husband and of wife are distinct measures as Table II shows. Approximately 45 percent of the couples in each country have the same level of education, while roughly 55 percent have different levels (Table II). In Peru and Colombia, the husband has generally more education than his wife; in Peru this is clearly so.

INSERT TABLE II ABOUT HERE

Individual and community educational level

As was to be supposed, educational differences exist between women within communities. Thus, not all persons in a district with a low level of education necessarily have little or no schooling. Table III shows that within each quartile category of community education, there are women with no schooling, women with primary incomplete and women with primary or more complete. This accentuates the possibility of considering community and individual education as separate variables.

INSERT TABLE III ABOUT HERE

Education and the Mass Media

As stated in the introduction, education is considered in this paper as forming part of an information flow complex in which newspaper reading also is included. The newspaper spreads information to people of all age

groups and as such may have a more direct impact on adult behaviour in specific fields than the more general and socializing reading in school. To show the interrelations between the information flow variables a correlation matrix for all four countries together, is given in Table IV. All these variables naturally are related with other measures of integration in the modern community, such as the existence of running water and/or electric light in the respondent's house. The wife's education correlates (Pearson r.) at .65 with her husband's education, at .56 with her own newspaper reading; and at .40 with both "community" education and "community" services (proportion of homes with light and/or running water).

INSERT TABLE IV ABOUT HERE

ANALYSIS

In the following section an attempt is made to assess the independent contributions which each of the predictor variables makes to an understanding of contraceptive knowledge. Three variables at a time are used: two predictor variables and the dependent variable. The principal question under investigation is whether community education, husband's education and wife's newspaper reading (taken separately) each has an independent influence beyond wife's education in predicting contraceptive knowledge.

In all four nations, the wife's education and the husband's education both independently contribute to the prediction of contraceptive knowledge (Table V). For example, in Colombia, when husband and wife both have no schooling, only 49 percent of the wives know a contraceptive method. Where the husband has no schooling but the wife has primary or more complete, 68 percent of the wives know a method. Where the wife has no schooling but the husband has primary or more complete, 63 percent of the wives know a method. Where both husband and wife have primary complete, 91 percent of the wives know a method.

INSERT TABLE V ABOUT HERE

At this same level of analysis newspaper reading also shows a contribution to contraceptive knowledge which is independent of wife's education (Table V). The relationship of contraceptive knowledge to wife's education and to her newspaper reading, however, is somewhat distinct in Peru. Among Peruvian women who do not read newspapers, wife's education has only a weak relationship to contraceptive knowledge. However, among Peruvian women who do read newspapers, wife's education is strongly related to contraceptive knowledge. In the other countries, where the general level of contraceptive knowledge is much higher, newspaper reading is less important as a factor mediating the influence of schooling on contraceptive knowledge. This finding may be considered as support for the hypothesis that newspaper reading brings

people into contact with ways of thinking other than their own. Newspaper reading would appear to be more important in Peru because contraceptive knowledge is low in the rural communities where our respondents live. In such a setting, a woman has a better chance of learning about contraceptives if she receives "news" from the outside.

Community education and wife's own education also are independently related to contraceptive knowledge in all four nations (Table VI). Together they permit a better prediction of wife's contraceptive knowledge than either variable considered alone. However, as with the other patterns of relationship described in this section, the influence of the two independent variables (community education and wife's education) on contraceptive knowledge varies somewhat from one nation to another, which in itself is interesting. For example, the wife's own education has a fairly weak independent influence on contraceptive knowledge among women in those Costa Rican communities where overall educational levels are high. It would appear that general levels of contraceptive knowledge are sufficiently high in Costa Rica that a woman need not have much schooling in order to obtain information on this topic. The presence of urban family planning programs in Costa Rica prior to 1969, and the gradual expansion of these programs into rural areas around the time of the survey, may have assisted in the spread of knowledge. Peru provides a contrasting case where a high level of community education is not enough to bring a woman into contact with information about contraception which is a scarce good. However, some years of schooling in an environment of high levels of education is an important factor to come to contraceptive knowledge. Generally speaking we might state for the four countries that as the level of contraceptive knowledge in the country is higher, a higher level of community education diminishes the impact of the level of schooling of the individual. Peruvian women need both an environment with rather high levels of community education and some years of schooling to become acquainted with contraceptive methods; in Mexico high levels of community education are a sufficient provider of reasonable levels of contraceptive knowledge (more than 50 percent), while in Colombia the great majority of women in environment with very high levels of education know at least one contraceptive method. Finally in Costa Rica, as already mentioned, contraceptive knowledge is widespread.

INSERT TABLE VI ABOUT HERE

The previous indicates that husband's education, community education, and wife's newspaper reading each has an independent influence beyond that of wife's education in predicting her contraceptive knowledge. In order to establish both the relative importance of each predictor and the predictive power of each of them over and above the influence caused by the other predictor variables, to see which one is the best predictor, several multiple regressions were carried out on the data for each country.

In regression, as in the path analysis used in the next section, it is assumed that the relationship between variables are linear and additive which implies the absence of interaction and data measurement in interval scale, although recent discussion would indicate that this last assumption may be relaxed and that ordinal variables give acceptable results (see Boyle, 1970). It seems that the data entering the present analysis closely approximate the necessary conditions. The educational variables measured in years of schooling and mean level of education of the community at least meet the requirement of ordinal measurement, while newspaper reading and contraceptive knowledge are measured in a dichotomy. Although in this case there is no underlying scale, their use is justified by the fact that a mean -understood as a proportion- is a meaningful measure. As for interaction, there appears one evident case in the data when the influence of the independent variables on contraceptive are considered in pairs: in Peru newspaper reading and wife's education are interacting in predicting contraceptive knowledge.

Two types may be distinguished in regression analysis: in one, the common type, all predictor variables are entered at the same moment. The calculations inherent to the analysis will then establish the relative importance of each and the predictors are entered into the regression equation according to the strength of their predictive power. In the other type the investigator is permitted to interfere, deciding which predictor variables he wants to see and where he wants to see them in the equation. The calculations in this case are made in steps (step-wise regression) taking into account first the (group of) predictor(s) which the analyst has assigned the first place, next those occupying the first and second place and so on cumulatively till all the predictors have entered. This step-wise regression was used here, entering wife's education always as either the first or second variable in the equation. The other variables were entered in different combinations (also step-wise), designed to explore various hypotheses. Selected results represented in the net correlation of each predictor with contraceptive knowledge controlling for the other predictors (Beta) the raw correlation (r) and the cumulative correlation (R), are shown in Table VII. These principal findings were:

(1) In all four nations, husband's education scarcely makes any independent contribution to the prediction of contraceptive knowledge once wife's education is controlled. On the other hand, wife's education continues to make a small contribution to the prediction of contraceptive knowledge once husband's education is controlled. Thus, in a regression model, husband's education can largely be ignored as a significant predictor. Comparing the correlation coefficients (r); it is seen that of the three educational variables used, wife's education is the best raw predictor.

(2) Wife's newspaper reading continues to make a small independent contribution to the prediction of contraceptive knowledge even when wife's education is controlled. Although the beta coefficient shows that these two variables are highly interrelated, in a regression analysis they both continue to have some independent influence on contraceptive knowledge.

(3) The level of "community" education adds somewhat to the prediction of contraceptive knowledge, even when wife's education and her newspaper reading are controlled. However, it is also clear that the total increase in prediction by adding wife's newspaper reading and "community" education

is very little once the influence of wife's education has been taken into account. (The multiple correlation of all three variables on contraceptive knowledge is in all four nations only somewhat greater than the simple correlation between wife's education and contraceptive knowledge. The greatest difference is 7 points, in Mexico).

(4) Comparing the net predictive power, i.e., controlling for the correlation between predictors, the fall in correlation coefficient is remarkable (r to beta). Wife's education is in all countries, safe for Peru, the best educational predictor; in this last country community education level is of equal importance (.23 and .24). The separate influence of newspaper reading is relatively strong; Colombia presenting the exceptional case of a strong interrelation between education of wife and newspaper reading, in which the last seems to be the real important factor which influences in contraceptive knowledge.

(5) The level of prediction of contraceptive knowledge using wife's education, newspaper reading, and "community" education is greatest in Peru (R = .52), substantially less in Colombia and Mexico (R^2s of .32 and .33, respectively) and relatively very low in Costa Rica (R = .24). This pattern corresponds closely to the overall proportions who know about contraceptives in each of these four nations. The prediction is lowest in Costa Rica where contraceptive information is most widespread, and highest in Peru where it is least widespread. Although this finding is not surprising in the case of Costa Rica because, given a high general level of contraceptive knowledge, there remains little variance to be explained, it is interesting that at lower levels of contraceptive knowledge the information flow variables make a rather great contribution to the prediction, suggesting the applicability of a model as proposed in the introduction (see Chart 1), at least for the incipient stages of diffusion of contraceptive knowledge.

INSERT TABLE VII ABOUT HERE

In order to establish the fit of this model we used a regression technique commonly referred to as "path analysis", which will be discussed in some details as the method is relatively little used. It permits the investigator to put the predictor variables in a causal or time sequential model and to assess the influence of each antecedent variable on each consequent variable. This is done by taking only those correlations between predictor variables and between predictor variables and the dependent variable into account which theoretically make sense. Thus, a variable like husband's education is dealt with both as a consequent variable (in the model it is influenced by level of education of the community see Chart 3) and as an antecedent variable (it influences contraceptive knowledge). The existing correlation with f.e. newspaper reading by the wife is not considered because it did not seem of interest. On the basis of the remaining relationships the beta coefficients are recalculated and standardized to make them directly comparable with one another. This means that the path coefficients measure the direct influence of variable X on variable Y in terms of the fraction of the standard deviation of Y due to X

when other factors are held constant3/

In path analysis, various kinds of variables are distinguished. First, we may distinguish exogenous variables; these are variables which are not dependent on any other variable within the model and appear at the start of the causal chain. In the present analysis community education is the only exogenous variable. In second place exist endogenous variables; these are variables which are at least in part dependent on other variables within the system. The variable contraceptive knowledge is an endogenous variable in our model, as are the variables: wife's education, newspaper reading, and husband's education. Finally, we may distinguish several residual variables; these are hypothetical variables introduced in the model to account for the residual variance in the endogenous variables (that is, to account for the variance unexplained by the exogenous and endogenous variables). By definition, all variance in the model is explained by some combination of these three variables.

Path Analysis results for Peru

We examined our causal model with the data for Peru, since it is in this country that we find the highest relationships between wife's education and contraceptive knowledge, and also the beta coefficients are the most promising. Some of the results for this analysis are shown in Chart 2 (three explicative variables) and Chart 3 (four explicative variables). The path coefficients in these charts are shown in bold face, while the original correlation coefficients are given in parentheses beside the path coefficients.

INSERT CHARTS 2 AND 3 ABOUT HERE

The findings shown in Chart 2 indicate that each of the three explicative variables has a predictive value of its own. Community education continues to be a predictor of contraceptive knowledge (coefficient of .20) even when the mediating and independent affects of wife's own education and newspaper reading are taken into account. It is of interest to note that the relationship between community education and wife's newspaper reading is not entirely mediated by the wife's own education. The direct affect of community education on wife's newspaper reading is represented by the coefficient of .23, while the coefficient of .28 (i.e., .46 x .60 = .276) represents the indirect influence of community education on newspaper reading (i.e., the affect, operating through wife's own education). This indicates that women with a given level of education are more likely to read newspapers if they live in communities where the general level of education (and presumably newspaper reading also) is higher.

Newspaper reading is clearly a link in the chain between education and contraceptive knowledge in Peru. As Chart 2 indicates, there is a path coefficient of .21 between newspaper reading and contraceptive knowledge.

3/ For a more detailed discussion of path analysis, see for example K.C. Land (1969).

Since the wife's own education influences newspaper reading, part of its affect on contraceptive knowledge operates through newspaper reading. This indirect affect may be summarized by the coefficient .13 (i.e., .60 x .21= .126). The direct affect of wife's own education on her contraceptive knowledge is represented by the coefficient of .21. Thus, the direct affect is nearly twice as strong as the indirect affect, suggesting that other variables not specified in our model serve to link personal education with contraceptive knowledge.

Introducing husband's education (Chart 3) into the preceding analysis does not change the overall level of prediction of contraceptive knowledge, but it does change our assessment of the relative importance of wife's own education in contributing to contraceptive knowledge. The husband's education appears to have a direct influence (represented by the coefficient .15) on his wife's contraceptive knowledge. When this is taken into account the direct influence of wife's education on her contraceptive knowledge falls from a coefficient of .20 (Chart 2) to .10 (Chart 3). This reconfirms the earlier finding that husband's and wife's education both contribute to the wife's contraceptive knowledge, although there is no predictive power lost if husband's education is not considered because of the correlation between these two educational variables: wife's education accounts for the variance in both.

Additional path models were explored with the Peruvian data, but these did not appear to contribute any new findings to those outlined above. For example, the existence of running-water and electric light in the house as a second exogenous variable (in addition to community education) does not change the total prediction nor the pattern of interrelationships greatly.

Path Analysis Results for Costa Rica, Colombia and Mexico

The model described above does not serve well in the other nations. For example, in Costa Rica, the combination of all predictor variables (including husband's education and running-water/electric-light in the house) explain only a small proportion of the variance in contraceptive knowledge. Newspaper reading is of little importance in this model. The variable with the highest explicative contribution is the presence of running-water and electric-light in the home, although the direct path coefficient of this variable on contraceptive knowledge is only .11. In Colombia and Mexico the levels of prediction are somewhat better, but do not arrive to the level shown previously for the Peruvian data. In both of these countries the influence of wife's education on contraceptive knowledge goes partially through newspaper reading, but the affect is not as strong as it is in Peru.

DISCUSSION

In this paper we have sought to describe the influence of various measures of education and associated variables on contraceptive knowledge. It was found that education of husband and wife apparently both make a contribution to predict contraceptive knowledge. However, in regression and path

analysis which make predictions for the typical case and not for exceptional combinations of characteristics, it turns out clearly that wife's education is a sufficient indicator to cover the predictive power of both. Next we established that as diffusion of knowledge starts, as is the case in Peru, a great part of the relation between wife's education and contraceptive knowledge goes through newspaper reading. However, information also comes from the wider community. As contraceptive knowledge becomes general, as is the case of Costa Rica, in any district access to it is possible having a certain, rather low, level of education. Other factors than schooling, probably personality and demographic factors, account here for the existing differences in contraceptive knowledge. This leads to the general conclusion that the information flow model used serves for the stage of incipient diffusion in which there is a latent category of women interested to know more.

In the cross tabulations we found cases of women with some relatively rare combinations of characteristics which were useful to indicate the independent affects of all variables used in predicting contraceptive knowledge. Although we might expect that these women differ in other aspects as well, the findings suggest what might happen were social policies to be changed so that the rare combinations of characteristics become more common. We believe that social changes which affect our explicative variables, will cause through them a rather rapid rise in levels of contraceptive knowledge.

Chart 2

PERU : A PATH MODEL OF CONTRACEPTIVE KNOWLEDGE USING THREE EXPLICATIVE VARIABLES:

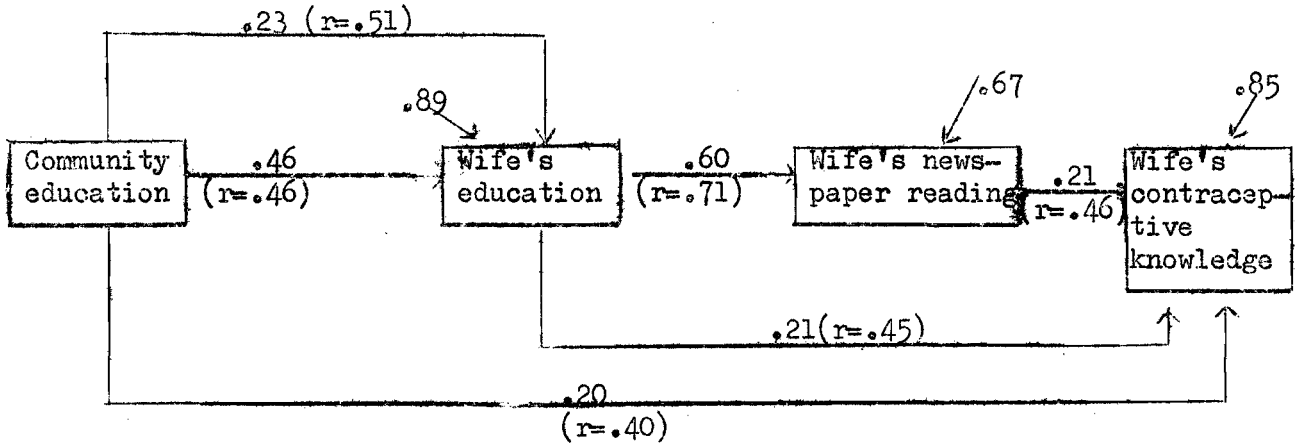


Chart 3

PERU: A PATH MODEL OF CONTRACEPTIVE KNOWLEDGE USING FOUR EXPLICATIVE VARIABLES

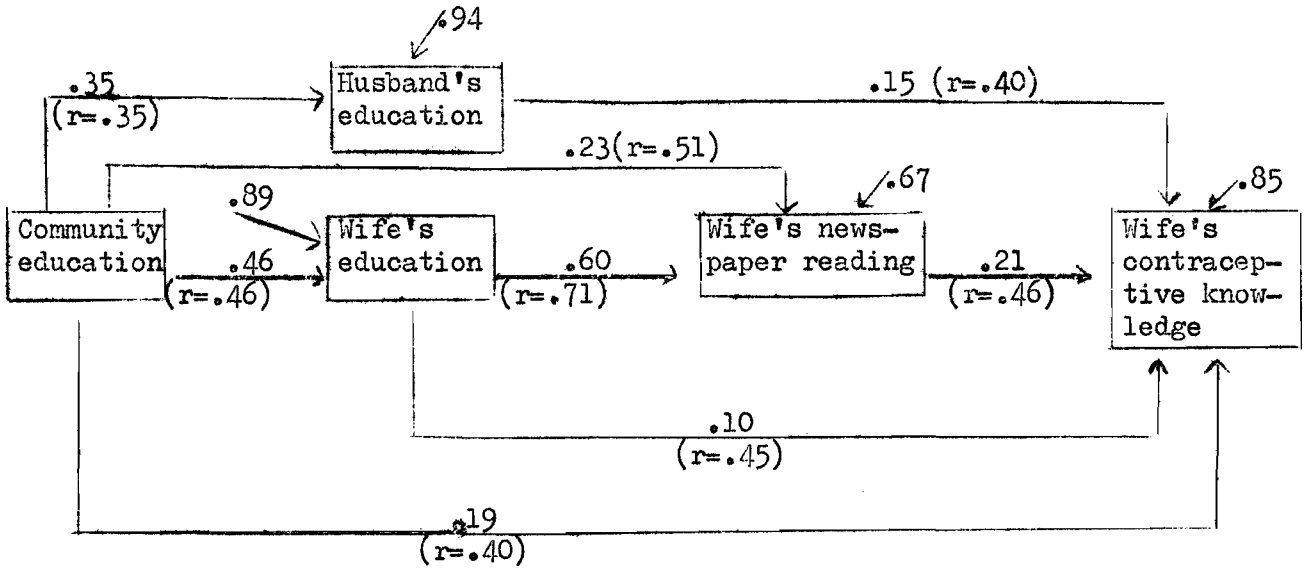


Table I

FOUR COUNTRIES: PERCENT DISTRIBUTION OF ALL WOMEN IN UNION IN THE VARIABLES USED

Variables	Costa Rica	Colombia	Mexico	Peru
Wife's education				
1. Without schooling	18	27	37	46
2. Primary incomplete	64	56	52	34
3. Primary complete or more	8	17	11	20
Husband's education				
1. Without schooling	19	29	29	17
2. Primary complete	56	38	53	47
3. Primary complete or more	17	18	11	33
Doesn't know	8	15	7	3
Education's level of the district (percent of individual cases)				
1. Very high	25	20	9	26
2. High	54	23	18	4
3. Low	19	41	40	17
4. Very low	2	17	34	54
Percentage of newspapers readers	74	70	52	76
Percentage of radio listeners	81	77	74	53
Percentage who recognize at least one contraceptive method	84	67	53	28

Table II

FOUR COUNTRIES: PERCENT DISTRIBUTION OF HUSBAND'S EDUCATION BY WIFE'S EDUCATION

Education	Costa Rica	Colombia	Mexico	Peru
Wife: without schooling. Husband: without schooling	35	52	45	33
Primary incomplete	48	25	51	53
Primary complete or more	17	23	4	14
Wife: Primary incomplete. Husband without schooling	18	23	22	5
Primary incomplete	69	56	67	60
Primary complete or more	13	21	11	35
Wife: Primary complete. Husband without schooling	3	4	3	0
Primary incomplete	49	27	45	14
Primary complete or more	48	69	52	86
Percentage of wives with less education than husband	20	25	26	43
Percentage of wife and husband on same level	59	57	57	53
Percentage of wives with more education than husband	21	18	17	4

Table III

FOUR COUNTRIES: PERCENT DISTRIBUTION OF WIFE'S EDUCATION AND EDUCATIONAL LEVEL OF THE DISTRICT IN WHICH THEY LIVE

District's educational level a/	Costa Rica					Colombia					Mexico					Peru				
	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total
Wife's education:																				
without schooling	10	17	25	33	18	10	18	26	54	27	17	18	31	59	37	17	31	35	68	46
primary incomplete	59	67	64	56	63	53	63	62	39	56	56	65	60	39	52	39	49	46	26	34
primary complete or more	31	16	11	11	18	37	19	12	7	17	27	17	17	2	11	44	20	19	6	20
Number of cases	283	704	250	36	1 273	283	390	705	329	1 707	187	309	786	689	1 971	412	77	369	873	1 731

a/ 1: educational level of the district is based on quartile distribution of the total sample.

1 = very high (upper 25 percent of the districts);

2 = high;

3 =(low);

4 = very low (lowest 25 percent of the districts).

Table IV

FOUR COUNTRIES: CORRELATIONS BETWEEN MEASURES OF EDUCATION, LEVEL OF LIVING MASS MEDIA CONTACT

	1	2	3	4	5	6 a/
1. District's educational level	-	.29	.40	.36	.46	.32
2. Husband's education	.29	-	.65	.36	.34	.23
3. Wife's education	.40	.65	-	.56	.40	.34
4. Newspaper reading	.36	.36	.56	-	.33	.34
5. Water or electric light in the house b/	.46	.34	.40	.33	-	.33
6. Contraceptive knowledge	.32	.23	.34	.34	.33	-

a/ Numbers refer to the variables of the first column.

b/ Electric light/water: 1) nothing; 2) electric light; 3) water; 4) electric light and water.

Table V

FOUR COUNTRIES: PERCENT DISTRIBUTION OF WOMEN WITH CONTRACEPTIVE KNOWLEDGE BY WIFE'S AND HUSBAND'S EDUCATION AND BY WIFE'S EDUCATION AND NEWSPAPER READING

	Costa Rica					Colombia					Mexico					Peru				
Wife's education	1 a/	2	3	4	Tot.	1	2	3	4	Tot.	1	2	3	4	Tot.	1	2	3	4	Tot.
Husband's education																				
1 a/	66	76	79	(100)	74	49	62	61	68	55	38	43	54	(100)	42	14	27	(14)	- c/	15
2	84	77	87	95	85	47	69	75	85	67	42	50	64	78	52	9	17	28	(44)	14
3	82	81	89	92	87	38	75	73	76	70	45	50	59	89	57	8	21	30	54	21
4	(82) b/	90	97	99	97	63	77	73	91	82	52	83	74	91	80	19	33	48	68	50
Total	72	80	88	96	84	49	69	70	87	67	40	51	60	89	53	12	24	39	65	28
Newspaper reading																				
NO	72	73	82	97	77	47	63	52	67	53	38	45	49	79	43	11	17	14	15	13
YES	75	86	90	96	90	73	75	79	90	81	61	62	68	92	71	(40)	35	49	68	56
Total	72	80	88	96	84	49	69	70	87	67	40	51	60	89	53	12	24	39	65	28

a/ 1: Without schooling; 2: 1-2 years primary school; 3: 3 years primary-primary incomplete; 4: primary complete or more.

b/ Percentages between brackets are based on 5-20 cases.

c/ Less than 5 cases.

Table VI

PERCENT DISTRIBUTION OF WOMEN WITH CONTRACEPTIVE KNOWLEDGE BY DISTRICT'S EDUCATIONAL LEVEL AND WIFE'S EDUCATION

District's educational level	Costa Rica				Colombia				Mexico				Peru			
	1 a/	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Wife's education:																
Without schooling	85	73	73	(67) b/	72	54	43	50	58	60	37	39	19	18	11	11
Primary incomplete	90	85	77	85	78	71	65	65	60	68	51	52	55	48	22	15
Primary complete or more	99	95	93	+ c/	88	87	87	74	90	89	87	(88)	68	(75)	69	48
Number of cases	283	704	250	36	283	390	705	329	187	309	780	689	412	77	369	873

a/ 1: Very high educational level;
2: High
3: Low
4: Very low

b/ Data between brackets refer to categories from five to twenty cases.

c/ + = Less than five cases.

Table VII

STEPWISE MULTIPLE REGRESSION IN CONTRACEPTIVE KNOWLEDGE: FOUR COUNTRIES

Predictor variable	Costa Rica			Colombia			Mexico			Peru		
	Beta a/	r b/	R c/	Beta	r	R	Beta	r	R	Beta	r	R
Wife's education	.12	.19	.19	.18	.25	.25	.20	.29	.29	.23	.45	.45
Husband's education	.09	.18	.21	.06	.21	.26	.09	.24	.30	.15	.40	.46
Educational level of the district	.09	.13	.22	.10	.17	.27	.07	.18	.31	.24	.40	.51
Husband's education	.09	.18	.18	.06	.21	.21	.09	.24	.24	.15	.40	.40
Wife's education	.12	.19	.21	.18	.25	.26	.20	.29	.30	.23	.45	.46
Educational level of the district	.09	.13	.22	.10	.17	.27	.07	.18	.31	.24	.40	.51
Newspaper reading	.11	.18	.18	.21	.29	.29	.15	.26	.26	.21	.46	.46
Wife's education	.12	.19	.22	.12	.25	.31	.19	.29	.32	.21	.45	.49
Educational level of the district	.09	.13	.24	.07	.17	.32	.07	.18	.33	.20	.40	.52

a/ Beta: Coefficient which indicates the net influence in the dependent variable, holding constant the other predictor variables used.

b/ r: Correlation coefficient

c/ R: Multiple correlation coefficient which indicates the cumulative predictive power of the used variables.

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