Title

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Impact of Formal Education of Women on Reproductive Behavior in Four Socio-Cultural Contexts in the Soconusco Region of Chiapas

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Benito Salvatierra Izaba
Austreberta Nazar Beutelspacher[1]

Summary

This paper analyzes demographic changes that occurred between 1977 and 1996, in four socio-cultural contexts in the Soconusco Region of Chiapas, Mexico. It is based on a socio-demographic random sample survey that compiled primary (1139 household groups) and secondary (population and agricultural census) information.

The results based on cohort analysis provide evidence for the existence of various fertility trends among the different socio-cultural contexts. In average urban settlements, fertility has remained low stable, and in rural indigenous settlements it has also remained stable, but high. Only in rural mestizo and marginal urban communities have there been overall and significant fertility declines. In marginal urban settlements, in spite of showing a generalized fertility decline, adolescent fertility has increased. These trends are closely related to the changes in schooling levels achieved by females, particularly with secondary or higher education, as well as with modifications in the age at first union. There has been a reduction in the proportion of women completing secondary education in all of the socio-cultural contexts, which goes hand-in-hand with the economic polarization of the region.

Based on models of impact evaluation, it is possible to conclude that due to the characteristics of the Soconusco "with elevated macroeconomic development and deep social polarization", the State's efforts must be primordially oriented to improving the lot of the population, especially with regards to average education of women.

Key words: Reproductive behavior, fertility, formal education, socio-cultural context, Soconusco, Chiapas.

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Introduction

Formal education of women is considered one of the main determinants of modern demographic transition (Bhattachrya and Sing 1995), since it shows a positive relationship to contraception and a negative one with fertility, which has been documented throughout practically all of the world (Jejeebhoy 1995).

From the perspective of modernization, female access to formal education is considered a possible destabilizing influence on the patriarchal family, by changing power relations among generations (Caldwell 1987). Similarly, female schooling increases child costs, increases the opportunity for paid labor, access to information and contraceptive use, delays the age at first union, and modifies values and norms related to fertility (Easterlin 1983, Ebrenfeld 1994, Castro 1995).

Due to the foregoing, formal education for women has been considered a key element for development. In general terms, it is acknowledged that formal education affects the quality of life, the ability to achieve a favorable economic situation, and perceptions related to personal individual goals (Muhuri 1995). However, there has been significant criticism of this view, considering that although there is extensive educational coverage, it is pyramidal, the lowest levels have extended coverage of low quality and at the postgraduate levels there is low coverage but high quality, so that urban settlements are benefited over rural ones and high social strata over lower ones (Castro 1995).

It has also been said that the change from illiteracy to primary education holds no competitive advantage for women, and that female education *per se* is an individualist solution that is not aimed at transforming the power relationships that subordinate women (Benería and Sen 1986), and even that it constitutes a significant source of socialization for the reproduction of gender inequalities (González 2000).

On the other hand, when one delves further into the analysis of the relationship between educational levels acquired by women and fertility levels, there is no clear correspondence. For example, when one compares urban and rural fertility, controlling for formal education, there are no significant differences (Rubin 1989). It has also been documented that the effect of female schooling is less than that ascribed to other explanatory factors for contraceptive use, such as socio-economic conditions of the household group, place where births are delivered, and infant mortality, and that its effect varies significantly by women's age and at different reproductive moments (Nazar 1999).

The foregoing hinders recognition of a definite relationship between fertility and schooling, and poses the need for considering the importance acquired by women's education in different socio-cultural contexts, on which depend its effect on reproductive behavior.

This paper is aimed at evaluating the impact of the formal education of women on reproductive behavior in four different socio-cultural contexts in the Soconusco Region of Chiapas. Based on a non-concurrent cohort analysis we will show the differential

effect of educational policies in the different socio-cultural contexts in the region and the different possibilities of relationship with reproductive behavior, given the general impoverishment of these populations in recent years.

The comparison between domestic groups and the importance of the socio-cultural context for evaluating the impact of formal education on fertility

This study considers as an indicator of fertility within the milieu of household groups, the reproductive behavior women experience, understood as the sum of conducts appropriate to the couple, imbued with social values and differentiated according to their socio-economic, ethnic, or gender insertion as individuals within the family with regard to the socio-cultural context, which determines the number of children and the family's biological reproduction (Salvatierra-Izaba 2000, González-Cervera 1998). This definition contributes to other fertility indicators utilized more frequently in socio-demographic analysis, since it enables an analysis of this process within the milieu of the household groups and acknowledges the difference among them, contributing elements for understanding fertility behavior at the aggregate level.

Reproductive behavior (RB) is an indicator of a household group's biological reproductive velocity. This is established on the basis of two fertility-related variables: the age of the woman at the time of the birth and her level of parity. In this sense, women were classified into three *age* groups: 15-24, 25-34, and 35-49, for early, mature, and declining biological reproduction, respectively. The other variable was *parity*, which was classified according to the median number of children for each age group in the region under study. Three groups of women were formed based on the two classifications, those with *slow*[2], *medium*[3] and *rapid*[4] RB (Table 1).

This indicator constitutes a flexible proposal insofar as it uses regional fertility parameters for the cutoff points on the number of children, to establish reproductive velocity within each age group. The advantage behind this is that the criteria are not established based on conditions alien to the populations under study, and these parameters can be determined for microregions or for extended regions, such as states.

The most important advantage of this indicator is that it allows us to interrelate individual variables of the women in reproductive ages and the household group belonging to the same analytical dimension, with their reproductive behavior, which allows us to establish models to predict the impact of family planning and education policies and programs, among others, on fertility reduction. Similarly, it allows us to visualize the impact of social inequality on aggregate indicators. For the foregoing, we consider that it is a useful indicator for evaluating health, population, and education programs.

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[2] *Slow* reproductive behavior is present, if in the 15-24 age group they had ? 1 child, in the 25-34 age group if they had ? 2 children and in the 35-49 group if they had ? 3 children born live.

[3] *Medium* reproductive behavior, if in the 15-24 age group they had 2 children, in the 25-34 age group if they had 3 children and in the 35-49 group if they had 4 children born live.

[4] *Rapid* reproductive behavior, if in the 15-24 age group they had ? 3 children, in the 25-34 age group if they had ? 4 children and in the 35-49 group if they had ? 5 children born live.

The reproductive behavior indicator must be analyzed taking into account the peculiarities of the socio-cultural context within which family planning and education programs acquire significance.

The context has been defined as a spatial-temporal scenario within which reference is made to particular fields of interaction of the subjects, to social institutions, and to structures that delimit the extent of possible actions and the possibility of their own transformation, within which asymmetrical social relationships and hierarchies exist that permeate all of the characteristics of the household groups and individuals from the social context (Salles, 1999). Thus, it is the space that determines and grants sense to reproductive behavior under social, economic, political, cultural, and institutional specificities and particularities.

The population under study

This study took into consideration four different socio-cultural contexts, which co-exist in the Soconusco area of Chiapas: rural mestizo, rural indigenous, urban middle, and urban marginal.

The basis for this study is the *Encuesta de Salud Reproductiva and Sobrevivencia Infantil* (Survey on Reproductive Health and Infant Survival, ESRYSI 1997), a socio-demographic cross-sectional study carried out in Tapachula Municipality, Chiapas (Figure 1). This Municipality was selected as typical of the Soconusco region, since it represents all of the social, cultural, economic, and demographic diversity of this region of Chiapas bordering on Guatemala, and which holds 38.4% of the population in the Soconusco. It has the highest intercensal population growth rate in the state, estimated at 4.0 for the period 1970-90. It is a high-density population, with one of every four *Chiapanecos*. Additionally, it is home to one of the two most marginal zones in the state of Chiapas, while at the same time constituting the most important center of agricultural production along the southern border of Mexico (Salvatierra 1995 and 2001).

Nineteen sampling sites were selected within this municipality: communities, farms, and neighborhoods in the city of Tapachula, which were grouped into two categories: urban and rural. The urban area was also divided in two strata, one with marginal populations located in irregular settlements, which was called “urban marginal” (Colinas del Rey, La Gloria, and San Benito Abad in Puerto Maderos) and another consisting of population with a more favorable socio-economic condition and located in the city’s regular zone, which was classified as “urban middle” (San Caralampio, Colonia 16 de septiembre, Barrio Nuevo, Los Laureles, and Tapachula center). The rural settlements were classified in two categories according to their ethnic majorities: “rural mestizo” (La Cigüeña, Joaquín Miguel Gutiérrez, Conquista Campesina, Carrillo Puerto, and the coffee plantations San Nicolás and Perú-París) and “rural indigenous” (Pavencul, El Pinal, La Patria, Mario Souza, and Ejido Villahermosa). As a result, the study areas were grouped into four socio-cultural contexts: rural mestizo, rural indigenous, urban middle, and urban marginal (Table 2).

The estimated sample size was 2242 persons from the general population[5]. Calculating an average of 5.5 persons per dwelling, we reached an estimate of 415 household groups. Since the initial study design included three regions (one urban and two rural), the estimated sample size was applied to each one of them.

The communities were selected on the basis of regional knowledge among the researchers and considering that representativeness was needed for the different economic, social, political, and cultural aspects within the Soconusco region, as well as approval from assemblies and institutions in the pre-selected communities.

The information was obtained between October 1996 and March 1997, with a structured questionnaire consisting of two sections, one, socio-demographic, which was applied to the head of household, and the other, on aspects relating to reproductive behavior and child survival, which was applied to all women aged 15 to 49 years of age in union or ever in union, in each household group. The interviews were carried out by five medical residents, two social workers and a male nurse, all of whom received 30 days of training in advance, supervised by the researchers.

The initial analysis included estimates of the levels of schooling achieved by the women in each age group, based on four cohorts corresponding to the period 1977-1996. This was estimated overall and by context, to elucidate the differential impact of educational programs in the region. Later, the relationship between reproductive behavior and women's schooling was analyzed, and a predictive regression model with multiple levels was prepared (Ángeles 2000) for each context.

Women's schooling and trends during the period 1977-1996

Average illiteracy among women 15 to 49 years in the region was 28.9%. Upon analyzing the schooling achieved by the women by age cohorts, a significant reduction was seen in the illiteracy rate, which dropped from 48.9% among those 40-49 years of age, to 11.9% among those 15 to 19 years old.

The decline in illiteracy has been important in all of the contexts, although there is an important lag in the rural settlements, particularly in the rural indigenous context (Figure 2).

In spite of the fact that the number of women unable to read and write has dropped, of those that can, a large proportion of women do not complete primary education: 33.8%. If we add the un-schooled women and those with incomplete primary, we come close to two-thirds of all of the women (62.7%). In the rural indigenous context, this proportion reaches 84.0%; in the rural mestizo it is 64.0%; in urban marginal it is 65.2%, and in urban middle it is 22.6% (one of every four women).

[5] To calculate the sample size, we took the following into consideration: i) the estimated infant mortality rate for the 14 municipalities in the region, which varied between 37.6 and 65.2 per thousand children less than one year of age, for a prevalence of 50.6 deaths per thousand recorded live births (p=0.0506); ii) the sampling or precison error of 15.0% ($\varepsilon = 0.15$); and, iii) the level of confidence on 90.0% (z = 1.64).

Thus, we can see that in spite of the advances reported in women's literacy, the levels of schooling achieved are still extremely low, especially in rural and urban marginal areas. In fact there has been a significant retrocession in the proportion of women that reach secondary education in all of the contexts, which is probably associated with the impoverishment of these populations during the decade between 1986 and 1996, notwithstanding the reported increase in GDP within the region (Salvatierra, 2001).

For example, within the urban middle context, the proportion of women with secondary or higher education fell from 82.9% to 50.0%; to wit, a 65.8% drop. In the urban marginal context the drop was from 26.8% to 23.5% (a 14.0% drop); in rural indigenous, from 4.3% to 0.0% (100.0% reduction); in rural mestizo, from 29.3% to 26.1% (a 12.3% drop). As we will see below, this retrogression has fundamental implications for reproductive behavior and the possibility of reducing fertility in each of the socio-cultural contexts considered.

Reproductive behavior by context

From the sample of 988 women in union or ever in union with live-born children, it was possible to obtain complete information on the reproductive behavior of 916 (rate for incomplete information, 7.3%).

The results recorded that the proportion of women with a *rapid* reproductive behavior in the urban middle settlements was 5.5%; in urban marginal it was almost four-fold higher (19.1%); in rural mestizo settlements it was higher yet (23.1%); and among the indigenous group is was approximately nine-fold higher than the first group (46.6%).

The extremes are held by women from urban middle and rural indigenous socio-cultural contexts, with the *slowest* and most *rapid* reproductive indices, respectively, while between the rural mestizo and urban marginal groups there are practically no significant differences.

Similarly, we can see that for the municipality as a whole, one of every four women (25.2%) studied reported *rapid* reproductive behavior. The *middle* and *slow* reproductive behaviors correspond to 36.2% and 38.6% of the women, respectively.

In synthesis, the results show that *rapid* reproductive behavior is higher in rural indigenous settlements; *middle* prevails in rural mestizo and urban marginal settlements; and, *slow* is most common in urban middle sites (Figure 3).

The differences in *rapid* RB between the extreme values indicate that there is nine-fold more reproductive velocity in rural indigenous settlements (46.6%) with regards to urban middle groups (5.5%); in this sense, it is also worth noting that the differences between the urban marginal and rural mestizo contexts are minimal, only 4.0% (Table 3).

The results to this point show that in the region under study, at the time of the survey, there were three defined fertility schemes: first, that of the urban middle areas, which are in better socio-economic conditions with a large proportion of women with a *slow* reproductive behavior, corresponding to a TFR_{15-49} of 2.54 children per woman on the

average, a rate below that reported by CONAPO (1997) for the whole state of Chiapas (3.71 for the period 1992-1996); **second**, that of urban marginal (TFR_{15-49} of 5.06) and rural mestizo settlements (TFR_{15-49} of 3.24), whose average (TFR 4.2) is close to that recorded for the whole state of Chiapas for the same period 1990-1995 (4.16) (CONAPO, 1998); finally, the third is that of the indigenous settlements (TFR_{15-49} of 5.68), where *rapid* reproductive behavior has produced a total fertility rate similar to that reported by CONAPO (1998) for Chiapas during the period 1975-1985, which falls between 6.24 and 5.21.

Potential impact on reproductive behavior of secondary education for women

The bivariate analysis shows the importance of secondary education for women in the greater probability of having a *slow* reproductive behavior. However, secondary education for the husband also had an effect on increasing *slow* reproductive behavior, this association is one fifth that recorded for that same level of education among the women (X^2_{LR} = 156.5 versus X^2_{LR} =27.5) (Table 4).

Thus, it is clear that given the importance of this association, any modification in the proportion of women with secondary or higher education would have a substantive impact on reproductive behavior and thus, on fertility levels in each context.

In this sense, if all of the women in fertile ages accomplish secondary education, we could expect a significant reduction in *rapid* reproductive behavior, since it would drop from 27.6% in women with incomplete primary or less, to 7.6% among women with secondary education or higher (a reduction potential of 69.8%) (Figure 4).

However, we have reported that although the illiteracy levels declined over 20 years (1977-1996), the number of women achieving secondary or higher education also dropped together with a reduction in age at first union, in all contexts, but particularly in urban areas.

For this reason, a significant reduction in the velocity of reproductive behavior and fertility would not be expected, in spite of the fact that contraceptive usage has increased throughout the region, climbing from 38.1% between 1977 and 1981 to 60.3% between 1992 and 1996[6].

This can be explained by the fact that in this region, contraception is used to limit the number of children and not for spacing births; thus, the younger generations that have not reached the desired number of children, are the ones expressing the greater probability for *rapid* reproductive behavior associated with a significant reduction in age

[6] These estimates were made considering only those women between 15 and 39 years of age.

at union[7] and early school drop-out. Nevertheless, the potential impact of the increase in secondary education for the women was different in each socio-cultural context.

Upon analyzing the potential impact of formal education by socio-cultural context, we found that reductions of 80.0% are achieved in the urban middle context (going from 5.5 without schooling or incomplete primary to 1.1% with completed secondary or higher), 6.8% in urban marginal (from 19.1 to 7.1%), by 66.7% in rural mestizo (from 23.1 to 7.7%), and up to 56.2% in rural indigenous (from 46.6 to 20.4%). Furthermore, in a prior study (Salvatierra 2000), we investigated the impact of health and social development policies; these were, however, significantly less than those seen for formal education (Figure 5).

Discussion

The grounds for this study, based on a complex analysis that articulates reproductive behavior for interpersonal comparisons in specific contexts, documents the variations in reproductive behavior and in the fertility-schooling relationship in these women.

In order to be able to analyze fertility behavior within the milieu of household groups, and on an individual basis, to make comparisons among women, we prepared the operational definition for reproductive behavior, using the number of children and ages of the women, which allowed us to identify three categories: *rapid, medium,* and *slow*, which were contrasted in order to prepare explanatory models for the relationship schooling-fertility. This indicator, set up on the basis of the woman's age and parity, is a methodological proposition in this study, based on indicators related to child survival (Schlaepfer-Pedrazzini 1990, Hobcraft 1992), since reproductive behavior is subject to the same determinants as fertility; i.e., mother's schooling, living and working conditions, organization of household groups, and cultural norms and the impact of public policies (Torres 1984, LeVine 1991, García, Flores and Tovar 1995, Misawa 1996).

This approximation provided data on the distribution of different types of reproductive behavior within each context, particularly in its relationship to formal education.

Specifically, in the analysis in this study it was possible to consider changes in RB were partially explained, on the one hand by the impact of governmental programs (such as family planning and education), factors whose importance had been indicated by Easterlin (1983), Bongaarts and Parker, *et al.* (1990), and Cleland and Parker (1990); and on the other, due to the socio-economic conditions of the household groups

[7] Age at union has also registered a variation in these contexts: in urban middle, four of every ten women entered a union before age 20, without important variations for the period of the study; in urban marginal 67.1 % of the women were in union before age 20, and those in union at 20 years dropped from 85.0% in women 40 to 44 years to 66.3% in women aged 25 to 29 years; in rural mestizo 75.6% were in union before age 20, a proportion that is approximately stable throughout the period; finally, in the rural indigenous, 76.7% were in union before age 20 years; currently, the percentage of early unions is greater than among the older women, with 79.4% and 70.9%, respectively (Salvatierra, 2003). The variations in age at union are possibly explained by migration processes of young women (from the countryside to the city). In a similar fashion, this is due to significant health services coverage, and thus, ample exposure to family planning programs operating in the region since 1979.

(Villasmil 1998, Quesnel 1998) in the sense that the poorest families are the ones with the highest fertility. This high fertility in some contexts cannot be explained merely on the basis of a lack of knowledge and availability of contraceptives, rather, it includes specific social relations in each socio-cultural context, where the gender division of labor, the educational and labor situation of women, support networks, and authority within the family acquire meaning (Caldwell 1976 and 1978, Cain 1982), and determine the possible impact of family planning and education policies and programs.

Due to the fact that this study was carried out on a strictly quantitative basis, some important aspects indicated by different authors for the change in fertility, such as the relations of power within families (Caldwell J., 1997 and Caldwell J, Khuda B.E., Caldwell B., Pieris I., Caldwell P., 1999) or the perception of the value of children by the mother and the father within the framework of the gender division of labor, were not dealt with in depth, since they require a qualitative approach. However, the findings document the importance of formal education and social relations in the different socio-cultural contexts to explain the demographic change in this region of Chiapas.

In other words, the study documents the importance of analyzing on a specific basis each socio-cultural context, and evaluating the possibility of intervening in a differential form from public policies to modify fertility. It is important to note that in spite of the fact that within the national milieu and in the contexts studied, the illiteracy rate has declined significantly in both men and women, the proportion concluding secondary education has declined, which implies the step backwards in the population's living conditions in this region and thus, a potential negative impact on their reproductive behavior.

Thus, these policies should be oriented to promoting an increase in median education for women, which will have to overcome the negative effects that the social and economic polarization in the Soconusco have had on formal education. To the foregoing, we must add the detailed analysis of the impact of these economic changes on the educational dynamics of the population in general and for each socio-cultural context, considering the different aspects of its impact on the integration of qualified males and females into the labor market (Caldwell 1980, Cleland and Rodríguez 1988), the possibilities for social promotion (LeVine 1991 and 1994), and the increase in female agency and personal welfare (Nazar 2003).

Bibliography

Ángeles G., Guilkey D., Chen M and E. Montero (2000) *Modelos de multinivel y de panel y su uso para la medición del impacto de programas,* CCP-UCR and CPC UNC-CH, San José, Costa Rica, Central America.

Beneria L. and G. Sen (1981) *Acumulación, reproducción y el papel de la mujer en el desarrollo económico: Una revisión a Boserup*, Sings 7(2).

Bhattacharya B., K.K. Singh, et al. (1995). Proximate Determinants of Fertility in Eastern Uttar Pradesh, *Human Biology* 67(6): 867-886.

Bongaarts J., Parker-Mauldin, W., James, P. (1990) The Demographic Impact of Family Planning Programs *Studies in Family Planning* 21(6): 299-310.

Cain M. (1982) Perspectives on Family and Fertility in Developing Countries, *Population Studies* 36(2): 159-175.

Caldwell J. (1976) Towards a Restatement of Demographic Transition Theory, *Population and Development Review*2(2-3): 321-366.

------. (1978) A theory of fertility from high plateau to destabilization, *Population and Development Review* 4(4): 553-5777.

------. (1980) Mass Education as a Determinant of the Timing of Fertility Decline, *Population and Development Review*6(2): 225-255.

------. (1987). *Toward a Restatement of Demographic Transition Theory. Perspective on Population. An Introduction on Concepts and Issues*. M. S. and M. E. U.S.A., Oxford University Press.

------., Khuda, B.E. Caldwell, B., Pieris, I., Caldwell, P. (1999) The Bangladesh Fertility Decline: An Interpretation, *Population and Development Review* 25(1): 67-84.

Castro-Martín T. (1995). Women's Education and Fertility: Results from 26 Demographic and Health Surveys, *Studies in Family Planning* 4: 187-201.

Cleland J.G., Parker, M.W. (1990) *The Promotion of Family Planning by Financial Payments: The Case of Bangladesh*. Washington, D.C., 13**:** 1-47.

Cleland J., Rodríguez, G. (1988) The Effect of Parental Education on Marital Fertility in Developing Countries, *Population Studies* 42: 419-442.

CONAPO. (1997) *La Situación demográfica de México*. México, D.F., Consejo Nacional de Población.

------. (1999) *Proyecciones de la población de México 1995-2020*. Chiapas. México, D.F., Consejo Nacional de Población.

Easterlin R.A. (1983) *Modernization and Fertility: A Critical Essay. Determinants of Fertility in Developing Countries*. R. Bulatao and R. Lee. New York, Academic Press: 971-991.

Ebrenfeld N. (1994) Educación para la salud reproductiva and sexual de la adolescente embarazada, *Salud Pública de México* 36: 154-160.

García C., Flores M., Tovar V. (1995) México: Comportamiento reproductivo and marginación social 1970-1990. Elementos para un diagnóstico geográfico en salud reproductiva, *Salud Pública de México* 37(4): 279-287.

Gonzalez-Cervera A. (1998) El estudio del comportamiento reproductivo desde una perspectiva cultural, *Estudios Demográficos and Urbanos* 13(1): 141-182.

Hobcraft J. (1992a) Fertility Patterns and Child Survival: A Comparative Analysis, *Population Bulletin of de United Nations* 33: 1-31.

Jejeebhoy S, "Women's education, autonomy and reproductive behavior: experience from developing countries", Oxford: Clarendon Press, 1995. In: United Nations, *Women's education and fertility behavior: recent evidence from Demographic and Health Surveys*, New York, NY, 1995.

LeVine R., LeVine S., Richman A., Tapia F., Correa M., Patrice M. (1994). Schooling and Survival: The Impact of Maternal Education on Health and Reproduction in the Third World. *Health and Social Change in International Perspective*. L. C. Chen, A. Kleinman and N. C. Ware. Boston, Massachusetts, Harvard University Press**:** 303-338.

------. (1991). Women´s schooling and child care in the demographic transition: a Mexican case study, *Population and Development Review*17(3): 459-96, 565, 567.

Misawa T., and O Ixtacuy (1996) Empleo materno and nutrición infantil: trabajadoras de las empacadoras plataneras en Chiapas. *El papel del trabajo materno en la salud infantil. Contribuciones al debate desde las ciencias sociales*. C. Stern. México, D.F., El Colegio de México and The Population Council**:** 293-319.

Muhuri P.K. (1995) Health Program, Maternal Education, and Differential Child Mortality in Matlab, Bangladesh, *Population and Development Review*21(4): 813-834.

Nazar-Beutelspacher A., D. Molina, et al. (1999) Education and Non-Use of Contraceptives Among Women of Low Socioeconomic Levels: The Case of the Border Region of Chiapas, México. *International Family Planning Perspectives* 25(3): 132-138.

------., Zapata E., and V. Vázquez (2003) Does contraception benefit women? Structure, agency and well-being in rural México. *Feminist Economics*, Vol. 9, number 2 & 3.

Quesnel, A., Vimard, P. (1998) Recomposición familiar and transformaciones agrarias. Lectura de dos casos africanos and uno mexicano, *Estudios Demográficos and Urbanos* 13(1): 113-139.

Rubín J.R. (1989) Los determinantes socioeconómicos de la fecundidad en México: cambios and perspectivas, 1984. In: *La fecundidad en México. Cambios and perspectivas.* Figueroa-Campos. México, D.F., El Colegio de México: 249-315.

Salles V. (1999) El trabajo and el no-trabajo un ejercicio teórico-analítico desde la sociología de la cultura'. In De la Garza (Comp.), *Los retos teóricos de los estudios del trabajo hacia el siglo XXI*, Buenos Aires, Argentina, CLACSO.

Salvatierra-Izaba E.B. (2000) *Desarrollo Rural and Población. El caso del Soconusco, Chiapas, México,* Doctoral Thesis in Rural Development Studies, Montecillo, Texcoco, Estado de México, Instituto de Socioeconomía, Estadística e Informática. Colegio de Postgraduados: 325.

------., A. Nazar-Beutelspacher, *et al*. (1995) *Perfil Epidemiológico and Grados de Marginación por localidad en el Estado de Chiapas, México*, El Colegio de la Frontera Sur, San Cristóbal de Las Casas, Chiapas,

------. (2001) Desarrollo rural, políticas de educación and salud and cambios sociodemográficos. Un análisis de las tendencias 1977-1996 en la región Soconusco de Chiapas, México, *Desarrollo Regional en México*, Volume II. CONACyT. México, DF.

-------. (2003) Fecundidad, anticoncepción and contextos socioculturales. Un análisis de tendencias (1977-1996) en la región Soconusco de Chiapas, México, *Estudios Demográficos and Urbanos* 18 (1): 95-125.

Schlaepfer-Pedrazzini L., and J.L. Bobadilla (1990) Relación entre patrones reproductivos and mortalidad infantil: interpretaciones alternativas, *Salud Pública de México* 32(4): 381-394.

Torres-Adrián M. (1984) Cambios en el Comportamiento Reproductivo and su Vinculación con los Cambios en la Estructura Agraria en América Latina. Congreso Latinoamericano de Población and Desarrollo, México, D.F., El COLMEX, UNAM and PISPAL.

Villasmil M.C. (1998) Fecundidad en familias en situación de pobreza: hipótesis para su estudio, *Papeles de población* 18: 175-188.

Table 1. Construction of the Indicator on Reproductive Behavior

	Hypothetically, the Reproductive Behavior was:		
Mother's age (age groups)	**Slow**	**Medium**	**Rapid**
	Number of live born children		
15 to 24	*≤ 1*	*2*	*≥ 3*
25 to 34	*≤ 2*	*3*	*≥ 4*
35 to 49	*≤ 3*	*4*	*≥ 5*

Source: Salvatierra 2000:35.

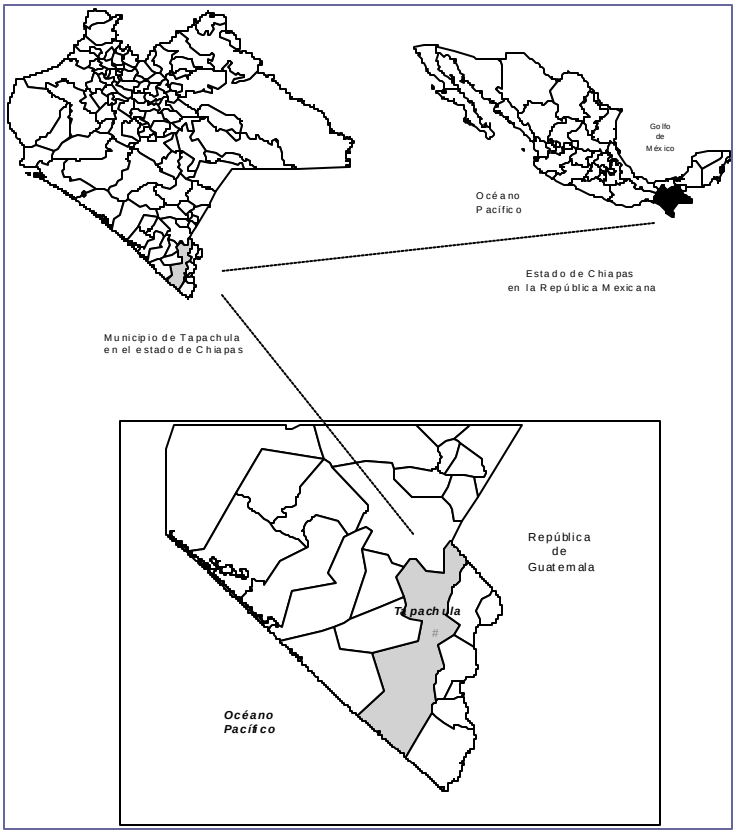


Figure 1. Study Area.

Table 2. Socio-demographic Characteristics of the Communities and Contexts

Communities	***Characteristics***
Urban Middle	
1. San Caralampio 2. 16 de Septiembre 3. Barrio Nuevo 4. Laureles 5. Tapachula Center	These are traditional neighborhoods of different social strata, from the four points of the compass in the city of Tapachula, their inhabitants «in general» have been residing at least one generation (30 years) in their dwellings. The men and women are self-employed in small family businesses, others in trade, and public and private service institutions. With regards to their position at work, a majority are employees and in very few cases they are business owners, hospital and clinic directors, judges, and liberal professionals. Some are farm owners that are involved in the administration and marketing of their products.
Urban Marginal	
1. San Benito Abad 2. Colinas del Rey 3. La Gloria	This population is characterized by its recent migration from the countryside to the city, they occupy land on the city outskirts (which are not always legalized), they do not have all public services, their dwellings are provisional, and are related to those that they had previously in the countryside, round rooms, with smaller livestock within the dwelling. The majority are self-employed, street hawkers, intermediaries for products from the countryside for the city, which they distribute to the urban markets. Very few are employees, and they contract out as day laborers, construction workers, construction superintendents, and maids.
Rural Mestizo	
1. La Cigüeña	It is characterized by its location at the mouth of the Suchiate River on the Pacific Ocean, they are fishermen and some work under contract on the banana plantations. There lands are very poor for traditional crops (corn, beans).
2. Joaquín M. Gutiérrez	This is an *ejido* fully integrated into the market economy. It covers approximately 250 hectares of intensive and mechanized crops; they use pump irrigation, crop rotation with soybeans, corn, beans, and other perennials such as cashews and mangos. The *ejidatarios*, many of whom have significant economic resources, play the role of employers and contract nearby settlers, as well as those from neighboring communities, some of the owners have expanded their staff and live in the city.
3. Conquista Campesina	This is one of the poorest *ejidos*, which was established recently (approximately 15 years), it is 800 meters from the Pacific coast, a majority of the men and women contract out to the banana plantations. Their lands are salt flats, which do not allow cropping, and include, according to the *ejidatarios*, lands extending 200 meters into the ocean.
4. Carrillo Puerto	This is an *ejido* whose settlers are incorporated into the cacao market, others are employees among agricultural enterprises, and approximately half of them are owners of small coffee farms. They have a good transportation system, the *ejidatarios*' children have been able to complete their basic and intermediate education, and many are no longer dedicated to agriculture.
5. San Nicolás 6. Perú-Paris	These are two of the most important coffee plantations in the Soconusco; all of the production is destined for export. The families of the permanent farm workers on these farms were interviewed, in general they are mestizos who are the employees that coordinate and/or administer the daily farm activities.
Rural Indigenous	
1. Pavencúl 2. Pinal 3. La Patria 4. Mario Souza 5. Villahermosa	These are located in the higher part of the municipality, between 800 and 2200 meters above sea level. Pavencúl and Pinal are located on the border with Guatemala on the slopes of Volcán Tacaná and more than 95% of their inhabitants are of Mam-Quiche background. The other three communities are between the first two and the city, their inhabitants are, «generally» indigenous peasants coming from the first 2 communities. There are some families with members of mestizo origin (a minority). Those of indigenous origin hardly speak their native tongue. A majority are owners of small plots of land where they cultivate coffee and they conserve it themselves. Others, who are poorer and without land contract out to the former group and/or tot he larger farms during the harvest and clearing seasons.

Figure 2. Proportion of Women without Schooling by Age Groups at the Time of the Survey and Socio-cultural Context

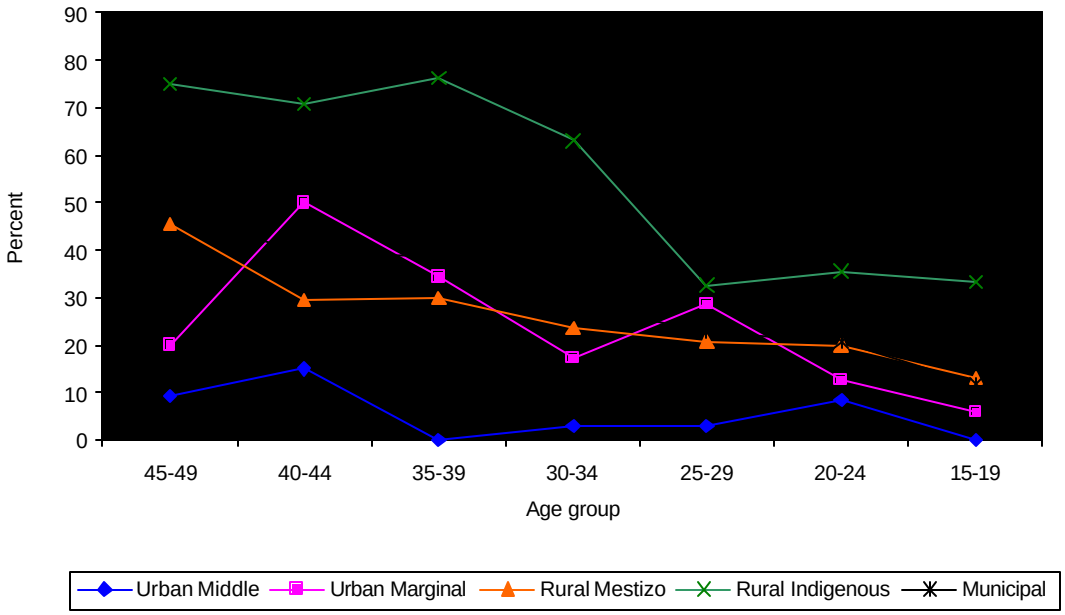


Figure 3. Reproductive Behavior by Socio-cultural Context

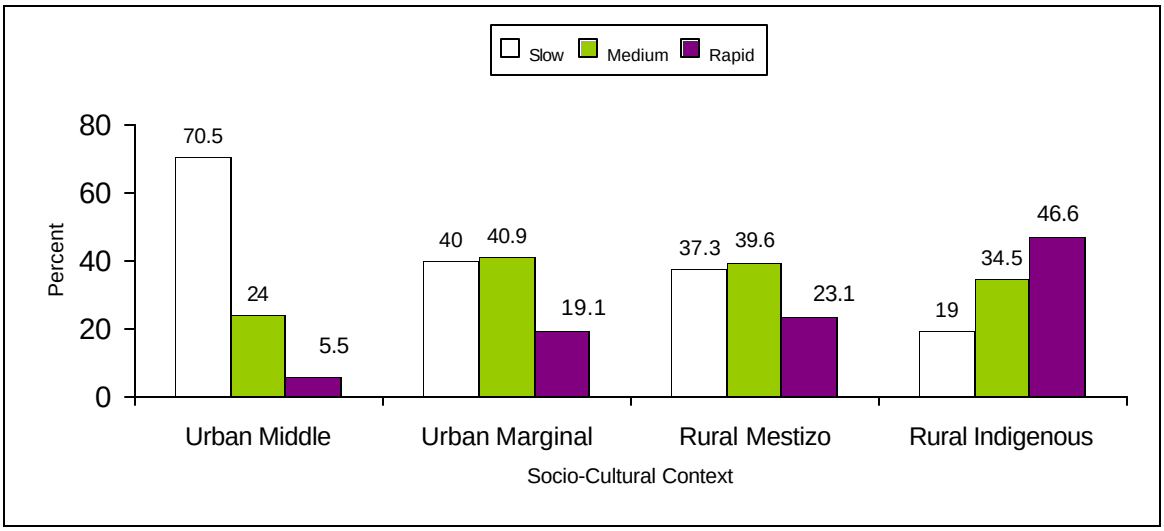


Table 3. Reproductive Behavior by Settlement

Communities	No. of women in union or ever in union with complete data	Rapid	Medium	Slow
Urban middle	**146**	**5.5**	**24.0**	**70.5**
San Caralampio	35	8.6	17.1	74.3
16 de septiembre	48	10.4	31.3	58.3
Barrio nuevo	24	--	33.3	66.7
Laureles	4	--	25.0	*75.0*
Tapachula center	35	--	14.3	85.7
Urban marginal	**230**	**19.1**	**40.9**	**40.0**
San Benito Abad	284	26.2	39.3	34.5
Colinas del Rey	231	12.6	41.4	46.0
La Gloria	185	18.6	42.4	39.0
Rural mestizo	**308**	**23.1**	**39.6**	**37.3**
La Cigüeña	48	29.2	39.6	31.3
Joaquín M. Gutiérrez	77	19.5	45.5	35.1
Conquista Campesina	51	43.1	37.3	19.6
Carrillo Puerto	124	15.3	37.9	46.8
San Nicolás	4	25.0	--	75.0
Perú-Paris	4	--	50.0	50.0
Rural indígenous	**232**	**46.6**	**34.5**	**19.0**
Pavencúl	76	51.3	32.9	15.8
Pinal	56	55.4	30.4	14.3
La Patria	31	54.8	22.6	22.6
Mario Souza	42	33.3	35.7	31.0
Villahermosa	27	25.9	59.3	14.8
Tapachula	916	25.2	36.1	38.6

Communities	No. of women in union or ever in union with complete data	Rapid	Medium	Slow
Urban middle Tapachula center				
Urban marginal				
Rural mestizo				
Rural indigenous				

Table 4. Formal Education of the Couple and Reproductive Behavior

(Overall data).

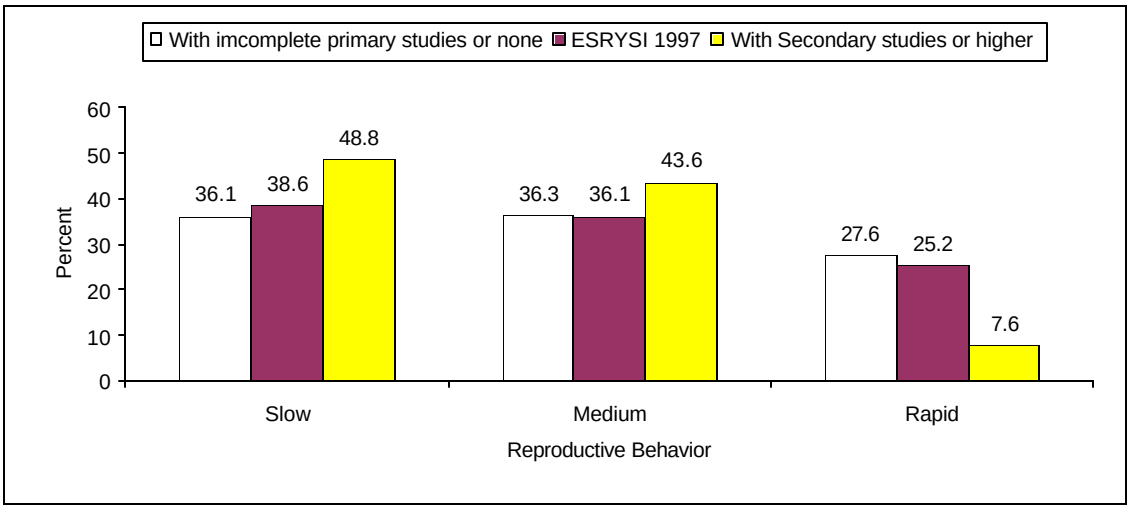
Determinants	Percentage of reproductive behavior				Statistics		
	n'	*Rapid*	*Medium*	*Slow*	$?^2_{LR}$	*d.f.*	*p- value (?)*
Total	**916**	**25.2**	**36.1**	**38.6**	--	--	--
Respondent's schooling (primary complete versus primary incomplete or none)	118	14.4	44.9	40.7	10.1	2	0.006
Respondent's schooling (secondary complete or higher versus primary incomplete or none)	223	2.2	29.1	68.6	156.5	2	0.000
Spouse's schooling (primary complete versus primary incomplete or none)	226	27.9	43.4	28.8	13.1	2	0.001
Spouse's schooling (secondary complete or higher versus primary incomplete or none)	112	8.9	33.9	57.1	27.5	2	0.000

Note: In this case the variables are dichotomic (0,1), where the presence of the characteristic is unity, *n'* is the number of women that possess the characteristic central to the variable.

d.f. degree free
n´ simple size
$?^2_{LR}$ =Chi-Square of Likelihood Ratio

	Percentage of reproductive behavior		Statistics	
Determinants	n' Rapid Medium	Slow	$?_{lr}$	Value of a
Respondent's schooling (primary complete versus primary incomplete or none				
Respondent's schooling (secondary complete or higher versus primary incomplete or none)				
Spouse's schooling (primary complete versus primary incomplete or none)				
Spouse's schooling (secondary complete or higher versus primary incomplete or none)				

Figure 4. Reproductive Behavior Predicted for Women Without Schooling or with Incomplete Primary versus Women with Secondary or More

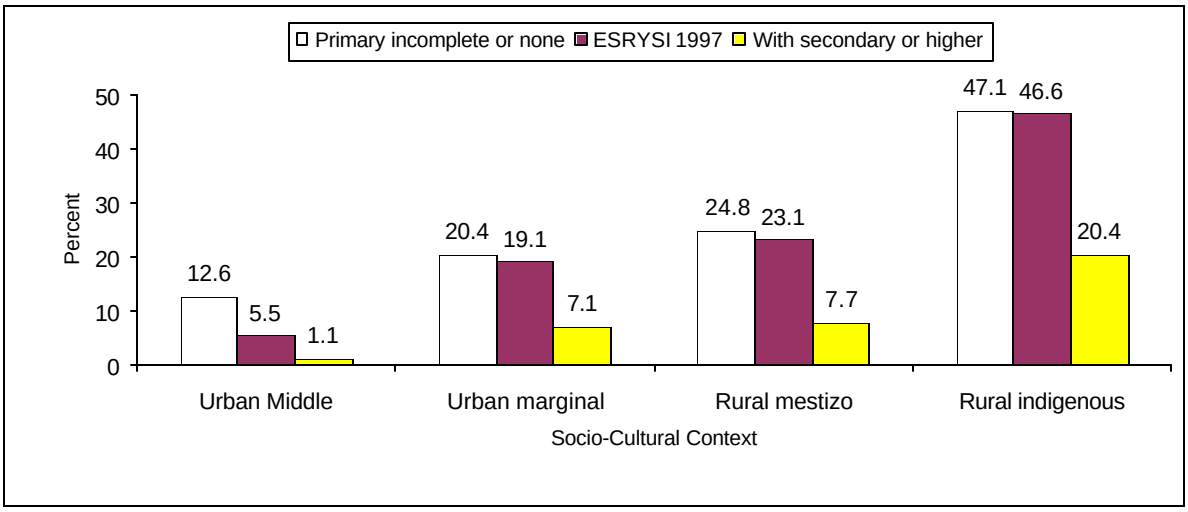


With incomplete primary studies or none
ESRYSI 1997 (observed)
ESRYSI (Survey on Reproductive Health and Infant Survival, observed)
With secondary studies or higher

Prevalence (%) of RB

Slow RB
Medium RB
Rapid RB

Figure 5. Impact of Formal Education by Socio-cultural Context



Primary incomplete or none
ESRYSI 1997 (observed)
ESRYSI (Survey on Reproductive Health and Infant Survival, observed)
With secondary or higher

Prevalence (%) of RB