Fertility and Migration: a proximate determinants analysis in the case of Baja California, Mexico.

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ABSTRACT

Previous studies have suggested four hypotheses regarding the outcomes in the migration-fertility relation (i.e. 'socialization', 'adaptation', 'selectivity', and 'disruption' effects). However, there has been a lack of attention to the intervening mechanisms that help to understand the interaction between social factors and the reproductive patterns of migrants, and that has led to contradictory findings. In this thesis a Proximate Determinants approach is used as the appropriate analytical framework to elucidate the interaction between geographical mobility and reproductive behaviour, and its macro-demographic policy implications. This framework is used to analyze the reproductive behaviour of the migrant and native groups of Baja California, Mexico. The main data source used for this analysis is the 1986 Baja California Demographic Survey (BCDS), which was based on a probability self-weighted multi-stage household sample, selected from four independent Municipal sampling frames.

In relation to those groups of the population of Baja California, the two main findings of this study are:

i) patterns of marriage, contraceptive use and effectiveness, and the practise of breast-feeding amongst the native group seem to reflect a more 'modernized' attitude toward fertility behaviour, since in relation to the migrant group, lower proportions marry and they marry at older ages; higher proportions use contraception, and; fewer breast-feed and for shorter periods than their migrant counterparts, and;

ii) regardless of birth-cohort, migrant women who spend their formative period in a rural environment, are more likely to achieve 'high' marital cumulative-fertility than native women in the same birth-cohort who spent their formative period in a urban setting and, furthermore, after controlling for education there is no evidence that within a given birth-cohort, migrants with longer periods of exposure are more likely to have 'low' marital cumulative-fertility than women of the same age who had shorter exposure periods to the new socio-economic environment.

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TO LAURA, LAURA GABRIELA, AND MARINA.

INTRODUCTION

During the last decade there has been a growing realization amongst academic and official communities interested in population issues that, if during the 1970s population growth was the issue in most of the developing countries, population distribution and mobility would be the issues from the 1980s onwards (U.N.:1984).

In the case of Latin America, for instance, during the late 1970s the International Review Group of Social Science Research on Population and Development (IRG) found that, "while the development plans of the majority of Latin American governments include population redistribution as a problem to be solved, relatively few have implemented specific policies related to population distribution" (Miro & Potter: 1980;52).

One recommendation, amongst others, that the IRG suggested in order to help in the formulation and implementation of specific policies related to population distribution, was that of orienting the research agenda in such a way that it would help to fulfil "the lack of detailed information on the size and the character of the migration flows taking place...(as well as the)...need for additional knowledge on the consequences of migration" (Ibid;129).

Within the context of Latin America, Mexico's current national spatial population distribution policy is "to reduce migration to major metropolitan regions and the other urban centres, and to decrease rural out-migration....In 1978, a regional demographic plan was adopted. It aims to adjust spatial distribution by retaining population in certain areas and channelling migration to new receiving areas, ensuring that no state grew by more than 4.5 per cent annually. One objective was to decrease the growth of the Federal District (by relocating public employees), Monterrey and the border cities in the region of Baja California Norte (sic)" (U.N.: 1989;177).

In combination, the awareness about the issues and problems concerning population distribution and mobility, the lack of geographically detailed information on the volume and consequences of internal migration, and the stated objective of Mexico's regional demographic plan, allowed us to participate in coordinate a multidisciplinary and inter-institutional research group, whose main task was to implement the 1986 Baja California Demographic Survey (BCDS).

The main objective of the 1986 BCDS was to measure - at the state and municipal level - the magnitude of the temporary, permanent, internal and international migration flows, to and from Baja California (see, Figure 2.1.1 for the location of Baja California). Having achieved that initial aim (see; CONEPO-BC, CRIM-UNAM & IIS-UABC:1987), and taking into consideration the specific objective that Mexico's regional demographic plan has defined for Baja California, in this study - using that same data source - we propose to begin the assessment of the demographic consequences of migration for Baja California, by addressing and analyzing the issue of the fertility-migration relationship.

Therefore, we have set as the central aim of this thesis that of the evaluation of the reproductive patterns of the population of the state of Baja California, Mexico. Furthermore, based on the premise that from a demographic point of view the key question posited by the relationship between migration and fertility is whether there is a differential reproductive pattern between territorially mobile and non-mobile populations, and on the fact that the state of Baja California has been one of the major destination points for a substantial amount of the internal population movements within Mexico as a whole[1], <u>the basic general objective of this thesis can be stated as that of assessing the reproductive patterns of both the native and migrant</u>

1.- See Section 2.1.1 for a detailed account of this process of inmigration to Baja California.

<u>population of the state of Baja California, in order to establish whether or not there are significant fertility-behaviour differences between those two sub-groups of the state's population, and if there are such differences to identify the likely demographic implications for the state as a whole.</u>

In order to achieve that general aim, and <u>based on a definition of **non-migrant or 'natives'** which only includes those women who were born in Baja California and have never changed their place (i.e. town) of residence</u>, we have also defined five specific objectives to be reached through this thesis, and those can be best stated as a set of interrelated questions as follows:

i) Regardless of the existence, or not, of clear differences between the reproductive behaviour of the native and migrant groups, there still remain to be answered the questions of; which demographic mechanisms lie behind the similarities/differences in the fertility patterns of these two socially differentiated groups; and, what is the relative importance of those mechanisms in explaining the differences/similarities in reproductive patterns of those two sub-groups of the population?

ii) Once the demographic mechanisms have been identified and their ranking has been established, there is the need to ascertain which socio-economic and cultural factors can be associated with those 'levers' that help in explaining the differences/similarities between the fertility behaviour of migrants and natives in the state? Furthermore, what is the direction and the magnitude of the effects of specific socio-economic characteristics upon the relevant demographic mechanisms that explain the reproductive behaviour of those groups?

iii) Whatever the outcome of the comparison between the reproductive patterns of migrants and natives, but especially in the case that there are significant fertility differences between those groups, there is the requirement of a definition of which are the likely demographic trends that can be expected to stem from the current population composition?

iv) Based on the knowledge of the current state and expected trends of the reproductive performance of the native and migrant population, a further point to be addressed is that of what are the demographically-oriented policy recommendations that can be derived from that information? And, last but not least;

v) What relevant theoretical and methodological contributions can be derived from the analysis of the observed relationship between migration and fertility in Baja California?

To identify both the possible demographic outcomes of the migration-fertility relationship, and the most appropriate analytical and methodological approach to study that relationship, Chapter I of this thesis contains a review of the empirical findings that have been documented for the four major demographic hypotheses associated with the migration-fertility relation[2].

Based on the methodological experience and empirical results that have been reported in the reviewed studies, in the second section of the chapter we elaborate the contention that the analytical framework of the Intermediate Fertility Variables, and the quantitative approach of the Bongaarts' Proximate Determinants model are the appropriate means of assessment for the purpose of comparative fertility research, and thus their key concepts and assumptions are presented and described.

2.- It should be noted that some of the material included in Chapter I, is based in part on a literature review presented as a dissertation for the M.Sc. degree in Demography. See, Estrella:1989.

The demographic and socio-economic context in which we analyze the relationship between migration and fertility, is presented in Chapter II. After characterizing Mexico's 20th century national and regional population processes in the first section, we describe the past trends, patterns, and levels of the demographic variables of Baja California in the second section. The third and final section of the chapter, includes an evaluation of the relative degree of the socio-economic development that the north of Mexico in general, and the state of Baja California in particular have achieved, and we conclude the chapter by highlighting the demographic implications that have been recently observed in the state in terms of the relation between socio-economic development and mortality, fertility, and migration.

Having described the social and economic context in which the relation between migration and fertility has been developing in Baja California, in Chapter III we address two central issues regarding that relationship. The first one is the analysis of the current reproductive behaviour of the native and migrant groups of the population of the state, by means of the application of the 'intermediate fertility variables' approach in its version of the Bongaarts' 'proximate determinants' model. From that analysis, which is presented in the first section of the chapter, we seek to identify not only the main differences between the fertility patterns of those two groups, but also the underlying demographic mechanisms that explain the observed patterns of reproductive behaviour.

Once we have analyzed the magnitude of the effects of the proximate determinants upon the fertility of the native and migrant populations, and the composition of the differences between the fertility rates of those groups, in the second section of the chapter we address the issue of the analysis of the 'remote' or socio-economic factors which are expected to affect, in turn, the patterns of reproductive behaviour which are accounted for by the proximate determinants of fertility. After identifying in the literature and in our data source the relevant and available socio-economic factors, in this analysis we use Log-linear techniques to fit three models that allow us to estimate the migrant and non-migrant groups relative chances of being within marital union; for those within marriage, of using contraceptive methods, and; of breast-feeding their last live birth.

Based on the documented evidence reported in the literature review, and also on one of the general findings presented in Chapter III (i.e. the presence of 'type of place of residence' effects that seem to explain the different marriage and contraception patterns of behaviour between the native and migrant groups), we decided to empirically test - with the data from the 1986 BCDS - the two relevant demographic hypotheses regarding the relationship between migration and fertility for the case of Baja California; i.e. those which take into account the socialization and adaptation effects on migrants' fertility.

In order to do so, using again Log-linear models, in Chapter IV we review and take into account the reported experience in the operationalization of the socialization and adaptation hypotheses for the purpose of the analysis of the migration-fertility relationship, and then proceed to test for the presence of the place-effects upon the cumulated fertility of five successive birth-cohorts of rural-socialized migrants and urban-socialized natives, as well as amongst migrants with different lengths of exposure to the socio-economic environment of the receiving area.

Finally, after a summary review of our main findings, Chapter V includes the main theoretical, methodological, and policy implications that we contend can be derived from both the empirical results, and from our suggested analytical approach to the fertility-migration relationship.

I.- RESEARCH OBJECT.

The central purpose of the initial section of this chapter is to present a review of selected studies dealing with the relation between migration and fertility. This review illustrates the main hypotheses that have driven demographic research in this topic, and presents a description of the underlying methodologies, measurement techniques, suggested approaches, and recommendations presented in the studies reviewed.

The review contains a chronological description on the emergence, and evolution of the four central hypotheses regarding the possible outcomes in the migration-fertility relation. Briefly stated, the hypotheses concentrate on; (a) the effects of migrants' place of upbringing or of socialization on their fertility preferences after migration to new settings; (b) the ability of migrants to assimilate their reproductive patterns with those prevailing in their adopted environment; (c) the effects of migrant selectivity in relation to demographic and socio-economic characteristics, both positive and negative, on migrants' reproductive behaviour before and after migration; and, (d) the effects of physical separation or disruption on the reproductive career of migrants, due to the migration process itself. From this review, in subsection 1.1.6 we derive and present the central hypothesis that guides our study.

The second section of this chapter addresses the issues of both the analytical framework and the predominant methodological approaches that have been developed for the empirical assessment of the proximate determinants of fertility, and describes their basic features in order to underline the fact that these models could prove to be analytically rewarding when attempting to explain the relation between migration and fertility, since they incorporate the kind of basic demographic factors that have been observed to underlie the differences in reproductive patterns between various groups.

Before the main body of the first section is presented, there are a couple of cautionary notes relating to its limitations. First, it should be noted that the review is confined to those studies which deal exclusively with internal migration. Within this limited context, special consideration has been given to those analyses that deal with the fertility behaviour of migrants in the place of destination, rather than the effects of migration on the fertility at place of origin.

Also, secondly, at this point it should be mentioned that henceforth - unless otherwise noted - we will be using the concept of 'migrants' in reference to persons moving within a country (i.e. internal migration) and 'in/out-migrants' to persons moving into/out of destination/origin areas within a country. These definitions allow us to differentiate these terms from terms such as 'emigrant' and 'immigrant' which refer to persons moving between countries (see; Shryock, Siegel, et.al.:1976;374).

1.1.- Fertility and Migration.

1.1.1.- Migration effects on fertility.

The relationship between migration and fertility has been analyzed from several social scientific approaches, and for a number of different reasons. For instance, economists have looked at the effects that industrialization has had on the reproductive patterns of migrant populations, since the former is supposed to involve a transformation of the contextual conditions determining the 'utility' of a given family size (Lee & Farber:1984).

In a similar although more general approach, sociologists have emphasized the on-going process of modernization with its individualizing, secularizing, and rationalizing tendencies, in their pursuit of an explanation for the contrasting fertility behaviour among movers and stayers within a population (Martine:1975).

For demography, the question posited by the relation between migration and fertility is whether there is a different fertility pattern between territorially mobile and non-mobile populations, and if there is such a differential, which demographic factors may explain it? In this field historical demography has been limited in its contribution, mainly due to the well-known fact that demographic-event reconstitution for migrant populations is close to impossible once the individuals leave their original place of residence. Historical studies, with very few exceptions[3], have tended to focus on the analysis of the effects of migration on the fertility of the population in the place of origin; for example, as a way for explaining low levels of fertility in rural-traditional and backward areas (Van De Walle:1975).

A more rewarding line of demographic research into the relation between migration and fertility has been those analyses dealing with the demographic behaviour of immigrants. In this area of research a good deal of attention has been devoted to the fertility patterns of international migrants in the post World War II period, and to its effect on the receiving population in countries such as Australia (Day: 1971. Ware:1975), Israel (Friedlander:1975), Britain (Waterhouse & Brabban:1964), and the United States of America (Gibson:1975), to name only a few.

On the specific topic of internal migration and its relation to fertility patterns, which is the focus of our literature review, there have been several studies with different analytical purposes, methodological scope and theoretical contributions. In relation to the latter, for instance, several studies of fertility differentials between urban and rural populations, and between migrant and

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3.- A recent example of a historical demography study that compares the reproductive behavior between foreign and native-born women without encountering the usual problems of demographic events reconstitution can be found in; Bean, Mineau, & Anderton, (1990).

non-migrant groups, have suggested that particular findings on a given country deserve generalization to most of the developing countries, and therefore calls have been made for appropriate amendments to demographic transition theory (Abu-Lughod:1964. Zarate,A.O.:1967a).

Still within demography, a further although less ambitious approach to the fertility-migration relation, has been the assessment of the direct and indirect contribution of migration to urban growth in the context of the un-precedented urbanization rates of the developing countries (Arriaga:1968. Alberts:1977).

A third and final approach is concerned with fertility differentials between urban and rural populations. The relevance of fertility differentials to our purposes is twofold. On the one hand, differential fertility of urban and rural populations - and among subgroups within those areas - has been observed to play a key role at the onset and development of the fertility transition process in the now-developed countries (Rider:1959), and since such differentials in reproductive patterns are still very much present in the developing countries (Singh, et.al.:1985), it is expected that through such analysis, the demographic paths of the latter countries could be better understood.

Incorporation of inmigration in the explanation of the inverse relationship between socio-economic status and fertility among the urban resident population, on the other hand, led to one of the main demographic hypothesis regarding the relation between migration and fertility; the socialization hypothesis. The socialization hypothesis assumes that the reproductive performance of migrants reflects the fertility preferences prevalent in their childhood environment (see subsection 1.1.2 for references). Therefore, convergence in the fertility level of migrants toward those of the receiving population could only be expected after at least a generation has elapsed.

A similar approach which takes account of intra-cohort fertility differentials among migrants at the place of destination, is the adaptation hypothesis (see subsection 1.1.3 for references) which assumes that the fertility patterns of migrants gradually adapt to the new economic, social, and cultural environments at place of destination, and therefore it is expected that eventually - as their exposure to the new settings increase - their fertility level will resemble or be equal to that of the receiving population.

A further possibility that has been empirically tested (see subsection 1.1.4 for references) is that migrants are a selected group. The selectivity hypothesis focuses on the known fact that migrants are not a random sample of the population at their place of origin in terms of age, education, and marital status among other characteristics and that, therefore, they should be expected to possess fertility preferences different from those of the overall population at place of origin.

The foregoing hypotheses basically relate to the effects of place of origin and/or place of destination on fertility. The last hypothesis to be considered in this review is that which deals with the effects on fertility due to migration itself. The disruption hypothesis (see subsection 1.1.5 for references), suggests that by the mere fact of mobility migrants become exposed to factors affecting both the 'tempo' and 'quantum' of their fertility. The disruption hypothesis, therefore, assumes that immediately after migration, migrants' fertility would be particularly low (especially due to temporary spousal separation) which in turn would give way in time to the readoption of a more normal, or even accelerated pace in their fertility pattern.

In what follows a chronological and descriptive review of studies related to these four hypotheses will be presentedin this document, benefiting from previous efforts reported by Myers & Macisco, (1975) and by Zarate,A.O. & Zarate,A.U.(1975) . The central aim of such a presentation is to generate a general overview of the main qualitative findings that have substantiated these four hypotheses, and to derive potentially research-oriented conclusions.

1.1.2.- Socialization.

The earliest efforts that we have been able to document in relation to the socialization hypothesis are the ones presented by Kantner & Whelpton, (1952), and by Freedman & Sharp, (1954). In the study based on the Indianapolis Household Survey, Kantner & Whelpton tried to substantiate the proposition that high fertility preferences and ineffective family planning patterns formed in the rural community will survive the migration process, but the evidence suggested otherwise. A couple of years later, working with data on 'ideal family size' from the Detroit metropolitan area Freedman & Sharp found that a general, although not statistically significant, trend which indicated that the 'ideal' size differences based on education and age could mainly be the result of rural background or, in other words, that a completely urban background tended to reduce the differential based on age or education.

By the end of the 1950s, the socialization hypothesis underwent one of the most celebrated tests in the literature as Goldberg, (1959) analyzed a sample of 1,514 married couples from Detroit, in order to see if the assumed inverse relationship between socio-economic status and fertility prevailed among the 'two-generation urbanites'; i.e. defined as those couples without, both husband's father's rural occupation, and direct residential farm background of the couples. The central proposition that Goldberg tested was that the inverse pattern, so frequently observed in urban areas was a function of the differential selectivity of status categories for farm migrants. He measured fertility by children ever born to women 40 years of age and over, and after controlling for such factors as occupation of head of the household, income level, wife's educational attainment, religion, and farm background, he found that for Detroit "the inverse pattern that has always been found can be attributed primarily to the fertility behaviour of rural migrant families and their disproportionate representation in the lower status groups" (Goldberg:1959;216).

In a further and related study, while working with the Indianapolis Household Survey, Goldberg, (1960) again was able to substantiate the socialization hypothesis, and in order to explain the inverse relationship between socio-economic status and fertility that had been observed both in Detroit and in Indianapolis for the migrant farm background populations, he posited that their lack of skill to upgrade their socio-economic status within the urban context - and therefore to adopt the small family size norms - was linked to the formative period in their place of origin, which failed to provide them with the required abilities to achieve upward social mobility (Goldberg:1960).

During the 1960s the socialization hypothesis was extended to the national level within the United States of America, and to the international level in the context of the urbanization process of the developing countries. In the former case both Freedman & Slesinger,(1961), and Duncan, (1965) applied the hypothesis to two national representative samples of the Growth of American Families Study, and the 1962 Current Population Survey, respectively. These two studies replicated Goldberg's definitions and measures of fertility, but benefiting from larger samples and more detailed information were able to control for a wider range of variables, and also - especially in the case of Duncan - to apply far more elaborate methodologies in the data analysis.

Perhaps due to these advantages, it should not come as a surprise that both of these studies, while supportive of Goldberg's earliest findings, called attention toward some qualifying evidence regarding the socialization hypothesis. In the case of the Freedman & Slesinger, (1961) study, a note of caution was posited as they tried to explain the weaker differentiation - in relation to that measured by Goldberg - between the farm and nonfarm background component of fertility, by suggesting that they may have been "studying the effects of farm migration on fertility differentials when the influence was growing quite small" (Freedman & Slesinger:1961; 173). On a very similar note, and based on the analysis of the cohorts born between 1900 and 1915, Duncan stated that in the foreseeable future "the combination of factors apparently necessary to produce high fertility, low educational attainment and farm background, will characterize an ever smaller fraction of women" (Duncan:1965;249).

The second set of tests that the socialization hypothesis underwent during the 1960s are those reported in the literature for the cases of India, Argentina, and Mexico. In his analysis of fertility differentials in Bombay, El-Badry, (1967) did not set out to test the hypothesis explicitly, but when trying to explain the consistent increase of age standardized average parity by husband's place of birth with the increase in duration to urban exposure - measured as duration of husband's residence in the city - he noted that such a trend could mean relatively higher fertility in the in-migration area (possibly due to an improvement in living conditions unaccompanied by family planing), or a tendency for migrants to have smaller families at the time of migration than their counterparts in the city. However, he concluded that "within the urban area of Greater Bombay the population was unassimilated and settled according to ethnic groups" (El-Badry:1967;640).

The crude nature of the fertility measures employed in the studies of Buenos Aires and Mexico City - average number of children ever born - and the absence of basic controls for comparison of fertility behaviour between migrants and urban natives, must be taken into account in considering the findings reported by Brito, (1969). He noted that in spite of the fact that each of the cities seem to be undergoing very different stages of the demographic transition - Buenos Aires in the last stage of fertility transition, and

Mexico City about to start the onset of fertility decline - both showed an inverse relationship between socio-economic status and fertility for both nonmigrant and migrant women to the urban areas, and that in the latter case, the highest fertility was observed for those with rural residence background.

This result provided further confirmation to the findings previously reported by Miro, (1966) with regard to the fact that in the seven cities covered by the Program of Comparative Fertility Surveys of CELADE (Bogota, Buenos Aires, Caracas, Mexico City, Panama, Rio de Janeiro, and San Jose de Costa Rica), the differentials recorded leave no doubt that the reproductive behaviour of women born in the cities resulted in persistently lower average numbers of live births (Miro: 1966).

During this period, working with the same data from which Zarate, A.O. (1967b) had earlier reported an inverse relationship between mean number of live births to male respondents and size of place of birth for inmigrants to the metropolitan area of Monterrey, Mexico, Browning & Feindt, (1968) set out to test the hypothesis that as the time of exposure to the urban environment increased, the socio-economic status of migrants should be expected to be higher. After analyzing the educational, occupational, income, and housing characteristics for five categories of length of exposure, they concluded that their findings suggested that the adaptation of the migrants to the socio-economic structure of the city, was a long and slow process which required at least two generations (Browning & Feindt: 1968).

The latest wide-ranging test of the socialization hypothesis that we have been able to document for the United States of America is that reported by McGirr & Hirschman, (1979). This analysis of completed fertility from three different national samples, and for four successive birth-cohorts ranging from 1911 to 1935, addresses the questions of whether there were socio-economic differences in completed fertility among urbanites without farm background, and whether such a relationship had changed across birth cohorts.

The findings reported by McGirr & Hirschman were supportive of Goldberg's findings when dealing with the same cohort analyzed by the latter. But in the case of subsequent cohorts McGirr & Hirschman found that the inverse relationship between socio-economic status and fertility, although of lesser magnitude, remained for both farm and nonfarm background women, and therefore they concluded that their "findings indicated a shift in the relationship between farm-background, education, and fertility across birth cohorts of American women" (McGirr & Hirschman:1979;34). Such a conclusion, corroborated partial evidence previously reported by Ritchey & Stokes, (1971) in regard to the shift in the relationship between fertility and residential background among different birth-cohorts.

1.1.3.- Adaptation.

As stated above, a parallel development to the socialization hypothesis is that which assumes a gradual process of adaptation of the migrant to the place of destination. Such a process, in turn, is supposed eventually to lead to the migrant adoption of the reproductive norms and behaviour of the receiving population. The evidence that we have been able to document in support of the adaptation hypothesis covers a period ranging from the early 1960s to the mid 1980s, and relates to the developing countries of Central and South America, and of South East Asia.

Beginning with the studies of the Americas, the earliest reported evidence for the adaptation hypothesis is that presented by Hutchinson, (1961) for eight cities from the industrialized South Eastern region of Brazil, based on a 1959-1960 sample survey of 2,224 men and women married for ten years or more, for whom fertility was measured by mean family size.

Initially Hutchinson's aim was to test the proposition that among two-generation urbanites social mobility - measured as movement between manual and nonmanual occupations - had little effect on completed family size. However, while he found no support for the expected absence of a relation between social mobility and the fertility of the urban born, he also found that among rural to urban migrants the inverse relationship between socio-economic status and fertility was evident and, furthermore, that those migrants falling to manual status had a mean family size greater than their class of origin, while migrants rising to nonmanual occupations had smaller family sizes. On this basis, with regard to the fertility of the rural-born migrants in Brazil, Hutchinson was able to conclude that "if urban migration is followed or accompanied by a rise in socio-economic status, fertility tends to fall" (Hutchinson:1961;189).

By the early 1970s, working with the same survey data that Hutchinson used in his study, but restricting the sample to male respondents (1,280 in total) from six of the original eight cities included in the survey, Iutaka, et.al. (1971) used a multiple regression analysis to test the proposition that migrants would change their fertility patterns once they have settled in the urban centres, and that the 'model' of fertility that they adopt would depend both on the 'degree of urbanism' - measured as city-size - of the place of destination, and on the social-class background, achieved socio-economic status, and demographic characteristics of the migrants.

The results obtained in this study, show that for the whole sample the best four predictors of fertility were age, age at marriage, size of city, and migratory status. Once the analysis was restricted to migrants, age at marriage increased its predictive significance, indicating the possibility of differential marriage and fertility patterns for the migrants in that migrants may marry earlier than urban natives. It was also found that the type of community in which migrants were born did not discriminate among migrants, a fact from which the authors were able to propose that "the important factor is not the place were the individual was born but rather the amount of time they have spent in the city... The earlier (the age at which) migrants come to the city the more they are able to absorb urban values. The data presented suggests that fertility patterns can be changed in one generation although the 'urban model' of fertility is not exactly attained by the migrants themselves" (Iutaka, et.al.: 1971; 61).

The third study for the Americas is the one presented by Martine, (1975), which is based on the CELADE Program of Comparative Fertility Surveys (1963-1964) data for Bogota Colombia, Buenos Aires Argentina, and San Jose de Costa Rica. At that point in time, the information previously used by Miro, (1966) and by Brito, (1969) was available in more detailed form, allowing control for variables such as age, age at marriage, and union duration among others. With this refined data set, Martine tested the propositions that as length of time of residence increases, the lesser the differences in fertility between migrants and nonmigrants would be, and that the earlier the age of arrival in the city, the more complete the migrants' socialization and, therefore, the greater the similarity between the fertility patterns of natives and migrants.

Martine's findings, based on fertility measured as children-ever-born, standardized for duration of marriage and controlled by age at arrival for migrants, did not refute previous evidence of the relationship between place of birth and fertility behaviour, but at the same time allowed him to show that for the three cities studied, the duration of urban socialization or the early age at which it began appear to be of less significance for migrant fertility than the life stage in which the migrants moved into the city. Therefore he suggested that "perhaps the most plausible hypothesis would be that women who migrated when aged 15 to 24 tend to have a much greater proportion of their numbers arriving alone, while the great majority of migrants who arrived before the age of 15 come with their parents, and maybe women who arrived when aged 25 or more were already married" (Martine:1975;187). In other words, Martine proposed that the migrants' adaptation appeared to be affected at least as much by the life-stage at which migration took place as by the length of the period of urban-exposure or the rural-urban nature of migrants' residence history.

The two studies that we have been able to document for South East Asia have been reported by Lee & Farber, (1984) and by Farber & Lee, (1984), and both are based on a sub-sample of the data collected in the Korean World Fertility Survey of 1974. The central aim of these two studies was to isolate and assess the adaptation effect of migrants' fertility behaviour, from the possible confounding influences of migrants' selectivity at place of origin.

In the first study Lee and Farber developed a fertility model for the purpose of comparing the fertility pattern of migrants after migration, with that of a control group of rural nonmigrants which had a fertility pattern similar to that of migrants up to the time of migration. In other words, the model allowed them to test the hypothesis that "a rural-urban migrant has fewer additional births after migration within each five-year period after migration than a comparable rural-stayer when previous fertility levels are controlled" (Lee & Farber:1984;144). In this case the results showed that the fertility rates of rural-urban migrants fell below those of comparable rural nonmigrants after migration to an urban area, and that, while the fertility reduction occurred sooner among the recent migrants than among earlier migrants, the decline persisted as the duration of urban residence increased.

The main difference between the first and the second study of the Korean data, relates to the definition of the control group which is used to compare the fertility behaviour of migrants after migration. In their second study Farber and Lee's objective was to restrict further the possibility of selection, since in this case they assumed that the rural-urban migrants may have faced different biological and socio-economic constraints than nonmigrants even before migration.

Therefore, the design of the study was to divide migrants into two groups; one of which had already migrated by the time of observation, and a second group consisting of individuals who had not yet migrated but who were known to have migrated later (i.e. pre-migrants, and post-migrants, respectively). In order to eliminate possible differences in 'life-cycle solutions' between these two groups of migrants, controls were introduced for age, education, duration of marriage, and labour force participation.

Once these groups were defined, the proposition tested was that if the pre-migrant group had not migrated it would have had a fertility history similar to the post-migrant group, and that the difference between this fertility history and that of pre-migrants after migration would be an assessment of the adaptation effect. The results presented were that "the two paths were found to be significantly different, with migration slowing down the fertility rate of Korean (migrant) women" (Farber & Lee:1984;344).

1.1.4.- Selectivity.

The third hypothesis that has been submitted to empirical test with regard to the relation between migration and fertility, relates to 'place' effects of migration on fertility. The selectivity hypothesis assumes that migrants as a group possess a set of differentiating characteristics, both demographic and socio-economic in relation to the nonmigrant population at place of origin, and that this selective nature of migrants may explain their reproductive behaviour at their place of origin and at the place of destination. The evidence that has been reported in support of the selectivity hypothesis pertains mainly to the developing countries, and the limited information available for developed nations is scattered over time.

Beginning with the developed countries, we have been able to locate two related reports presented by Kiser, (1959 and 1963), which are mainly based upon the data from the United States of America Future Fertility of Two-child Families Surveys of 1957 and 1960. In order to set the context for the findings of the above mentioned surveys, Kiser reviewed data from the 1940 and 1950 National Censuses, and from other non-official surveys relating to the relation between migration and fertility.

The major findings from this data review were, first, that when using either child to woman ratios or total number of children ever born, both out-migrants and in-migrants had lower fertility than nonmigrants; and, second, that the only exception to that trend was that of the inmigrants from the South Central to the North Central States - who showed a higher fertility than nonmigrants. For this exception Kiser's suggestion was that this stream of migrants was weighted exceptionally by persons of rural origin, and low economic and educational attainment (Kiser:1959).

In contrast to that data, Kiser reported that based on the survey information the Protestant nonmigrant families reported lower fertility than migrants in the first survey interview (1957), and that "for all the religious groups the proportions of couples having one or more pregnancies within the three years after first interview was higher for those that moved than for couples that did not move...(and that the fact that)...migrants were characterized by relatively high fertility after the second birth (was) due in part to the lower proportion of family planners among the migrants" (Kiser:1963;172).

A second set of studies for North America are those reported by Long, (1970 and 1972). In the 1970 study Long used the 1960 National Census data of Canada and the United States of America, to analyze the fertility behaviour - age specific fertility rates based on children ever born to ever married women - of long distance migrants; migrants defined as those whose place of birth was different from place of current residence.

The two major findings of this study - concerning internal migration - were, first, that long distance migrants (between regions) in the USA and in Canada more often than not had fertility lower than nonmigrants in either region of origin or region of destination, and that this characteristic was more pronounced in the former than in the latter country, presumably because of the greater regional fertility differentials in Canada. Secondly, that migrants between regions within a country did not reflect the full range of variation in fertility presented by nonmigrant populations. In other words "that more agreement is found among long distance migrants as to family size than among nonmigrants (and that) this may be because migrants are of more uniform socio-economic status than are nonmigrants" (Long:1970;313-314).

In the case of the second study reported by Long, (1972) he set out to test the hypothesis that at each age, family heads with children only under the age of six have higher rates of geographic mobility than those with children aged 6 to 17 only, and those with children in both age groups fall in an intermediate position; and, finally, whether this suggestion applied equally to short (within counties) and long-distance (between counties) movement.

The data that Long used for this study was that of the 1968, 1969, and 1970 Current Population Surveys of the USA, and it showed that up to ages between 35 and 45 for household heads, the effect of school-age children was to restrict, both short- and long-distance mobility. Furthermore, Long found that regardless of age of children "family size and probability of moving within counties have a curvilinear relationship, while the probability of moving longer distances is inversely related to family size, at least up to age 35 of family head" (Long:1972;381). This latter finding, however, was further specified when dealing with 'atypical families' (i.e. those headed by women, spouse absent), for it was found that female family heads with children were more likely to have moved during the preceding 12 months than were male family heads, and that for these female-headed families the probability of moving long distances was inversely related to the number of children present.

The last study that we have been able to document for a developed country is that of Grundy, (1989) for England and Wales. Grundy's report refers to a longitudinal study based on a 1.1% sample of the population enumerated in the 1971 Census, which can be used both retrospectively - because the 1971 data included marital, fertility, and partial residential histories - and/or prospectively, since members of the sample were traced to link their records (post 1971) to the vital registration system and to the 1981 Census returns.

For the purpose of analyzing the relation between migration and fertility Grundy examined the information collected in the 1971 and 1981 censuses, and at birth registration between 1971 and 1980, and found that "long distance moves were associated with longer interval before the birth of the first or the second child than was the case among women not moving or only moving a short distance. This delay in first birth among recently married women was found to be associated with the higher educational level of long distance migrants. Thus the delay in births cannot be attributed to the effects of migration <u>per se</u>" (Grundy:1989;p.x).

Interestingly enough, this last finding reported by Grundy with regard to the selective nature of migration among the better educated in England and Wales, perhaps should be regarded as one of the most pervasive characteristics not only of the relation between migration and fertility but also of the general process of population mobility. In this regard, for instance, in a seminal paper on migration theory presented by Lee (1966) - based on the development of a simple but general schema which consists of four factors affecting the decision to migrate (migration defined as a permanent or semi-permanent change of residence), i.e. factors associated with the area of origin; factors associated with the area of destination; intervening obstacles; and, personal factors - it was suggested, amongst other hypotheses, that both the volume and the selective nature of migrants could be considered to be affected by education.

According to Lee's (1966) schema, the decision to migrate "results in part from a consideration (individual's perception) of positive and negative factors at origin and destination (Ibid;52), and the volume of those who take the decision to migrate varies - amongst other factors - with the diversity of people, which he argued is enhanced in modern societies through education, since "the aim of prolonged education is to generate specialists, for many of whom the demand is small in any one place but widespread...for them migration is a concomitant of their vocation"(Ibid;53).

Lee's (1966) proposal, furthermore, suggested that (within a general context in which migrants' education tends to be higher than that of non-migrants at place of origin, but lower than that of the population at place of destination; i.e. intermediate) the actual perception of the positive and negative factors both at place of origin and place of destination is closely associated with the educational characteristics of a person. In this regard he postulated the hypothesis that "migrants responding primarily to (positive) factors at destination tend to be positively selected.... ....because they perceive opportunities from afar" (Ibid;56).

These general proposals presented by Lee with regard to the selective nature of migrants according to education, also seem to be corroborated by the experience in the developing countries. In this case, returning to the relation between migration and fertility, as far back as twenty years ago Macisco & Bouvier, (1969) and Weller & Macisco, (1971) started reporting this relation between education, migration, and fertility.

In both these studies based on a 25.0% sample of ever married women derived from the 1960 Census of the Commonwealth of Puerto Rico, the authors found that wives of inmigrants to the San Juan metropolitan area - in the five years preceding the census - showed lower age specific fertility rates (for women aged between 14 and 34) after controlling for educational attainment, than those of the comparable nonmigrant urban population, and therefore concluded that the evidence indicated "that migration is selective of the young. The young, in turn, are better educated and may be adopting norms favouring lower family size. However, among the older migrants (35 years of age and more) no selectivity of the better educated occurs" (Macisco & Bouvier:1969;174). This suggested the possibility of two types of migration streams into the city which included the young, educated, and innovative generation, and the older, less well educated generation with more traditional values in regard to fertility behaviour.

This changing pattern of selectivity among migrant streams was also studied for the case of Mexico in the late 1960s by Browning & Feindt, (1969) who - as in the previously reviewed study worked with the data from which Zarate, A. O. (1967b) had earlier reported higher mean number of live births to male inmigrant respondents aged between 51 and 60 years in the metropolitan area of Monterrey, Mexico - set out to test the hypothesis of migrant selectivity and its changing nature over time. In order to do so they analyzed the socio-economic and demographic characteristics of three arrival-cohorts of migrants, and compared them with those of the population at place of origin.

In this study Browning and Feindt concluded that their evidence demonstrated that the migrants to Monterrey were both selected and positively so, especially in relation to educational attainment, but that the evidence also showed a decline in the degree of positive-selectivity of migrants, since the more recent arrival-cohorts included "declining proportions of males arriving single...more males arriving married and accompanied by children, and among the latter increasing proportions arriving with two children or more" (Browning & Feindt:1969;351-354).

These findings relating to the selective nature of the migration process in Latin America have been further substantiated during the late 1970s and 1980s. In the former case Alberts, (1977) using again the same data collected by the CELADE Program of Comparative Fertility Surveys of 1963-1964, while trying to explain the fact that migrant women reported lower, similar, or higher fertility levels than nonmigrant metropolitan women (i.e. in the cities of Santiago, Chile; Caracas, Venezuela; and, Lima, Peru; respectively) referred to the differential nature of selectivity according to marital status, and educational attainment among inmigrants to each of the metropolitan areas.

In that respect he found that in relation to marital status, migrants to Santiago and Caracas presented slightly higher proportions of single women, while single migrants to Lima were over-represented. At the same time he found that inmigrants to Santiago and Lima were highly selected on the grounds of education, but that the selectivity was diminishing over time, as seemed to have been the case for the inmigrants to Caracas where no educational selectivity remained at the time of the survey (Alberts:1977).

The two latest reports available in relation to the selectivity of migrants into metropolitan and urban areas of Mexico are those presented by Juarez, (1988) and by Brambila, (1985). The study by Juarez, which is based on the marriage, birth, and migration histories of a sample of 7,810 women (single or married between 20 and 50 years of age, and those aged between 15 and 19 married and with a live birth) collected on the 1976-1977 Mexican Fertility Survey (MFS), used a longitudinal dynamic analysis of the reciprocal effects between family formation events and migration, for the three decennial birth-cohorts within the period ranging from 1927 to 1956.

The available version of this study only reports on the analysis of the interactions between marriage and migration, and its main findings from the semi-parametric approach are; that the childhood place of socialization does not affect the probability of migration to metropolitan areas either before or after marriage for older cohorts, but for more recent periods it does increase the probability of migration for those socialized in urban areas; that for all cohorts, single people migrate more than married ones with a decreasing differential for younger cohorts; that ever-having a job, both before or after marriage, was positively associated with migration to metropolitan areas through all cohorts; that type of marital status loses significance with time; and, that women married to men who held a non-agricultural occupation at time of marriage tend to migrate more (Juarez:1988).

In the case of the selectivity of migrants to the urban areas, the study by Brambila, (1985) - who used the same data source as Juarez, (1988) but using multiple regression techniques - demonstrated that migration had the effect of increasing the age at marriage for rural to urban migrants; that the reduction of the number of children ever born to a woman was evident only for those women who moved to the cities before beginning their process of family formation; that the geographical destination of the migrant's movement within Mexico generated rather differentiated reproductive outcomes, since migration toward northern and central regions of the country had a positive effect in the age at marriage while the effect was negative amongst rural-destination migrants; and, that this regional-destination differential was also observed for rural inmigrants who had a significantly higher fertility than migrants to other areas. Therefore, he concluded that "the results from the MFS substantiate the hypothesis that migration is more advantageous amongst women who are selective-migrants, than amongst those who are non-selective" (Our translation. Brambila:1985;96).

The remaining reports in support of the selectivity hypothesis that we have been able to document refer to South East Asia and to North West Africa. In the case of the former the two studies reviewed, that of Hendershot, (1971) and that of Hiday, (1978) relate to the relationship between migration and fertility in the Philippines. The study by Hendershot tested the proposition that rural to urban migration is selective of persons with unusually high aspirations for social mobility, and while establishing that migrants had lower fertility - measured as mean number of children ever born standardized for age and duration of marriage - than urban natives, it was also found that "the more urban the destination of migrants, the more likely they were to possess traits usually associated with upward social mobility - high levels of education, higher income, and aspirations for more education or better jobs" (Hendershot: 1971;167).

In the second study for the Philippines case, Hiday used a sample of 3,082 reproductive histories of women 15 years of age and older, residing in two rural communities or elsewhere in the Philippines - using mothers as informants for their migrant daughters - which were collected in a household survey conducted during 1970. The purpose of the study was to analyze the effects of both migration and urban migration on fertility by comparing three groups of females; rural sedentary, rural migrants, and urban migrants.

Aside from the constant exception of urban migrants married in their teens, the four major findings reported were that, firstly, as expected women who migrated had higher educational levels than rural sedentary, and urban migrants were more educated than rural migrants; secondly, that mean age at marriage showed only slight differences among the three groups of women, but in the expected direction being the youngest for rural sedentary and the oldest for urban migrants; thirdly, that although child to woman ratios depicted a declining gradient of fertility from rural sedentary to urban migrant, the age-specific fertility rates (ASFR) while showing the highest fertility for rural sedentary women, also indicated that rural migrants' fertility was lower than that of urban migrants up to age 34 (but only up to age 24 for age-specific marital fertility rates (ASMFR)), and thereafter urban migrants' fertility fell below the fertility levels of rural migrants; and, fourthly, that urbanization appeared to have a negative effect on fertility independently of migration (Hiday:1978).

The last study reviewed for the selectivity hypothesis is that presented by Sabagh & Yim, (1980) for the case of Morocco. Their analysis of information from a sample of 2,952 ever-married women under age fifty - gathered in a KAP fertility survey carried out during 1966 in the nine largest cities of Morocco - was intended to test the proposition that changes in selectivity across migration streams could be explained as a function of both turning points in the socio-economic context, and of the changing nature of the migration streams in relation to their predominant places of origin and destination (i.e. rural to rural or rural to urban).

For the specific case of Morocco, Sabagh and Yim contend that when there was a heavy exodus from rural to urban areas, such a migration stream was not likely to be selective, and consequently, one could expect that rural to urban migrants would have fertility that was at least as high as that of urban nonmigrants; by contrast when persons born in urban areas move between cities, particularly during the post-independence period (1956 onwards), one could expect them to be oriented toward change and its related reproductive behaviour (Sabagh & Yim:1980).

As the authors resorted to an analysis of covariance and to a regression within migrant status categories, they were able to find, unexpectedly, that controlling for the effects of nine independent variables (length of residence in urban and/or rural areas, age at which residence began, age at marriage, income level, literacy, educational attainment, labour force participation, movie attendance, and ability to speak a foreign language) did not reduce the range in variation of fertility between migration categories, and more recent migrants still had the lowest fertility, although rural rather than urban migrants were the least fertile, whereas less recent rural migrants had the highest fertility (Ibid: 1980).

1.1.5.- Disruption.

The remaining studies to be reviewed here are those which offer some substantiating evidence for the disruption hypothesis, which basically assumes that by the mere fact of mobility migrants become exposed to factors that affect both the 'tempo' and 'quantum' of their fertility.

One of the earliest reports on the disruptive effects of the migration process could be found in a study presented by Browning and Feindt in the early 1970s. In this case the authors did not intended to actually measure the effects of migration per se upon fertility, but while analyzing the changing selectivity among migrant streams toward Monterrey's metropolitan area in Mexico, they were able to document that among the three main forms of migration (i.e. solitary, simultaneous, and split) the one that involved some form of separation between family members accounted for 42.0% of the total inmigration to Monterrey, and furthermore, that what was striking was "the considerable length of time that sometimes was needed to complete the split migration pattern..(since)..almost 44.0% required more than a year to bring the family together" (Browning & Feindt:1970;59).

A proper formal statement and empirical test of the effects of migration itself upon fertility could only be found for the first time in a report presented by Ritchey & Stokes, (1972). From their review of previous studies they were able to identify a source of conceptual confusion by noting that virtually all research had confounded comparisons of migrants and nonmigrants with residence background, and therefore they proposed to distinguish two separated issues; first, that migrants' fertility could be explained by previous and present residential experience; and, second, that migrants' fertility was also affected by the circumstances involved in migration itself.

In this study, therefore, Ritchey and Stokes tested the hypothesis that migrants have lower fertility than nonmigrants, by means of controlling for size of place of origin and of destination for migrants, and then comparing their fertility behaviour to that of the nonmigrant population (i.e. eliminating the 'place' effects, both of origin and destination, to isolate the migration effect on fertility). For the purpose of this analysis the authors used a restricted sub-sample of the National Survey of Economic Opportunity conducted by the U.S.A. Census Bureau in 1967, limiting the data to that of white couples, only once-married, non-foreign born, in which the husband was present and the wife was 20 to 44 years of age, and measuring fertility as the number of children ever born standardized for age.

The results that the authors reported - which were based on a definition of migrant that included all of those who had lived more than 50 miles away from their current place of residence as migrants - while affected by the small number of cases involved, indicated that "in conclusion, these data strongly suggest higher fertility among migrants than among nonmigrants...(but)..it has been established that migration and residence background do have an independent effect on fertility ..(although).. generalizations as to the direction of these effects should be submitted to close scrutiny" (Ritchey & Stokes: 1972;227,229).

From that point in time forward all the available evidence for the disruption hypothesis pertains to developing countries, and among this evidence an overwhelming amount of attention has been placed on the events taking place in South-East Asia. A case in point is that of Thailand for which we have been able to document two reports presented by Goldstein, S.(1973) and by Goldstein, S. & Goldstein, A. (1981). In the first of these studies Goldstein, S. used data from a one percent sample of the 1960 Thailand National Census (containing information on rural-urban residence of the respondents, lifetime and five-years migration, and number of children ever born to all ever-married women) to assess the age selective nature of population movement, and the extent of the fertility differentials among the migrant and nonmigrant groups of the population.

From this set of data Goldstein, S. noted that the significant differences between the fertility of migrants and nonmigrants only showed when considering five-year migration status - and not for lifetime migration - and that within these categories the fertility level of migrant women was not only below that of nonmigrants in Bangkok, but also far below that of both nonmigrant and migrant women in rural and agricultural areas. These facts suggested that migration to Bangkok was either selective of women with lower fertility at place of origin or that it affected fertility after migration.

In order to throw some light on this question, Goldstein, S. analyzed the age-specific fertility data and concluded that "these data suggest that not only does migration select those rural women whose fertility is initially lower than that of nonmigrant in the place of origin but that the younger women also have lower fertility, at least within five years of migration, than the nonmigrant women in their place of destination... Bangkok has a high percentage of ever-married women without spouse present in its 1960 Census. This may partially explain the low fertility of recent Bangkok migrants" (Goldstein,S.:1973;238).

The second study for Thailand reported by Goldstein, S. and Goldstein, A. (1981) presents two main differences in relation to the previous one. On the one hand this study is based on a sample obtained from the 1970 Thailand National Census, and in the other hand the authors resorted to the 'own-children' methodological approach for the analysis of the impact of migration on fertility, an issue to which we will return in the following section of this chapter.

In this case, however, the authors - after making a cautionary note on the implicit disadvantages of the own-children methodology for measuring fertility differentials for migrant and nonmigrant populations - went on to analyze the age-specific number of own-children per 1000 ever-married women, the total 'effective' fertility rate, and its decomposition according to own-children under the age of one year of age, and own-children aged 1 to 4.

From this analysis the Goldsteins concluded that "judged by the total 'effective' fertility rate, the fertility of migrants in the Kingdom as a whole is somewhat below that of nonmigrants regardless of whether the measure of fertility is based on children 1 to 4, or less than one year old. Using the latter measure, however, slightly narrows the difference ...indicating a greater similarity in more recent fertility .. (and suggesting).. that disruptions in childbearing associated with the time about migration may dissipate somewhat as migrants' length of stay at their destination increases; the tempo of their childbearing may accelerate" (Goldstein,S. & Goldstein,A.:1981;271).

A further development in the formalization of the disruption hypothesis has been reported in the literature in a study for Malaysia by Bach, (1981). Benefiting from the previous proposal suggested by Ritchey & Stokes (1972), Bach designed and tested two models which were intended to take account of the 'place' effects of migration upon fertility, and of the potential effects stemming from the process of migration <u>per se</u>. The main assumption underlying these two models was that "if the additive, residential effects of origin and destination can predict accurately both migrant's and nonmigrant's fertility...no additional knowledge of residential changes is needed. But if the additive, residential effects do not predict fertility accurately, the characteristics attributable to the process of migration itself must be considered..(by an interactive model)..in addition to the residential effects" (Bach: 1981;506).

In order to fit and test the models proposed, Bach used data from a KAP-style National Survey carried out in the late 1966 and early 1967, which included information for a sample of 5,457 currently married women between 15 and 44 years of age, measuring fertility as total number of live births. Once the models were fitted Bach concluded that "the findings from this study suggest that, for the most part, fertility levels of migrants can be accounted for through the proposed and accepted assimilation (additive residential) model...However, one also needs to consider the unique but small effect of migration per se. There is some evidence that the lower than expected fertility of migrants from cities to towns and from rural to urban areas is associated with their migratory behaviour itself" (Ibid;518).

The last two studies for Asia are those presented by Tuladhar & Stoeckel, (1982), and by Farooq, et.al.,(1986). The report presented by the former is based on information from a sample of 7,035 currently-married women aged 15 to 44, which was gathered in a household demographic survey conducted during 1978 in the North and South regions of Nepal. With this information Tuladhar and Stoeckel were able to compare the reproductive behaviour of inmigrants from the 'other districts' to the Northern region of Nepal with that of nonmigrants (migrants defined as those whose previous residence was other than the North region) by means of age-specific marital fertility rates, total marital fertility rates, and mean number of children ever born controlling for marriage duration.

In comparing the fertility of migrants and nonmigrants the authors found little difference in the total marital fertility rates of these groups, but noticed that the age-specific marital fertility rates of nonmigrants peaked at ages 25 to 29 while those of the migrant women reached the peak at ages 30 to 34, and also that the migrants' mean number of children ever born were higher than those of the nonmigrant women. Based on these findings it was suggested that "the inference could be drawn that factors are operating in the receiving population (sic) that have exerted a depressing effect upon the fertility of migrants from 'other districts'. This could be consistent with migration studies in other countries which suggest that fertility of migrants tends to drop initially as a response to limited resources...in the new environment" (Tuladhar & Stoeckel:1982;201-202).

The final study reviewed for Asia is the one reported for Pakistan by Farooq, et.al.,(1986), which is based on information from a 1980 household sample survey which replicated the 1975 Pakistan Fertility Survey and included 9,000 ever-married women aged 50 years and below. As the authors used regression analysis, they concluded that "out of the three variables capturing the influence of migration (premarital residence in rural areas, husband's inmigration during the ten previous years, and out-migration from the household) only the variable representing females in urban areas having premarital residence in rural areas emerges as significantly negatively associated with fertility level in non-metropolitan and metropolitan urban areas. Across the cohorts..the results suggest that the disruptive effect of migration was less in the case of non-metropolitan areas" (Farooq, et.al.:1986;27).

In the case of the Americas the only study found in the literature in support of the disruption hypothesis is that presented by Hervitz, (1985) for Brazil, in which he uses a sub-sample of the 1976 Pesquisa Nacional de Amostra Domiciliar containing information on children ever born to 27,314 married women between the ages of 15 and 44 at the time of the survey, classified as migrants if born in a county different from their current county of residence.

The main objectives of the above mentioned study were to compare the fertility levels of migrants with those of stayers at both origin and destination areas - distinguishing migration streams between modern to urban, modern to rural, traditional to urban, traditional to rural, and frontier to urban areas - after controlling for age, education, marital status, and residence durations for migrants at place of destination; and on that basis, to establish the prevailing patterns of fertility behaviour following migration. The main finding of this study is that "the evidence quite strongly suggests the presence of significant disruption effects affecting many - but not all - migrant categories..(and that)..there is substantial evidence of partial, but not complete, adaptation for most migrant categories, once the disruption effect disappears" (Hervitz:1985;306).

1.1.6.- Hypotheses.

In relation to the general objective of this thesis, it should be pointed out that from the preceding review of studies that deal with the relationship between migration and fertility, there is a series of suggestions that can be derived from the cumulated experience of each of the particular hypotheses that have already been empirically tested.

In this regard, starting with the socialization hypothesis, it could be seen that the general experience from the developed countries seems to be that - at the national level - as the pattern of reproductive behaviour of the urban and rural populations tended to converge at a low level of fertility, the residential background factor diminished in its strength as a predictor of the fertility behaviour for the migrant population.

However, it should also be noted that at the regional level of some developed countries, there has been some evidence that for particular birth-cohorts the socialization environment keeps on being among the best predictors of reproductive behaviour. A case in point is that reported by Jansen & Hauser, (1981) for the birth-cohort born between 1937 and 1940 in the state of Wisconsin in the U.S.A., for which the positive influence on fertility of farm-background was found to be more pervasive and lasting than that of religious socialization.

Their study - which did not include data for migration status and therefore one can only speculate about the effects of socialization for migrants - helps to make the point, nevertheless, that the residential-background effects are still very much present even in the developed countries, and that they appear to be a factor affecting migrants' fertility.

In the case of the developing countries, still within the framework of the socialization hypothesis, the documented experience from Bombay and from Latin America indicates that even when the rural-urban fertility differential was relatively low - in relation to the prevailing fertility levels - the rural-socialization effect was present. Therefore, if one assumes that after the late 1960s the fertility differentials tended to increase between the rural and urban areas mainly as a result of the onset of fertility decline in the latter, and that about the same time the positive selection of rural migrants started to decrease, one is led to suggest that the socialization effect upon the fertility of migrants must have been present at least during the last two decades or so.

As in the case of the developed countries, however, one should also keep in mind that, as some recent studies have pointed out (Juarez:1988), the selectivity of migration has already started to change in the developing countries. Now the likelihood of migrating seems to be more closely related to being socialized in an urban context than in a rural environment, and that should modify our expectations in relation to the fertility behaviour of migrants. Furthermore, it is our contention that if in the future some attention is shifted from the predominant analysis of migration to metropolitan areas towards the analysis of regional patterns of population mobility, this new selectivity factor would show up on a wider scale.

Turning now to the adaptation hypothesis, a first point to underline is the striking feature that in our review of the literature not a single study turns out to document this hypothesis for the developed countries. Considering this fact, in addition to the decreasing relevance of the socialization environment as a predictor of the reproductive behaviour of the migrant population and also that the main body of available evidence points to the positive selectivity of migration, allows us to suggest that at least in the developed countries once the fertility patterns of the rural and urban populations are at similar levels, migration tends to be selective for those with lower fertility.

The evidence for the developing countries in relation to the adaptation hypothesis indicates that length of exposure, life cycle stage, and the type of migration stream (i.e. selective, or not) are closely related in determining whether or not migrants adopt the predominant reproductive norms at the place of destination. When considered again, however, all these factors, in our view, are really pointing to the underlying relevance of place of socialization, perhaps not in the classical way of 'place of birth', but more in the lines of reproductive behaviour norms determined by the 'environment' up to a given age, followed possibly by the modification of norms as a function of length of exposure, and of the degree of selectivity of the migration stream.

As stated above, the evidence for the selectivity hypothesis pertaining to the developed countries strongly suggests a pattern of increasing mobility for those with lower fertility, at least in the cases of Canada, England and Wales, and the USA. However, for the developing countries the evidence in relation to the selective nature of migration suggests a mixed set of trends. For instance in the case of Latin America, with the exception of the doubtful evidence for Puerto Rico, the predominant decreasing trend in positive selectivity implies increasing mobility of those with high fertility.

Meanwhile the limited evidence from Asia and Africa points to a recent pattern of migrant selection for those with low fertility, which at the same time seems to be accompanied by a growing sex-selectivity for female migrants, as is also the case for Latin America (see, International Migration Review:1984).

Finally, the disruption hypothesis in its general proposition of independent 'migration' effects upon fertility has been demonstrated for the developed countries, although the evidence for the United States of America indicated higher fertility for migrants when 'place' effects were controlled. On the other hand, the evidence for the developing countries strongly suggests the presence of disruptive effects on migrants' fertility, although with varying degrees of magnitude and always accompanied by the 'catch-up' or re-accelerated pace of childbearing.

In summary, our review indicates that for the developed countries one should expect a predominance of the selectivity effect, due to the higher mobility of those with lower fertility than that of nonmigrants, while in the developing countries the mixed trends indicate that one should expect to find strong 'place' effects in Latin America, and increasingly positive selectivity and disruption effects in South East Asia and perhaps in North Africa.

The basis for the assumption that the 'place' effects (i.e. those related with place of socialization and/or adaptation to current place of residence) should prevail in the fertility-migration relationship in Latin America, stem from two interrelated factors.

On the one hand, it has been shown that most of the evidence presented in the reviewed studies points to a increasing negative selectivity amongst Latin American migrants (Browning & Feindt:1969. Alberts:1977), which implies increasing mobility of those with high fertility.

At the same time, on the other hand, it has also been pointed out that even when the rural-urban fertility differential was relatively low, rural to urban migrants had higher fertility than non-migrant urban residents (Miro:1966. Brito:1969).

In the specific case of Mexico, therefore, if one assumes that at least during the last two decades fertility differentials tended to increase between the rural and urban populations as a result of the earlier onset of fertility decline amongst the latter, and that about the same time the negative-selectivity of migrants started to increase, we are led to postulate as our central general hypothesis that <u>the socialization and/or adaptation effects of migration upon fertility must have been present</u> during the last 15 to 20 years or so.

At this point it should be noted that the two central concepts included in our general hypothesis (i.e. socialization and/or adaptation), have been incorporated into the fertility-migration research from the realm of sociology, where they have been usually associated with the 'structural-functional analysis' perspective (Levy:1952).

One of the central assumptions of that analytical perspective of sociology is that in any given social unit there are 'functional requisites', which have been defined as "a generalized condition necessary for the maintenance of the (social) unit with which it (i.e. functional requisite) is associated, given the level of generalization of the definition of that (social) unit and the most general setting of such (social) unit" (Ibid;62).

In other words, that analytical approach seeks to identify "what must be done, and how must what must be done, be done?" (Ibid;64), if the social unit is to avoid the conditions which will terminate the existence of a society, i.e. "(a) the biological extinction or dispersion of the members, (b) the apathy of the members, (c) the war of all against all, and (d) the absorption of the society into another society"(Ibid;137).

On this analytical basis, the 'structural-functional' sociological approach has been able to identify what has been termed 'the functional requisites of any society' which, amongst others include "(A) provision for an adequate physiological relationship to the setting and for sexual recruitment; (B) role differentiation and role assignment; (C) communication; (D) shared cognitive orientations; (E) a shared articulated set of goals; (F) regulation of choice of means; (G) regulation of affective expression; (H) adequate socialization; (I) effective control of disruptive forms of behaviour; and (J) adequate institutionalization" (Ibid;149-51).

From this particular list, for the purposes of our study two of those 'functional requisites' deserve further comment; 'provision for an adequate physiological relationship to the setting and for sexual recruitment', and 'adequate socialization'. The former function or functional requisite "includes adaptation to, manipulation of, and alteration of the setting in such a way as to (a) maintain a sufficient number and kind of the members of the society at an adequate level of operation; (b) deal with the implications of the setting for the existence of the unit concerned in a manner that permits the biological persistence of the membership; and (c) pattern heterosexual relationships to insure opportunities and 'motivation' for a sufficient rate of reproduction" (Ibid; 152).

The requirement of ensuring a 'sufficient rate of reproduction', has been further specified so as to distinguish that "negative population growth (should be avoided since it) obviously must lead to extinction if not reversed..(and that). ..positive population growth requires changing environmental parameters by territorial expansion, changing the diet and/or the technology of food acquisition or sooner or later reaching limits requiring higher mortality" (Moore:1979;344).

It has been suggested, nevertheless, that human populations are never limited to merely 'natural' restraints on growth through starvation, since "rules on who mate and under what circumstances, contraception, induced abortion, and infanticide provide possible remedies for excessive increase" (Ibid;346).

Transmiting - amongst others - those rules, values, and norms of behaviour within a social unit to both infant and neophytes is what is involved in the process of 'adequate socialization'. It has been defined and further specified as "the inculcation of the structure of action of a society on an individual...as to permit (if adequately socialized) the effective performance of (his/her) roles in the society" (Levy:1952;186).

That is to say, that if a society is to avoid termination "there must be transmitted specifically to each individual...the minimum necessary quota...of modes of communication, of the shared cognitive orientations, goals systems, attitudes involved in the regulation of means, modes of affective expression...as will render (him/her) capable of adequate performance in (his/her) several roles throughout life, both as respect skills and attitudes"(Ibid;189).

Thus, in the context of our study, we will be referring to the concept of socialization as the process by means of which an individual is incorporated into the socially patterned behaviour of the society into which he/she is born, by internalizing values and norms of reproductive and other behaviour through formal and informal education which involve "cathectic-evaluative and cognitive mechanisms. The former includes reinforcement-extinction, based upon reward and punishment. The latter involves imitation and identification, based on feelings of esteem or love" (Hinkle: 1957;16). On the other hand, the concept of adaptation will be used here to refer to the process by means of which an individual internalizes a set of norms of reproductive and other behaviour of social groups which are other than that in to which he/she was born.

Having stated our central hypothesis and defined the two central concepts involved in it, in the next section of this chapter we will be addressing the issues of the methodological approach to the analysis of the fertility-migration relationship, and of the available alternative models that allow us to implement the methodological approach that we will be suggesting as the appropriate means for the analysis of that relationship; i.e. the proximate determinants of fertility.

1.2.- The Proximate Determinants of Fertility.

1.2.1.- Methodological approach.

In relation to the methodological approaches that prevail within the fertility-migration related research, the foregoing review of the literature allows us to distinguish two strong and interrelated methodological trends. The first of these is that of making the best use of the available data at a given point in time. In the developed countries the path appears to have evolved from the use of 'specialized' survey data, to nationally representative survey data, to Census returns, and finally to links between Census and vital registration information. Meanwhile in the developing countries the trend seems to be somewhat the 'reverse', since the earlier studies mainly relied on Census and vital registration information, while the most recent ones take advantage of the widespread availability of nationally representative demographic surveys.

In spite of the divergent paths on the source of information, the final effect of this effort to make the best use of the available information both in the developed and developing countries, has been that of limiting the comparability of the results, incorporating the intrinsic deficiencies of the information itself, and of demanding the adoption of strong assumptions or/and un-orthodox procedures. Examples of the latter problems could be found, for instance, in the wide use of children to woman ratios, and of the 'own-children' technique to measure fertility in spite of the fact that both measurements are known to be affected by general underenumeration, and particularly affected by child-woman separation in the case of migrants (Kemp:1946. Robinson:1961).

On a more positive level, the second and related trend on the methodological approach to the migration and fertility relation is that of the growing resort to a multiple-hypotheses analysis, and of an increasing adoption of a macro-level assessment of its implications. The evidence for the former of these elements can be found in the reviewed studies, as one notes that the earlier attempts were those dealing with test of a single hypothesis (Duncan:1965), and that the more recent studies either tend to base their approach on pairs of hypotheses (i.e. selectivity and/or adaptation, and place and/or disruption effects) as in the case of Farber & Lee, (1984) and Bach, (1981), or definitely setting out to test the relevance of each of the four hypotheses for a given country as in the case of the studies by Hervitz, (1985), and partially in the version presented by Juarez, (1988).

The second element of this trend is somewhat less evident than the previous one in the literature reviewed, but nonetheless it has become more explicit - for instance in the developed countries - that ultimately the relevance of the migration-fertility relationship lies on its potential repercussions on the age-sex structure of the population, and that in turn on its dynamics (Grundy: 1989).

Additionally, this recognition of the macro-relevance of the migration-fertility relation - which in the case of the developed countries seems to be located more at the regional than at the national level - also seems to be acquiring importance beyond its metropolitan repercussions in the developing countries.

Having proposed what we consider to be the two methodological trends in research related to the migration-fertility relationship, we now turn to two additional issues. The first of these is one concerned with the pervasiveness in the reviewed studies of a limited, although key set of variables in helping to explain the relation between migration and fertility.

One can see throughout this review that from studies based on simple standardization to those relying on longitudinal-dynamic reciprocal models, the weight of the explanation of the differential reproductive patterns between migrant and nonmigrant populations has, ultimately, concentrated on such basic variables as age, marital status, age at marriage, contraception practice, and last but not least on education.

The relevance of the last variable should not be under-emphasized since its relationship and determining influence upon reproductive behaviour has been widely documented, specially in relation to its effects on age at marriage, contraceptive knowledge and practise, infant and child mortality, breast-feeding practise, and for migration itself (Ridker:1976. Rodriguez & Cleland:1981), although its variable importance among and within developed and developing nations should also be kept in mind.

Taking into consideration the trend toward multiple-hypotheses research, the need for macro-level assessments of the effects of the migration-fertility relationship, and the resilience of the limited set of variables involved in the migration-fertility related research, our contention is that an analysis of such a relationship by means of the proximate determinants of fertility model, could be both analytically successful and policy-relevant.

In this regard we contend, firstly, that the cumulated methodological research experience on the migration-fertility relation increasingly points towards both a comprehensive and macro-level approach in the assessment of the effects of migration upon migrants' fertility. And secondly, that the intervening variables, the final purpose of the analysis of the migration-fertility relationship, and the now available sets of information, strongly suggest that an approach based on the Bongaarts' proximate determinants of fertility model would be a useful one.

The argument in favour of the Bongaarts' model application is based on some of the general advantages that the model offers for the analysis of the migration-fertility relation, especially in the case of the developing countries.

First of all, the Bongaarts' model by its own definition allows one to assess the differential contribution that each of the intermediate variables makes to the fertility level of a given population, which in turn becomes a major advantage for purposes of comparing the reproductive behaviour of two sub-groups of the population, which are supposed and expected to be responding in a differentiated manner to the remote factors affecting their fertility patterns.

Following this line of argument, it should be pointed out that the intermediate variables framework, as well as its quantitative version in the Bongaarts' model, were originally proposed as an analytical approach for the "comparative sociology of fertility" (Davis & Blake:1956; 211) and as a means "to be used in comparative fertility analysis to determine the intermediate fertility variables responsible for fertility differences among populations or among subgroups within a population" (Bongaarts:1978;125).

A second major advantage to emphasize, is that the model by its own original design takes into account the main set of variables that have been found to be crucial in the analysis of the migration-fertility relation, by means of the interactions depicted in the model between the indices of nuptiality, contraception, postpartum infecundability, and abortion.

On a closely related matter, a third advantage stemming from the model seems to be its implicit relation to the major demographic hypotheses concerning the migration-fertility relationship. In arguing this point it appears worthwhile to stress the fact that from its original design, the intermediate variables approach was devised as a means for understanding the effects of the cultural-societal influences on fertility (Davis & Blake: 1956). For this matter the socialization and adaptation hypotheses on the relation between migration and fertility could not be more straightforward in their relevance to the model, since the former are intended to account for the 'cultural-environmental' influences of place of residence upon fertility. As for the case of the selectivity and disruption hypotheses, which mainly point to biologically-related factors observed amongst migrants (i.e. age, sex, marital status, and spousal separation to name only a few) no further argument is considered to be relevant to emphasize its explicit relation to the Bongaarts' model.

A further additional element to take into consideration, at least in the case of the developing countries, is that of the already available relevant evidence. A case in point is that of the study presented by Singh, Casterline & Cleland, (1985) in which the authors - based on World Fertility Survey information for 29 countries and on the application of a version of Bongaarts' model - were able to find that "the most conspicuous feature..is the uniform nature of the influence of an urban setting on the three proximate determinants (index of abortion not included) of fertility. The fertility reducing impact of marriage and contraception is nearly always greater among women living in towns and small cities than for rural women and greater still for those living in urban centres. Conversely, the restraint on fertility exercised by lactation almost invariably weakens as the degree of urbanity increases (from rural to other urban, and to major urban)" (Ibid;114). Such evidence, in our contention, suggests the potential analytical rewards of the Bongaarts' model application on the study of the migration-fertility relation.

Last but not least, we would like to underline that the suggested model provides an instrument of aggregated-macro evaluation of the reproductive behaviour of a given population, and since the aim of the research on the migration-fertility relation ultimately is that of its impact on the structure and dynamics of a population, the prospects of a combination of those two elements could only be expected to be policy-relevant.

With those considerations in mind, in the following subsections of this chapter we present the analytical framework of the intermediate variables of fertility, describe its basic concepts, and then present the alternative models that have been suggested as the means for the quantitative assessment of the intermediate variables.

1.2.2.- The analytical framework.

The fundamental premise that socio-economic factors could not have a direct effect on fertility and that, therefore, their effects have to operate through a common set of proximate determinants (i.e. intermediate variables), has been described as the consensus or the 'normal science' that underlies the analytical scheme for fertility related research and permitted certain types of research in this area to proceed rapidly (Menken:1989).

The approach was originally suggested by Davis and Blake, (1956) in a seminal paper, the central aim of which was that of proposing a framework for the comparative sociology of fertility. In it, the authors argued that in order to analyze and explain not only the observed fertility-level differentials between developed and developing countries, but also to understand how similar levels of fertility could be achieved amongst those groups of countries in spite of their clearly differentiated social organizations, it was necessary to resort to a set of factors that being directly connected with the process of reproduction would have to be - at the same time - "those through which, and only through which, cultural conditions can affect fertility" (Ibid;211).

Given their mediating function between social structures and patterns of reproductive behaviour, Davis & Blake coined the term 'intermediate variables' to designate that set of factors directly related to the reproductive process. In all, the authors identified eleven intermediate variables which, in turn, were grouped according to their relation with what they called the three 'necessary steps' of the reproduction process, i.e. intercourse, conception, and gestation and parturition.

According to the authors classification, six out of their eleven intermediate variables were directly related to the intercourse phase of the reproductive process and - being referred to as 'factors affecting exposure to intercourse' or 'intercourse variables' - they were, in turn, subdivided into factors 'governing the formation and dissolution of unions', and factors 'governing the exposure to intercourse within unions'.

Among the factors governing the formation and dissolution of unions Davis & Blake identified; (1) age at entry into sexual union; (2) proportion of women never entering sexual union (i.e. permanent celibacy), and; (3) amount of reproductive period spent after or between unions (i.e. union dissolution/disruption, and widowhood). Within this same group of 'intercourse variables' but identified as factors governing the exposure to intercourse within unions, the authors included; (4) voluntary abstinence; (5) involuntary abstinence (i.e. due to illness and/or involuntary separations), and; (6) coital frequency.

For the second phase of the reproductive process, i.e. conception, the authors distinguished three 'conception variables' or factors affecting exposure to conception; (7) fecundity or infecundity, as affected by involuntary causes (i.e. involuntary sterility); (8) use or non-use of contraceptive methods, either mechanical and chemical, or any other means, and; (9) fecundity or infecundity, as affected by voluntary causes (i.e. voluntary sterilization).

Lastly, for the gestation and parturition phase of the reproductive process Davis & Blake identified two factors; (10) foetal mortality from involuntary causes (i.e. spontaneous abortion/miscarriage), and; (11) foetal mortality from voluntary causes (i.e. induced abortion).

In relation to that set of biological and behavioral intermediate variables, Davis & Blake, (1956) did emphasize that all the variables are present in every society; that each of them can operate either to reduce or to enhance fertility, and; that "the absence of a specific practice does not imply 'no influence' on fertility, because this very absence is a form of influence" (Ibid; 213).

Having defined their analytical framework, the authors set out a qualitative assessment of the differential effects that the intermediate variables had between industrial and underdeveloped societies, and from it they reached the conclusion, amongst others, that "for many of the variables the two types of society exhibit opposite values. This is true for age at entry into unions, permanent celibacy, voluntary abstinence (and) contraception" (Ibid; 215), and thus they were able to identify the mechanisms that lay behind both the high fertility levels of the pre-industrial societies, and the low fertility levels observed in industrialized societies.

Chronologically parallel to the development of the analytical framework proposed by Davis & Blake, but quite independently, during the 1950s Henry, (1972) started to build quantitative models which were able to simulate the reproductive behaviour of historical populations. From Henry's approach to the reproductive process a different, but overlapping, set of proximate determinants has been produced.

This quantitatively-oriented set of proximate determinants of fertility has both the advantage of including what is now known to be a key intermediate variable (i.e. lactation infecundability) that was missing in the Davis & Blake framework, and the intrinsic characteristic that when compared to the list proposed by the latter authors it is relatively easy to incorporate into reproductive models.

The most commonly agreed and cited, listing of the 'new' set of proximate determinants is that which was presented in a now classic article by Bongaarts, (1978), in which it was suggested that "to allow simple quantification.. ..the set of 11 intermediate variables proposed by Davis & Blake (may be collapsed) into eight factors grouped in three broad categories" (Ibid;106), which are:

I.- Exposure factors;
    1.- Proportions married.
II.- Deliberate marital fertility control factors;
    2.- Contraception,
    3.- Induced abortion.
III.- Natural marital fertility factors;
    4.- Lactation infecundability,
    5.- Frequency of intercourse,
    6.- Sterility,
    7.- Spontaneous intrauterine mortality, and
    8.- Duration of the fertile period.

For each of these variables, a brief description of what they are intended to measure would be as follows (Cf. Bongaarts:1978;107);

1.- Proportions married: Measures the proportion of women of reproductive age that engages in sexual intercourse regularly (i.e. all women living in sexual union);

2.- Contraception: Any deliberate parity-dependent practice undertaken to reduce the risk of conception (including abstention and sterilization);

3.- Induced abortion: Any practice that deliberately interrupts the normal course of gestation;

4.- Lactational infecundability: The prolongation of the physiological (normal) post-partum infecundable period, due to the duration and intensity of lactation, and/or due to post-partum abstinence;

5.- Frequency of intercourse: Measurement of the normal variations in the rate of intercourse, including those due to temporary separation or illness (voluntary abstinence, temporary or terminal, is excluded);

6.- Sterility: Measurement of sterility for reasons other than contraceptive sterilization, which affect couples within the woman's reproductive period (i.e. the period which begins at marriage or/and menarche, and finishes after menopause) such as temporary or permanent sterility due to venereal diseases;

7.- Spontaneous intrauterine mortality: The proportion of all conceptions that do not result in a live birth (i.e. spontaneous abortions or stillbirths), and;

8.- Duration of the fertile period: The monthly period in which a woman is able to conceive (approximately two days), and which is a function of the duration of the viability of the sperm and the ovum.

The last four variables, which were included under the heading of 'marital fertility factors' - alongside with lactational infecundability - since they are those practices that have been observed to be present in populations in which couples do not practice deliberate fertility control dependent on the number of children that they have (i.e. where 'natural' fertility prevails), have also been assumed to be those proximate determinants that have the least significant direct effects both in the variations of the fertility levels, and in explaining the differences in fertility among populations (Bongaarts:1978 & 1982).

Some of the main exceptions to the latter assumptions can be found when there are; (i) high prevalence of prolonged involuntary spousal separation (e.g. temporary labour migration) which lead to periods of zero coital frequency; (ii) high prevalence of venereal diseases which can lead to temporary or permanent sterility, and; (iii) where the effects of nutrition and health indirectly affect the proximate determinants through infant and adult mortality (since the former can determine both use of contraception and/or post-partum infecundability through breast-feeding, and the latter can affect the proportions of women in union through widowhood), and through the ability to breast-feed for shorter or longer periods (see, Bongaarts:1978;119-120. Bongaarts & Potter:1983;14-17).

1.2.3.- The alternative models.

Within the literature related to the quantitative approach to the analysis of the proximate determinants of fertility, the fundamental assumption that underlies most of the models - at one stage or another - is that the fertility rate for fecund women can be estimated by the reciprocal of the interval between births (see, Bongaarts & Potter:1983;4. Mosley, et.al.:1982;8).

That assumption stems from a further re-classification of the intermediate variables of fertility, in which it is suggested that fertility is governed by two types of proximate determinants; (i) those that affect exposure to the risk of childbearing, and; (ii) those that affect the rate of fertility during the period of exposure, or equivalently, the interval between births in that period (Menken:1989).

The events that determine and influence the duration of the reproductive period and the rate of childbearing during it, can be observed in Figure 1.2.1. A first point to notice about the events that define the limits of the reproductive span, is that there are both biological and social variables affecting the exposure to the risk of childbearing.

The biological 'exposure variables' define the potential reproductive years or biological reproductive span, which is usually measured as the time between menarche and menopause. On the other hand, the social 'exposure variables' define the social reproductive span - or period of exposure to sexual activity - which is measured as the duration between marriage and final marriage dissolution.

Taken together, "the biological and social exposure periods constitute the effective reproductive span, which is the result of the overlap of those two periods since it begins at menarche or marriage, whichever occurs last, and ends at menopause or marriage dissolution, whichever occurs first" (Menken: 1989; 80-81).

Within the effective reproductive span, the rate of childbearing or the birth-length interval is determined by the following components (Cf. Bongaarts & Potter:1983):

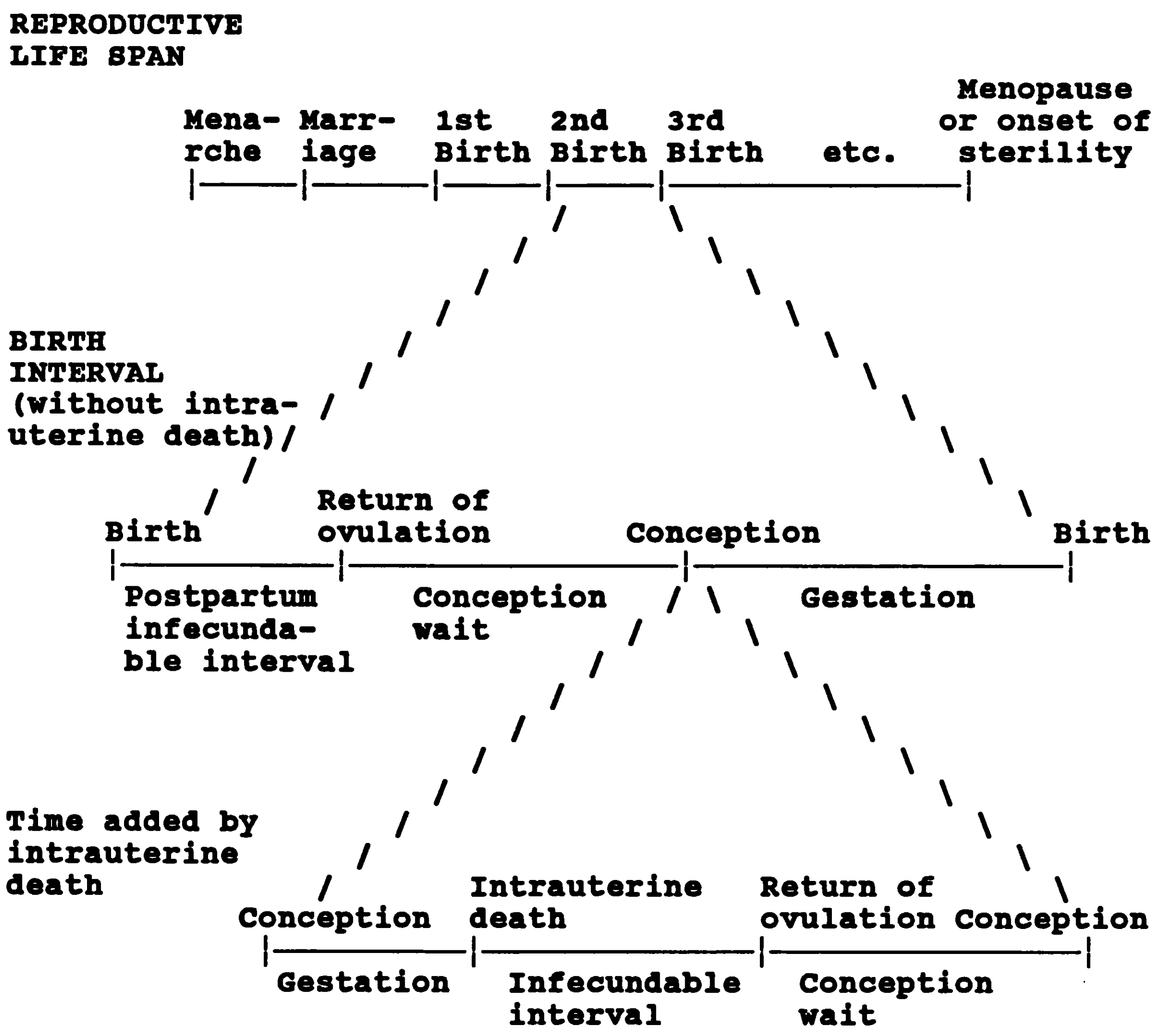
1.- The post-partum infecundable interval. The duration of this period, which is that in which after a birth a woman experiences the absence of the normal pattern of ovulation, is primarily a function of the breast-feeding behaviour, and - in some societies - of the length of the practice of post-partum abstinence;

2.- The waiting time to conception (i.e. from first post-partum ovulation to conception). The duration of this period is inversely related to the use and effectiveness of contraception, and to the natural fecundability (i.e. the monthly probability of conception in the absence of contraception), which in turn is partially determined by the frequency of intercourse;

3a.- A full-term pregnancy which, due to its small variation in duration, is assumed to be a constant segment with a duration of nine months, and;

3b.- The additional segments of a shortened pregnancy, a brief infecundable period, and a conception delay that would be added to the birth interval, if a pregnancy ends prematurely due to a spontaneous or induced intrauterine death.

Figure 1.2.1.- Events Determining the Reproductive Life Span and the Rate of Childbearing.



Source: Bongaarts & Potter, (1983;4).

In addition to the assumption stemming from this re-grouping of the proximate determinants, most of the models that deal with the quantitative assessment of their effects share a further basic assumption, which is that of the 'fertility-reducing' or 'fertility-inhibiting' effect of the proximate determinants (see, Bongaarts:1982;180: Gaslonde & Carrasco:1982;9: Hobcraft & Little: 1984;23). That is to say, that the models consider the proximate determinants as fertility inhibitors because actual "fertility is lower than its maximum value as a result of delayed marriage and marital disruption, the use of contraception and induced abortion, and post-partum infecundability induced by breast-feeding or abstinence" (Bongaarts & Potter:1983;79)[4].

Based on this set of assumptions, one can find within the literature two clearly differentiated approaches to the quantification of the fertility-inhibiting effects of the proximate determinants. The first approach, chronologically, is that originally proposed by Gaslonde & Bocaz, (1970), in which the assessment is attempted at the individual level by measuring the time spent by women in various categories over a recent period. In the specific case, the authors developed a Sexual Activity Table - allowing them to define a sexual-life history approach - in which they collected and identified, for each month of the previous calendar year, pregnancies by outcome (live births and foetal deaths), absence of sexual relations by reasons (celibacy, temporary absence of one of the partners, separation/divorce, illness, and other causes), and months with sexual relations identified by contraceptive use and specific method (Gaslonde & Carrasco: 1982).

The same person-time criterion which was suggested

4.- Natural fecundity, spontaneous intrauterine mortality, and permanent sterility are included only as residual factors in the model, since it has been suggested that they are generally much less important causes of variation in fertility (see, Bongaarts & Potter:1983;21- 46).

by Gaslonde & Bocaz for the assessment of some of the intermediate variables, can be found underlying what has been described as the "most fully developed alternative procedure (to that of Bongaarts) for assessing the fertility reducing impact of the proximate determinants so far" (Hobcraft: 1987; 828); fertility exposure analysis (FEA).

This procedure was developed by Hobcraft & Little, (1984) and it has been suggested that the main advantage of FEA, which is also based on an individual-level analysis, is that it allows the integration of the analysis of the proximate determinants into a framework that also encompasses the remote (i.e socio-economic) determinants of fertility.

Some of the additional advantages that have been identified for FEA are (Cf. Hobcraft:1987;828); that it permits incorporation of coital frequency reports or self-reported fecundity status, through its stratification approach; that it is very explicit about rules of precedence between various proximate determinants; that it can handle partial protection; that it maintains absolute consistency of reference periods for all inputs; that it can incorporate internal estimates of contraceptive efficacy, as estimates of the fecundability-reducing effect of each status group; that it provides direct estimates of mean wait to conception; that it naturally incorporates age variation, and; that it uses exact accounting relationships for all measures.

That wide range of advantages stem from the fact that FEA relies on detailed allocation of women-time exposure on a month-by-month basis to a number of mutually exclusive categories, a feature that implies that for full, detailed, and accurate measurement such as that proposed by FEA, it would be necessary to resort to very large samples and to very specialized programs in order to handle and process the large amounts of data involved. That is to say, in other words, that the very desirable level of specificity embedded in the full

FEA design, turns out to be its major operational drawback[5].

The second, or alternative general approach to the quantification of the fertility-reducing effects of the proximate determinants, is that which is best represented by what is now known as the Bongaarts' model or framework. The basic difference between the previously described approach and that represented by the framework proposed by Bongaarts, (1978), is that the latter is a model in which the estimation of its various components is done directly at the aggregate level[6].

The Bongaarts' model is, basically, a decomposition of the Total Fertility Rate (TFR) into a product of five terms: a Total Fecundity Rate (TF) - or total potential fertility - which includes the effects of all the variables which are not explicitly incorporated into the model (i.e. natural fecundability or the duration of the fertile period and frequency of intercourse, intrauterine spontaneous mortality, and sterility), and a set of four proximate determinants which allow to take into account the TF reductions due to the proportion of the potential reproductive years that women spend out of marital union (i.e. index of proportions married, Cm); the proportion of married women using contraception, taking into account its contraceptive effectiveness (i.e. index of contraception, Cc); the proportion of the average number of births per woman, at the end of the reproductive years, that are not averted by induced abortion (i.e. index of induced abortion, Ca), and; the

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5.- It should be noticed, however, that it has been suggested that some of the data demands of FEA could be reduced by treating some of its endogenized efficacies as exogenous in actual applications, under the condition - which is an added advantage - that such assumptions should be explicitly and clearly stated (see, Hobcraft:1987;829).

6.- For an example of another aggregate-level approach model, which only deals with marital fertility variables see; Mosley, Werner, & Becker, (1982).

proportion of the average-length birth interval that remains after taking into account the infecundable-period increasing effect of breast-feeding and/or of post-partum abstinence (i.e. index of postpartum infecundability, Ci).

According to this model, women would have 15.3 children, on average, if they were married throughout their biological reproductive span, used no contraception or induced abortion, and did not breast-feed their children or practice post-partum sexual abstinence.

With regard to the Bongaarts' model information demands, it has been argued that "with the possible exception of the total abortion rate, these required data are readily available from standard sources. Censuses or household surveys usually produce estimates of age-specific proportions married. The total fertility rate, age-specific marital fertility rates, and proportions currently contracepting and lactating are obtained through fertility surveys or surveys of knowledge, attitude, and practice of contraception. Perhaps most difficult is the accurate measurement of the incidence of induced abortion, because one has to rely on official statistics of legal abortions or special surveys, both of which are believed to provide incomplete estimates in many countries" (Bongaarts:1978;121).

Finally, in relation to both these quantitative approaches to the contributions of the proximate determinants to the levels and trends of fertility, it should be noticed that there is an on-going debate (See; Hobcraft, (1987). Rindfuss, Palmore & Bumpass, (1989)) about the orientation of current and future fertility-related research through the proximate determinants approach which includes, amongst others, the following relevant issues:

i) There is growing concern about the issue that in spite of the fact that the proximate determinants of fertility have been already identified, it has also become common practice to resort to surrogates that even when they allow circumvention of the measurement problems of the 'real' proximate determinants, are not in themselves'problem-free' at the data collecting stage. Examples of these procedures can be found, for instance, in the common practice of substituting post- partum amenorrhoea, which is a surrogate for post-partum infecundity itself, with estimation procedures based on its relation with breast-feeding duration that can lead one to ignore the heterogeneity of post-partum amenorrhoea amongst women, or; substituting coital frequency with surrogates that identify status of zero frequency - sexual union status - but that do not even provide estimates of variations in the frequencies for those exposed, which in turn may be the source of heterogeneity in fecundability.

ii) As it has been indicated in the previous sub-section, the issue of the aggregation of the individual proximate determinants has already resulted in several modifications to its original version, which on the whole are fertility oriented. Based on more recent evidence, however, it has been suggested that perhaps it would be convenient to reconsider the criterion for grouping itself, since there are indications that, for example, proximate determinants that have been usually grouped under the same heading (e.g. post-partum abstinence and breast-feeding under post-partum infecundability) seem to be responding in quite a different manner to the effects of the remote determinants, a fact which in turn would lead one to consider the possibility of grouping together those proximate determinants which share common socio-economic factors.

iii) It has been noted that, even after leaving aside the measurement and grouping criteria problems mentioned above, there still remains the issue of the lack of agreement about the precise procedures involved in the construction of the model's indices themselves. We will be dealing with this specific issue at length in Section 3.1, but in the mean time suffice it to say that there are already indications that suggest that (Casterline, et.al.:1983), for instance, the way in which overlapping periods are treated (or ignored), the inclusion or exclusion of out-of-union births in computing the TFR, the use of current status or experience over a given reference period for union status in calculating the index of marriage, and the use of different age-specific schedules of sterility in constructing the index of contraception, could be of great consequence for the results that can be obtained from the model's applications.

Based on the forgoing argumentation, we contend that the cumulated methodological research experience on the migration-fertility relation (which increasingly points towards both a comprehensive and macro-level approach in the assessment of the effects of migration upon migrants' fertility), the intervening variables in this relation, the final purpose of the analysis of the migration-fertility relationship, and the now available sets of information, strongly support our selection of an approach based on the Bongaarts' proximate determinants of fertility model.

Once we have stated our objectives, hypothesis, concepts, methodological approach, and described the quantitative model that will allow us to assess the reproductive patterns of the native and inmigrant groups of the population of the state of Baja California (Chapters III and IV), in the following chapter of this thesis we describe the demographic and socio-economic context in which we will be analyzing the fertility-migration relationship.

II.- DEMOGRAPHIC AND SOCIO-ECONOMIC CONTEXT.

2.1.- The National and Regional Context.

In order to properly define the context in which the processes involving the relationship between migration and fertility have been taking place within Baja California, a major point is that Mexico's 20th century population growth has been divided into three main stages:

i) From 1900 to 1940; this period begins with a low rate of population growth, which is followed by the abrupt outbreak of the 1910s revolutionary period during which population actually decreased, and it ends with the recovery of populational growth albeit still at low rates;

ii) From 1940 to 1970, the stage of fast growth, and;

iii) from 1970 up to date, the period in which the growth rate declines.

During the period 1940 to 1970, as seen in Table 2.1.1, Mexico's total population growth rate almost doubled, from 1.72% to 3.43% per year, a change that caused the reduction of the doubling-time of the population from over 40 to around 20 years.

This period of fast population growth can be explained by a remarkable reduction of mortality, which was in sharp contrast with the fertility-levels trend which during this time remained high and stable. In this regard, furthermore, it has been noted that while the Crude Birth Rate remained virtually constant, ranging between 43.5o/oo in 1935-39 and 44.3o/oo per year during the period 1965-69, the Crude Death Rate decreased from 23.3o/oo to 9.8o/oo per year between those same dates (See, Alba: 1984;27).

TABLE 2.1.1
MEXICO AND BAJA CALIFORNIA: TOTAL POPULATION AND INTERCENSAL GROWTH RATE 1895-1990.

YEAR	MEXICO		BAJA CALIFORNIA		% OF TOTAL MEXICO'S POPULATION
	POPULATION	GROWTH RATE	POPULATION	GROWTH RATE	
1895	12,632,427		7,452		0.06
1900	13,607,259	1.5	7,583	0.3	0.06
1910	15,160,369	1.1	9,760	2.6	0.06
1921	14,334,780	-0.5	23,537	8.3	0.16
1930	16,552,722	1.1	48,327	8.9	0.29
1940	19,653,552	1.7	78,907	5.1	0.40
1950	25,791,017	2.7	226,965	10.9	0.88
1960	34,923,129	3.1	520,165	8.6	1.49
1970	48,225,238	3.4	870,421	5.5	1.80
1980	67,405,700	2.9	1,177,886	2.9	1.75
1990*	81,140,922	2.3	1,779,353	3.7	2.07

* National data source;**Banco Nacional de Comercio Exterior.** 'Resultados Preliminares del XI Censo General de Poblacion y Vivienda'. Comercio Exterior, Vol.40, No.8. August,1990. (pp.728): Baja California's data is for 1989; **CONEPO-BC** 'Encuesta Continua de Migracion de B.C., 1989'. (B.C.'s rate for 1970-1989 period). **Sources: Direccion General de Estadistica;** Censos Generales de Poblacion y Vivienda, 1895-1980. Secretaria de Industria y Comercio. Mexico, D.F.

However, during the 1980s Mexico's demographic situation has changed substantially, since there has been a significant fertility decline which has reduced the total population growth rate to an estimated 2.3% per year, according to the preliminary results from the 1990 census, with a total population of about 81.1 millions for 1990 (See, Table 2.1.1).

Of the total population, approximately half were under 20 years of age, and by 1980 more than 66.0% of the country's inhabitants were living in urban areas (i.e. 2,500 or more residents). This urbanization of the population, which began during the late 1930s, has rapidly concentrated the population in relatively few areas of the country, such as those of the metropolitan areas of Mexico City, Guadalajara, and Monterrey, which by 1980 accounted for almost a quarter of the country's total population. Furthermore, Mexico City's metropolitan area on its own has a population of more than 15 millions, i.e. 18.5% of Mexico's total population, according to the official preliminary results of the 1990 census(7).

However, it should be noted that Mexico's demographic trends have not been homogeneous throughout its different regions and states, and that therefore they have been classified - according to patterns of natural and social growth (CONAPO:1983) - as follows (see Figure 2.1.1 for the location of states):

A) Natural Growth.

i) Fertility;

Group I.- Low level of fertility (i.e. Gross Reproduction Rates under 2.0); Baja California, Distrito Federal (i.e. Mexico City), and Estado de Mexico.

Group II.- Relatively low fertility level (i.e. Gross Reproduction Rates from 2.0 to 2.5); Colima, Chihuahua, Nuevo Leon, Sonora, and Tamaulipas.

Group III.- Middle fertility level (i.e. Gross Reproduction Rates from 2.6 to 2.9); Aguascalientes, Baja California Sur, Campeche, Coahuila, Chiapas, Jalisco, Morelos, Nayarit, Quintana Roo, Sinaloa, Veracruz, and Yucatan.

Group IV.- High fertility level (i.e. Gross Reproduction Rates of 3.0 and more); Durango, Guanajuato, Guerrero, Hidalgo, Michoacan, Oaxaca, Puebla, Queretaro, San Luis Potosi, Tabasco, Tlaxcala, and Zacatecas.

ii) Mortality (grouped in relation to levels of childhood mortality, i.e. ${}_5m_0$);

7.- See, **Banco Nacional de Comercio Exterior** (1990) 'Resultados Preliminares del XI Censo General de Poblacion y Vivienda'. **Comercio Exterior**, Vol.40, No.8. August, (pp.728).

FIG. 2.1.1.- MAP OF MEXICO: STATES AND REGIONS

Group I.- Relatively low mortality level; Baja California, Baja California Sur, Distrito Federal, Nuevo Leon, Sinaloa, Sonora, and Tamaulipas.

Group II.- Middle level of mortality; Campeche, Chihuahua, Coahuila, Durango, Jalisco, Estado de Mexico, Michoacan, Morelos, Quintana Roo, Veracruz, and Yucatan.

Group III.- High level of mortality; Aguascalientes, Colima, Guerrero, Hidalgo, Tabasco, Tlaxcala, and Zacatecas.

Group IV.- Very high level of mortality; Chiapas, Guanajuato, Oaxaca, Puebla, Queretaro, and San Luis Potosi.

B) Social Growth.

Group I.- Population-attraction states (i.e. net migration growth higher than 1.0% per year); Baja California Sur, Estado de Mexico, and Quintana Roo.

Group II.- Equilibrium states (i.e. net migration growth around 0.0% per year); Aguascalientes, Baja California, Campeche, Coahuila, Colima, Chiapas, Distrito Federal, Guanajuato, Morelos, Nuevo Leon, Queretaro, Sonora, Tabasco, Tamaulipas, Veracruz, and Yucatan.

Group III.- Weak population-expulsion states (i.e. net migration growth between -0.6% and -1.0% per year); Guerrero, Jalisco, Nayarit, Oaxaca, Puebla, San Luis Potosi, and Sinaloa.

Group IV.- Strong population-expulsion states (i.e. net migration growth below -1.0% per year); Chihuahua, Durango, Hidalgo, Michoacan, Tlaxcala, and Zacatecas.

According to that classification, therefore, it can be said that the state of Baja California has been characterized as an area in which mortality and fertility levels are low, and where there is a situation of migration equilibrium or, at best, low positive net migration rates. Since the last fact relates directly to our central objective, it is dealt with at length in the following section.

2.2.- Baja California's Demographic Trends.

2.2.1.- Social growth.

The area covered by this study is that of the state of Baja California in Mexico, and as seen in Figure 2.1.1, it is located at the extreme North-West of Mexico. It encompasses an area of about 72 thousand square kilometres, which is about the size of the Irish Republic or Panama.

Within the state there are four major cities which account for just above 80.0% of the total population of the area. In Figure 2.1.1, No.1 indicates the capital of the state, Mexicali, and No.2 the city of Tijuana which is about 1,500 miles away from Mexico City - located within Region V in Figure 2.1.1 - a distance similar to that between London and Moscow, Istanbul or Marrakech.

In terms of the social growth of its population, four prominent features may be noted (Estrella:1981).

First of all, as one can see in Table 2.1.1, at the beginning of this century the state could have been classified as an almost 'empty area', since there were fewer than 8,000 inhabitants. Such low numbers in relation to the Mexico's total population at that time were, in our view, the result of three combined factors; (a) the absence of means of direct communication by land with the main body of the country; (b) the lack of a substantial and recurrent rainy season to support any kind of agricultural activities, and; (c) mainly due to the latter, the fact that the aborigine population consisted mainly of non-sedentary hunter-gathering groups.

The second feature to underline is that of the accelerated pace of growth that the state's population underwent during the first forty years of the century. As Table 2.1.1 shows, the population increased more than ten-fold between 1900 & 1940. Five of the major elements that help explain those rates of population growth are as follows.

In chronological order these factors were: (a) the central government's policy for the colonization of the northern areas of Mexico, which involved land concessions to both national and foreign land-developing companies, and the construction of rail-road links up to the northern international border on the west side of the country; (b) the inflow of refugees that were fleeing from the Revolutionary war between 1910 & 1920 either to the north-border western States where there was virtually no fighting, or to the United States of America; (c) the foreign labour demand that was fostered by the participation of the United States in World War I; (d) the development of 'entertainment-services' that the enactment of the Prohibition Law in the United States promoted in Mexican border towns, and; (e) the massive repatriation and deportation of Mexicans by the American authorities during the 1930s economic depression.

By the end of the 1930s Baja California had a fairly consolidated and mainly export-oriented agriculture based on irrigation, which was located at the extreme north-east of the state, and a tourism-oriented service industry which developed on the west coast of the state due to its closeness to the major population centres of California (i.e. San Diego and Los Angeles). However, several events that started during the late 1930s led to a second period of rapid population growth that, again, was mainly based on inmigration.

This additional process of inmigration, which constitutes the third feature of the Baja California's demographic development, led to more than a ten-fold increase in its population between 1940 & 1970 - from 80 to 870 thousand, and was prompted and sustained by a set of four factors. First and foremost, there was the large scale agriculture land reform program that expropriated land from the foreign land companies and gave property or possession to Mexican nationals.

This program, which involved close to 700 thousand acres of irrigated land, was accompanied by several complementary actions that had the stated intention of increasing the population of the area, including the construction of road and rail-road links with the peninsula, the establishment of the highest minimum-wage level within the country, and the creation of a free international trading zone that allowed for the duty-free importation of consumer and production goods, played a major role in accomplishing the stated demographic goal (Sandez:1988).

Other important elements in this second phase of inmigration stem from; the international agreement signed in the early 1940s - better known as the 'Bracero Program'- by means of which Mexico supplied the labour force that the American economy demanded during its participation in both World War II and the Korean War; the deployment of large-scale American military installations and personnel in the Los Angeles and San Diego areas of California, which gave a further boost to the 'entertainment-services' of the west coast of the state, and; the repatriation process of those Mexicans that had been involved in the Bracero Program up to the end of the bilateral international agreement at the beginning of 1965.

The fourth feature of Baja California's process of population that we wish to underline is one that covers the two decades that started in 1970. The major point to note about this period is that, according to the 1980 Census figures, Baja California's population for the first time in this century grew at a lower rate than that of the whole country between 1970 & 1980.

Apart from the fact that some of the 1980 Census figures have been seriously criticized (Corona:1986), there are two additional factors that allow one to seriously doubt and challenge the demographic trends for Baja California implied by these census figures.

Firstly it should be noticed that along with the termination of the Bracero Program in 1965, there was the emergence of two new processes that directly influenced migration flows to and from the state. The first of these was the international flow of undocumented or illegal workers from Mexico into the United States of America, of increasing magnitude which has been widely documented (Bustamante:1975 & 1983. Passel & Woodrow:1984), from which Baja California as a transit area has received inmigrants both from those trying to get into America, and also from those who are sent back to the state once they are apprehended and deported (CONAPO: 1985).

The second process that was promoted with the end of the Bracero Program, is that of the creation of an 'in-bond' production area in the Mexican northern border cities. This program which involves the installation of mainly foreign-owned labour-intensive assembly plants within Mexico, is based on a fiscal policy of the American Government by means of which the goods re-imported from the in-bond plants are only taxed on the newly value-added component of their cost. In spite of functioning since 1965, this program - better known as the 'maquiladora' program - really gathered pace from 1976 onwards when the 100% devaluation of the Mexican peso in relation to the American dollar made Mexican labour a real bargain, since then an hour's wage in America will buy at least a day of labour in Mexico.

By the end of 1987 there were approximately 1250 in-bond assembly plants in Mexico and more than 500 were located in Baja California. At that point in time this industry generated almost 314,000 jobs and close to 40.0% of these plants were in Baja California, with the additional characteristic that at least 80.0% of these employees were women. In other words nearly 50 thousand women were working at the maquiladora industry in Baja California at the end of 1987 (Kerber & Ocaranza:1989. Sandez:1988).

Since 1986 a more accurate assessment of population movements in the state has been possible. From that date onwards a Continuous Migration Survey has been carried out in Baja California (CONEPO-BC:1989), and from the most recent available data we have computed the series of rates that are presented in Tables 2.2.1 and 2.2.2.

It can be seen that contrary to what the 1980 Census results indicated, there seems to have been a positive net-migration balance for the state during the last 20 years, although of a decreasing proportional magnitude when compared to that of the previous decade.

On the whole then, what we would like to emphasize are the facts that Baja California has been and still is an attraction area for internal migrants, and that since the Federal Government has set at the top of their economic priorities the further development and consolidation of the maquiladora industry as a means of increasing badly-needed foreign-currency earnings, inmigration is likely to continue in the foreseeable future.

TABLE 2.2.1
BAJA CALIFORNIA: TOTAL & MUNICIPAL CBR & CDR (1960-1989).

AREA	C.B.R. (o/oo) 60-70	70-80	70-89	C.D.R. (o/oo) 60-70	70-80	70-89
B.C.TOTAL	46.67	40.03	32.01	7.75	6.55	5.26
ENSENADA	44.09	38.64	33.90	7.68	6.76	6.19
MEXICALI	45.98	38.75	31.40	7.49	6.12	5.03
TECATE	45.73	36.39	31.15	8.23	5.56	5.00
TIJUANA	49.15	42.24	32.11	8.20	7.02	5.21

Source: Computed from, **CONAPO (1987a). Secretaria de Industria y Comercio;** **VII, VIII, & IX Censos Generales de Poblacion y Vivienda**. Mexico, D.F. **CONEPO-BC;** **Encuesta Continua de Migracion de Baja California, 1989**. Mexicali.

TABLE 2.2.2
BAJA CALIFORNIA: TOTAL & MUNICIPAL GROWTH RATES.
(1960-1989)

PERIODS AND YEARLY RATES	A R E A				
	B.C.	ENSENADA	MEXICALI	TECATE	TIJUANA
1960-1970					
TOTAL GROWTH	5.52	6.19	3.64	8.60	7.81
NATURAL GROWTH	3.89	3.64	3.85	3.75	4.09
SOCIAL GROWTH	1.63	2.55	-0.21	4.85	3.72
1970-1980					
TOTAL GROWTH	2.94	4.10	2.46	5.15	2.95
NATURAL GROWTH	3.35	3.19	3.26	3.08	3.52
SOCIAL GROWTH	-0.40	0.91	-0.80	2.07	-0.57
1970-1989					
TOTAL GROWTH	3.68	3.47	3.21	4.49	4.20
NATURAL GROWTH	2.68	2.77	2.64	2.61	2.69
SOCIAL GROWTH	1.00	0.70	0.58	1.87	1.51

Note.- Social Growth = Total Growth - Natural Growth.
Source: Computed from, **CONAPO (1987a). Secretaria de Industria y Comercio;** **VII, VIII, & IX Censos Generales de Poblacion y Vivienda**. Mexico, D.F. **CONEPO-BC;** **Encuesta Continua de Migracion de Baja California, 1989**. Mexicali.

2.2.2.- Mortality.

The purpose of this section is to describe and analyze the mortality levels, patterns and trends for Baja Californian population. In doing so our aim is to define the mortality context in which the population's fertility behaviour has been taking place.

Within the demographic literature the relationship between mortality and fertility has been a major concern when dealing with modern populations. This relationship played a central role in the initial formulation of demographic transition theory since, broadly speaking, it suggested that a mortality reduction would eventually lead to a fertility reduction (Notestein:1959).

Further elaborations of the theory and empirical research on the relationship between mortality and fertility, have clarified two broad areas where the physiological effects of mortality variation may result in short-term fertility modification.

The first of these is the influence that adult mortality has upon fertility by its impact on union-duration. In this area, for instance, it has been suggested and partially confirmed by indirect evidence that an adult mortality decline may cause a rise in fertility - by increasing the age at widowhood/widowerhood and therefore by increasing the duration of married life of couples - even when the fertility behaviour of couples within marriage does not change (Nag:1980).

The second general area where the effects of mortality upon fertility have been identified is that of the impact of variation of child mortality on fertility. The physiological or interval effect of infant mortality, is the modification of the interval to the next birth that a child's death brings about. In populations where conscious limitation of family size is negligible the most noteworthy interval effects operate through lactation, since breast-feeding would be terminated if a nursing child dies; its death may hasten the return of ovulation and consequently speed the arrival of the next birth (Preston: 1978).

With these two considerations in mind, we now describe the levels and trends of both female adult and child mortality of Baja California's population.

2.2.2.1.- Female adult mortality.

The patterns of migration towards Baja California, that we have described in subsection 2.2.1, took place during a period in which the state itself was undertaking a major demographic transformation.

In order to give an idea of those changes we have included Table 2.2.3 which contain the available information for female adult mortality rates pertaining to the period from 1950 to 1981, for which vital registration and census information is available[8].

The information of Table 2.2.3, which is also depicted in Figures 2.2.1 & 2.2.2, allows one to see the significant improvements that women of all reproductive ages have experienced in Baja California during the second half of this century.

A first point to notice is that for every age-group of women of reproductive ages, there is a clear downward trend in the level of female adult mortality (See, Figure 2.2.1).

The reductions in the level of mortality that those trends depict show that by the early 1980s the female Age Specific Mortality Rates (ASMRs) values of every age-group have been at least halved from the highest values that they reached during the 1950s.

Within this significant improvement in mortality of women of reproductive ages, however, there are also some indications that the proportional gains of different age-groups have not been uniform. The information shows that there have been much higher proportional improvements in the mortality of younger women that for older age-groups and that, there seems to be an almost monotonic decreasing trend in the proportional reduction of mortality as one moves from the older to the younger groups of women.

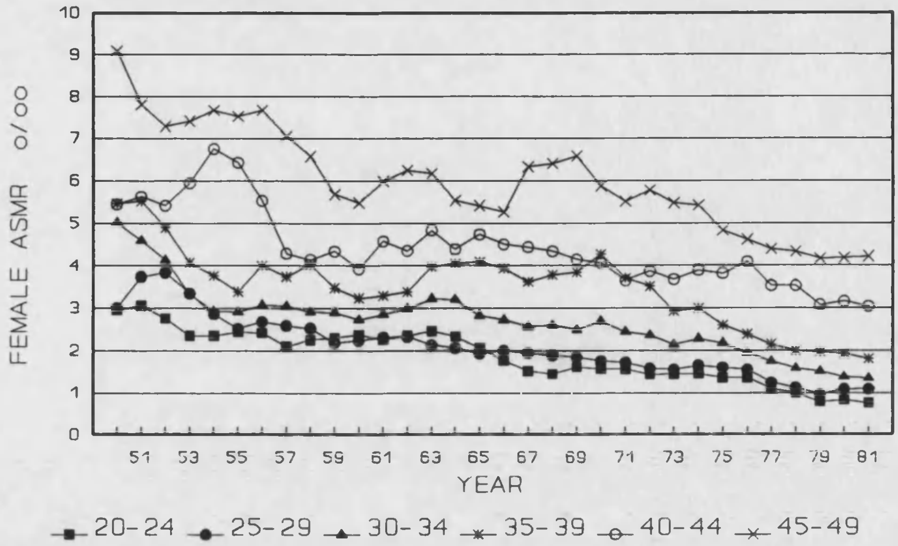
8.- See Subsections 2.2.2.2 & 2.2.3.1 below, for the basic factors concerning the quality of Baja California's vital registration data.

TABLE 2.2.3
B.C.: A.S.FEMALE MORTALITY RATES BY YEAR (3 Year Mvg.Avg.), 1950-1981.

YEAR	AGE GROUPS 15-19	20-24	25-29	30-34	35-39	40-44	45-49
1950	.00277	.00295	.00301	.00501	.00546	.00545	.00908
1951	.00269	.00306	.00373	.00459	.00551	.00562	.00781
1952	.00255	.00276	.00384	.00413	.00489	.00541	.00728
1953	.00221	.00235	.00335	.00332	.00406	.00593	.00741
1954	.00172	.00235	.00286	.00294	.00376	.00676	.00767
1955	.00140	.00244	.00252	.00291	.00338	.00643	.00753
1956	.00134	.00242	.00268	.00307	.00400	.00553	.00767
1957	.00131	.00210	.00258	.00304	.00373	.00428	.00706
1958	.00127	.00225	.00252	.00290	.00402	.00414	.00657
1959	.00109	.00230	.00219	.00289	.00347	.00434	.00567
1960	.00105	.00237	.00224	.00273	.00324	.00391	.00548
1961	.00109	.00226	.00232	.00285	.00329	.00457	.00598
1962	.00113	.00235	.00232	.00298	.00338	.00435	.00624
1963	.00122	.00246	.00213	.00322	.00397	.00483	.00617
1964	.00123	.00233	.00207	.00320	.00404	.00438	.00552
1965	.00115	.00206	.00193	.00283	.00408	.00474	.00540
1966	.00095	.00176	.00200	.00272	.00392	.00449	.00525
1967	.00077	.00151	.00194	.00256	.00362	.00443	.00632
1968	.00081	.00145	.00189	.00260	.00378	.00433	.00640
1969	.00087	.00161	.00184	.00249	.00384	.00414	.00658
1970	.00094	.00157	.00175	.00269	.00425	.00405	.00586
1971	.00101	.00156	.00171	.00244	.00370	.00364	.00551
1972	.00113	.00143	.00158	.00236	.00350	.00386	.00577
1973	.00116	.00144	.00155	.00213	.00292	.00367	.00546
1974	.00101	.00145	.00164	.00228	.00299	.00389	.00541
1975	.00093	.00135	.00159	.00218	.00259	.00381	.00483
1976	.00086	.00135	.00155	.00193	.00238	.00408	.00460
1977	.00085	.00109	.00123	.00174	.00214	.00352	.00438
1978	.00074	.00099	.00112	.00157	.00199	.00352	.00432
1979	.00066	.00079	.00095	.00150	.00196	.00307	.00416
1980	.00064	.00082	.00108	.00137	.00192	.00315	.00417
1981	.00057	.00076	.00109	.00134	.00180	.00304	.00421

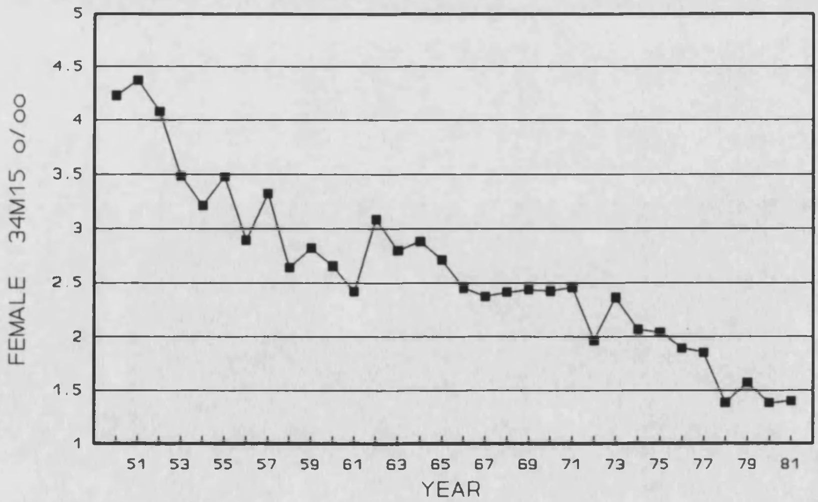
Source: Computed from, **CONAPO** (1987a) **Secretaria de Industria y Comercio; VII, VIII, & IX Censos Generales de Poblacion y Vivienda**. Mexico, D.F. **CONEPO-BC, CRIM-UNAM, & IIS-UABC** (1987) **Encuesta Demografica de Baja California, 1986**. Consejo Estatal de Poblacion. Mexicali, B.C.

Fig.2.2.1.- B.C. FEMALE ASMRs 1950-1981.
Vital Registration data (3 year moving average).



Source: Table 2.2.3.

Fig.2.2.2.- B.C. FEMALE 15-49 Mortality Rates.
1950-1981 Vital Registration data (3 year moving average).



Source: Table 2.2.3.

On the whole, however, these improvements have not altered the basic general pattern of female adult mortality. Here, as expected, for all the years included in the period under consideration (with only a few brief exceptions) the female ASMRs values depict a monotonic improvement with age.

These age-specific improvements in mortality have resulted in a clear trend of reductions in the overall level of mortality for women of reproductive ages. Figure 2.2.2 shows that the female mortality rate for the 15 to 49 age-group has been reduced in more than 60.0% during the period from 1950 to 1980.

It also should be noted, lastly, that within the trend of reduction of the level of mortality for the whole group of women of reproductive ages, there seems to be three differentiated stages which seem to coincide with the three decades included within the period under consideration. Looking at each of those three decades, the 1960s seems to show little or no overall mortality improvement, while the 1950s and 1970s data depict a much clearer downward trend of mortality.

2.2.2.2.- Infant mortality.

As in the case of the previous subsection, in order to analyze the pattern, levels, and trends of infant mortality we use the available information on births and deaths for the period 1970-1980 from the Civil Registration System of Baja California's state Government. For this purpose, the Infant Mortality Rate (IMR) in its version of ${}_1M_0$ has been used.

In relation to the quality of the data used for computing the IMR, we would like to underline that - apart from the particular socio-economic characteristics of Baja California (see Section 2.3) which are quite favourable for the quality of the vital registration system (VRS) data - it has been observed that in the specific case of infant mortality the level of registration completeness has been increasing over time for the country as a whole (Aguirre & Camposortega: 1980. Cordero:1968).

For example, when IMR estimates from the Mexican Fertility Survey (MFS) were compared with those from the VRS it was concluded that, aside from "the sizeable difference in neonatal mortality (which) is to a slight extent compensated for by greater mortality in months 1 & 2 that may result from exaggerating age at death in vital registration...the similarity between the sources of probabilities of death in the remaining months (i.e 1 to 11) is remarkable, to say the least" (Ordorica & Potter:1981;26).

It should be noted, furthermore, that a state by state evaluation of the level of infant mortality omission in the VRS data found that for the specific case of Baja California - and among other states of northern Mexico (see Section 2.3.1) - the ${}_1q_0$ estimates obtained using a model life-table relation between ${}_4q_1$ and ${}_1q_0$, were lower than those computed from the direct VRS information for the period from 1950 to 1965, a result which indicated very low or non-existent levels of omission (Cordero:1968).

Therefore, assuming that those levels of omission have not deteriorated over time, we have used the VRS information to compute the results presented in Table 2.2.4, and depicted in Figures 2.2.3 and 2.2.4. The first of those figures shows two major features of the infant and childhood mortality characteristics for Baja California's population.

First, one should notice that against a background of a total number of births that have been fluctuating between 37 to 44 thousand per annum during the period from 1970 to 1980 - except for an unexpected upsurge between 1973-1976 that has been associated with a Federal Government Program that encouraged legal marriages for couples in long-term consensual unions as well as the legal registration of their children - the number of child and infant deaths have been decreasing from around 2,900 and 2,500 respectively in 1970, to around

1,400 and 1,200 by 1980.

A second major feature of Figure 2.2.3 and Table 2.2.4, is the trend of the proportion of infant deaths (i.e. under 1 year of age) to the total deaths of children under the age of 5. In this case one can observe that the proportion has been close to 85.0% during the period 1970 to 1980.

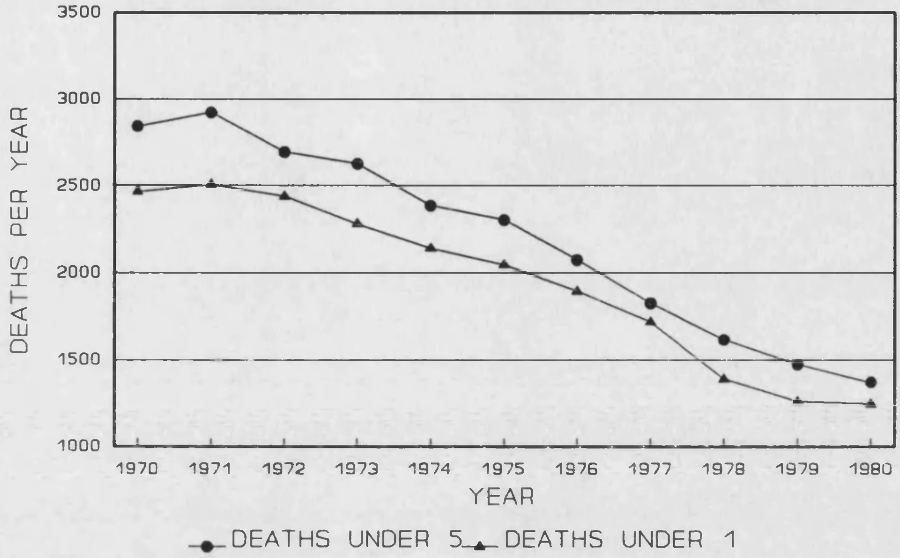
TABLE 2.2.4
B.C.: BIRTHS, INFANT AND CHILD DEATHS, 1970-1980.
(3 year moving averages).

Year	Births	DEATHS < 1	DEATHS < 5	% (<1/<5)	1M0
1970	38660	2445	2843	0.86	0.0633
1971	40415	2494	2923	0.85	0.0617
1972	43434	2321	2694	0.86	0.0534
1973	44434	2249	2626	0.86	0.0506
1974	43864	2059	2385	0.86	0.0469
1975	40998	1991	2304	0.86	0.0486
1976	39102	1778	2074	0.86	0.0455
1977	37077	1554	1825	0.85	0.0419
1978	37043	1356	1616	0.84	0.0366
1979	37479	1241	1473	0.84	0.0331
1980	37077	1150	1370	0.84	0.0310

Source: CONAPO (1987a).

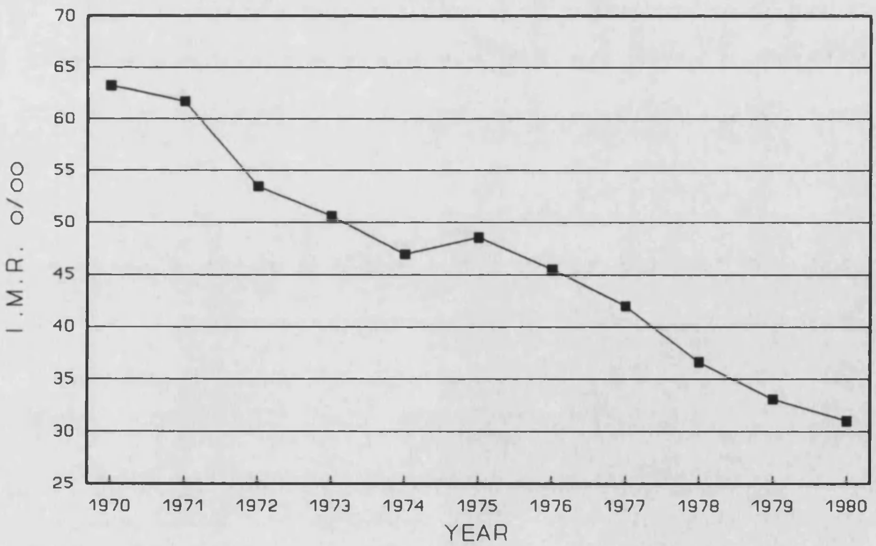
Such high proportions of infant relative to childhood deaths have been usually associated with mortality patterns in the developed areas of the world. For instance, a recent United Nations study on child mortality stated that "..in the more developed regions, child mortality is low relative to infant mortality and, on average, less than 20 per cent of deaths under 5 occur at ages 1-4. In the less developed regions, the estimated child mortality is higher relative to infant mortality. On average, 34 per cent of deaths under 5 are estimated to occur at ages 1-4" (U.N.: 1988;24).

Fig.2.2.3.- B.C. Infant and Child Deaths, 1970-1980.
Both Sexes, Vital Registration data (3 years moving averages).



Source: Table 2.2.4.

Fig.2.2.4.- B.C. Infant Mortality Rate, 1970-1980.
BOTH SEXES, Vital Registration data (3 years moving average).



Source: Table 2.2.4.

In the case of Mexico as a whole, data from the source cited above allow us to estimate that almost 30 per cent of the child mortality occurred at ages 1-4 during the period 1975 to 1980, since the values for $_1q_0$ and $_5q_0$ were estimated at 60o/oo and 85o/oo, respectively (Ibid;32,38).

A further point to underline is that, at least from the available data, there is a clear indication that there has been a noticeable improvement in the level of the IMR in Baja California during the 1970s since as Figure 2.2.4 shows, the IMR has gone down from almost 64 per thousand to under 32 per thousand over that decade.

Therefore, the foregoing information supports the suggestion that not only has the pattern of childhood mortality in Baja California been markedly different from that of Mexico as a whole at least during the period 1970-1980, but also that during that same period there has probably been a different pattern of modification in the level of infant mortality in the state.

In order to assess the latter statement we now turn our attention to the data presented in Table 2.2.5. In this table, which has been constructed from data computed by Mina, (1988), we have combined the information on IMR obtained from the vital registration system (VRS) data (i.e. $_1M_0$) with that provided by the application of an indirect estimation technique (Feeney: 1975) for both Mexico as a whole, and for the state of Baja California.

Data from Table 2.2.5 seem to suggest, on the one hand, that as was mentioned above the level of infant mortality omission in the VRS data for Baja California has been decreasing over time. The apparent reversal between 1976 and 1978 in the otherwise decreasing trend of the IMR that the indirect estimation suggest, can be associated with the lack of compliance with the assumptions implicit in the Brass-derived indirect estimation technique. That is to say, that in its original design this technique assumes unchanged fertility and mortality (Brass & Coale:1968). When the first of those assumptions is not met - and as can be seen below (subsection 2.2.3.1) fertility has been declining in Baja California since the early 1960s - it has been pointed out that the estimates of infant and child mortality would be over-estimated (Ibid;114-115). In the second case, furthermore, Feeney (1980) has demonstrated that "differential infant mortality by age of the mother...(can bias)...the value of the 20-24 age group estimate upwards (Ibid;126), as seems to be the case in the estimates for Baja California, since the estimates of IMR for 1978 are based on the infant mortality experienced by children born to women in that particular age group (i.e. 20-24).

The data from that same table, on the other hand, also seem to suggest that (regardless of the measurement used) the levels of infant mortality had been lower in Baja California than in Mexico as a whole since 1965, and also that the proportional gains in infant mortality have been higher for the state than for the whole country.

The results of the foregoing analysis indicate, therefore, that both on the grounds of female adult mortality improvements during the period 1950-1980, and on the reductions of infant mortality that have been documented for the period between 1965 to 1980, one could reasonably expect that fertility would have been affected.

It should be noted, however, that the expected direction of the effects of female and infant mortality improvements run in the opposite direction, since the former would tend - other things been equal - to increase the length of the effective reproductive span of women, thus leading to an increase in fertility, while the latter would tend - also other things been equal - to increase the length of the birth intervals, and therefore to reduce fertility.

TABLE 2.2.5
MEXICO and B.C.: INFANT MORTALITY RATES.
(V.R.S. & 1980 CENSUS DATA)

YEAR	1MO		FEENEY'S IMR	
	MEXICO	B.C.	MEXICO	B.C.
1965		62.7		87.1
1966	62.9		105.1	
1967				
1968		57.6		65.9
1969	66.7		85.2	
1970				
1971		60.0		60.3
1972	60.9		77.7	
1973				
1974		50.8		55.5
1975	48.8		71.0	
1976		48.2		50.5
1977	48.8		69.3	
1978	39.8	30.4	72.5	54.4

Source: **Mina, V.A.** (1988) 'La medicion indirecta de la mortalidad en Mexico'. In: Bronfman,M. & Gomez de Leon (eds), **La Mortalidad en Mexico: niveles,tendencias y determinantes**. El Colegio de Mexico. Mexico, D.F. (pp.273-306).

Having described the mortality improvements that have affected the females of reproductive ages and the infant population of Baja California, the following section will address the issue of the fertility trends, patterns, and levels that have been developing in the state during that period.

2.2.3.- Fertility.

The main purpose of this section is to present and analyze the trends, patterns and levels of fertility for Baja California's population. In this case our central aim is that of defining the context in which we will later analyze the reproductive patterns of both the native and migrant population of this area of Mexico.

Thus in what follows we present the results of an analysis based mainly upon two types and sources of information. First we have used the time-series of annual registered births from the Vital Registration System (VRS) of Baja California (CONAPO:1987a), and the five-year age groups of female population from the 1950 to 1980 censuses and the corresponding weighted estimates from the 1986 Baja California Demographic Survey (BCDS), to generate annual estimates of the Age Specific Fertility Rates (ASFR) by five-year age groups and of the Total Fertility Rate (TFR) for the period between 1950 and 1982.

In the second case, resorting mainly to indirect techniques of data evaluation and estimation, we have analyzed the 1986 BCDS data in order to check both the consistency between the different data sources (VRS, Censuses, and BCDS) and the quality of the BCDS data itself[9], and also to generate the most up to date estimates of the patterns and level of fertility for Baja California.

2.2.3.1.- Fertility trends.

In Mexico, birth registration has been compulsory since 1859 and although it has been established that it has been affected by incompleteness and late registration, it also has been noticed that both of these problems have been

9.- See, Annex 'A', for a full description on the data quality analysis of the 1986 BCDS.

decreasing with time (Ordorica & Potter:1981). In this respect, furthermore, when ASFRs obtained from the maternity histories from the 1976-77 Mexican Fertility Survey (MFS) were compared with those calculated from registered births, it was demonstrated that while there were some positive - but monotonically decreasing with age - differences in favour of the MFS especially at younger age groups (15-19), the level of TFR computed from both sources was in the order of 6.49 and 6.29 from the MFS and the VRS respectively, indicating a difference of 3.1% between the two estimates for the period 1971-1972.

Taking into consideration that the above mentioned figures relate to the total population of the country and that, as it will be pointed out in the following Section (i.e.Section 2.3), Baja California's population has been characterized by higher living standards than those of most of the rest of Mexico's population - in areas closely related to the VRS effectiveness such as literacy, educational attainment, female economic activity participation, income level, urbanization, and so on - and, finally, that the mere fact of living on the Mexican side of the international border brings about an additional incentive to acquire and utilize the documents provided by the official VRS, we can assume with some degree of confidence that the information of registered births for Baja California's population shall be of higher quality than that of the country as a whole.

Keeping in mind the assumption already mentioned in relation to the expected quality of Baja California's VRS data, we begin our analysis by presenting Figure 2.2.5 which depicts the number of male, female, and total births registered during that period 1950-1980, based on three-year moving averages.

A first point to notice from Figure 2.2.5, is that of the expected and sustained relation between the numbers of male and female registered births for the whole period under consideration. Throughout this period the corresponding lines depict a positive, although variable, male to female ratio of registered births, which in turn indicates that whatever the level of under-registration (if any) it is not likely to be sex-selective.

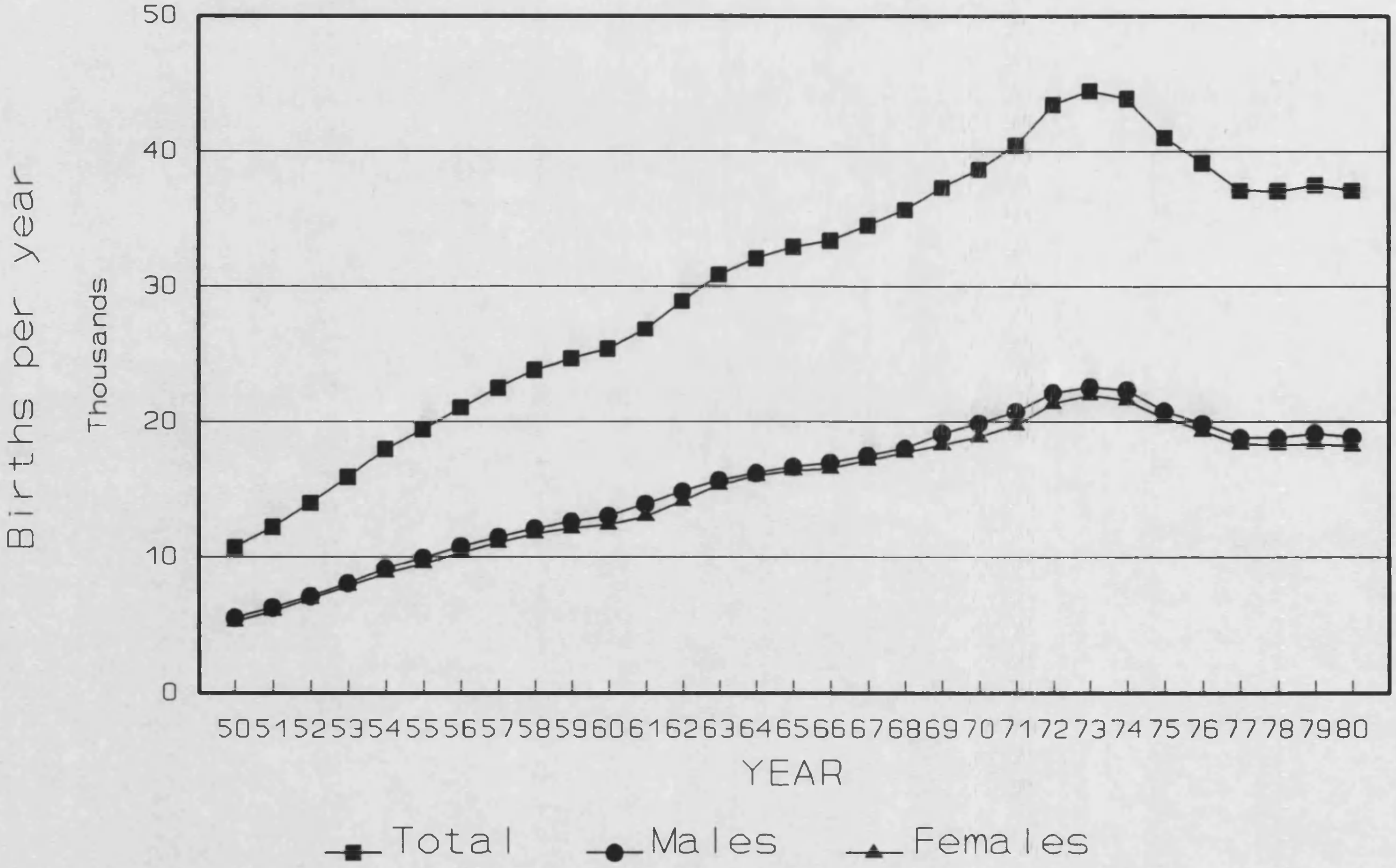
The second feature that Figure 2.2.5 allows us to underline is the one related to the relative 'smoothness' of the total number of registered births, except for the early period of the 1970s. As mentioned before (Section 2.2.2.2), the upsurge in the numbers of registered births between 1972 and 1975 has been related mainly to "..a national programme that promoted the legalization of marriages of couples living in consensual unions as well as the inclusion of their children in the civil register..(which in turn)..may have led to some duplicate registration" (Ordorica & Potter:1981;22).

Aside from that specific period, a third point to be observed is that Figure 2.2.5 indicates a sustained increase of births from nearly 10,000 in 1950 to about 40,000 in 1970, and that from the latter year onwards the number of registered births fluctuates between 35 & 40 thousand per year during the late 1970s and early 1980s, indicating the beginning of a period of relative stabilization in the number of births in Baja California.

Based on a 3 year moving average number of registered births and the estimated mid-year female population by five-year age groups from the 1950 to 1980 censuses and from the 1986 BCDS weighted data, we have computed the ASFRs and TFR presented in Table 2.2.6 and depicted in Figure 2.2.6.

From this information a first point to note is the upward trend of the TFR during most of the 1950s decade in Baja California. This trend, seems to have originated further back in time than the period that we are considering here, but on the whole it closely resembles the trends of Mexico's total population when both Crude Birth Rate (CBR) time-series and MFS's birth histories data were analyzed (Dyson & Murphy:1985).

Fig. 2.2.5.- B.C. Total, male, and female births 1950-1980.
Vital Registration data (3 years moving average).



Source: CONAPO (1987a).

This first period of the trend presented for Baja California's TFR seems to represent what Dyson & Murphy, (1985) have defined as the 'unprecedented level predecline peak' of fertility at the onset of the fertility transition (Ibid;417,432).

In order to assess such a possibility we have applied the algorithm defined by those authors in their analysis of turning points in fertility trends (Ibid.;415, 438), and the results indicate that up to 1957 the TFR for Baja California was on a rising phase - with the highest peak located around 1956 - and that from 1958 onwards fertility has been in a sustained falling phase. This result, we may add, coincides almost to the year with the analysis that the authors have made for Mexico's CBRs series (Ibid;416).

Therefore, leaving aside the weak cycles and spurious fluctuations for Baja California's TFR trend in the early 1960s and 1970s respectively, the second major feature of the data presented in Table 2.2.6 is that of the definition of four major phases in the fertility trends of Baja California's population: a) An initial phase of increasing fertility - already mentioned - that spanned at least the period 1950 up to 1957; b) A second phase of sustained and pronounced fertility decline which took place between 1958 and 1967; c) A third phase in the period 1968 to 1972, during which fertility was relatively 'stable' but within a moderate declining trend, and; d) A fourth phase of sharp and accelerated fertility decline that started around 1973 and that seems to have continued up to 1982 at least.

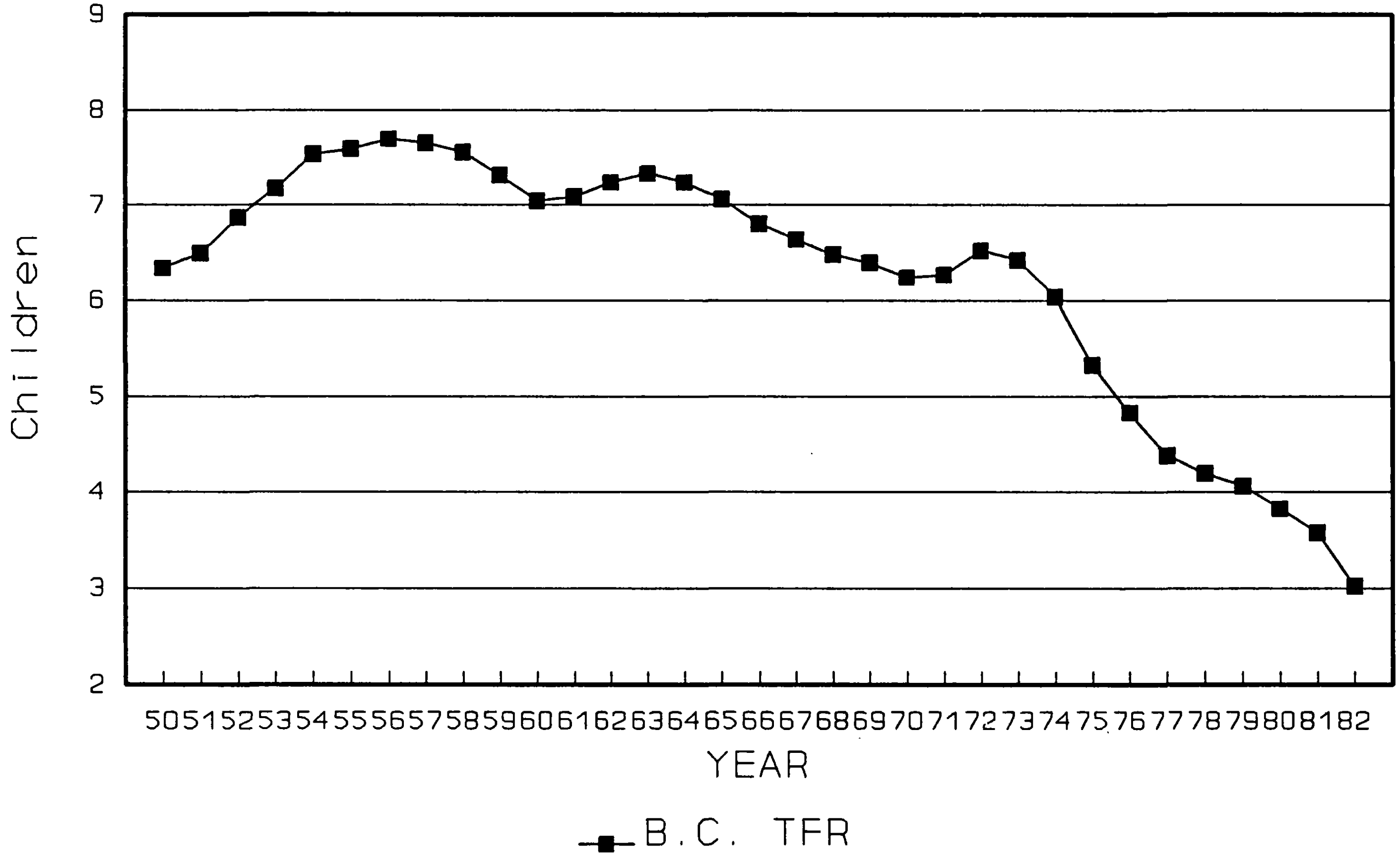
In order to illustrate the different magnitude and speed of change that characterized each of these four phases, we have computed the proportional change of the absolute value of the TFR from the beginning to the end of each of those phases, and also the annual rate of change of the TFR. In the first phase the TFR increased 20.6%, at an annual rate of 2.7%; from 1958 to 1967 the TFR decreased at an annual rate of -1.6% which involved a reduction of 13.2%;

TABLE 2.2.6
B.C.: AGE SPECIFIC FERTILITY RATES & TFR BY YEAR 1950-1982.
(Births 3 Year Mvg.Avg.).

YEAR	AGE GROUPS 15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
1950	.1233	.3086	.3000	.2385	.1601	.0695	.0666	6.3
1951	.1258	.3233	.3112	.2419	.1623	.0899	.0433	6.5
1952	.1339	.3543	.3344	.2583	.1651	.1061	.0211	6.9
1953	.1412	.3883	.3546	.2758	.1700	.1043	N.A.	7.2
1954	.1445	.4159	.3764	.2967	.1796	.0932	N.A.	7.5
1955	.1418	.4196	.3829	.3011	.1897	.0810	N.A.	7.6
1956	.1367	.4193	.3896	.3097	.1996	.0824	N.A.	7.7
1957	.1331	.4278	.3864	.2987	.2003	.0822	N.A.	7.6
1958	.1264	.4271	.3783	.2918	.2013	.0850	N.A.	7.6
1959	.1180	.4139	.3632	.2812	.2021	.0839	N.A.	7.3
1960	.1085	.3884	.3452	.2782	.2002	.0877	N.A.	7.0
1961	.1033	.3731	.3490	.2883	.2073	.0958	N.A.	7.1
1962	.1035	.3722	.3610	.2992	.2080	.1029	N.A.	7.2
1963	.1009	.3694	.3730	.3035	.2099	.1086	N.A.	7.3
1964	.1009	.3498	.3657	.3012	.2088	.1198	N.A.	7.2
1965	.0988	.3287	.3547	.2891	.2109	.1282	N.A.	7.1
1966	.0952	.3070	.3351	.2818	.2086	.1306	N.A.	6.8
1967	.0912	.3021	.3291	.2760	.2053	.1207	N.A.	6.6
1968	.0877	.2934	.3210	.2741	.1992	.1164	N.A.	6.5
1969	.0880	.2883	.3220	.2683	.1960	.1118	N.A.	6.4
1970	.0894	.2833	.3197	.2542	.1832	.1135	N.A.	6.2
1971	.0962	.2862	.3158	.2529	.1800	.1066	.0132	6.3
1972	.1016	.2849	.3147	.2623	.1940	.1126	.0312	6.5
1973	.1013	.2731	.3000	.2628	.1956	.1050	.0434	6.4
1974	.0994	.2586	.2823	.2402	.1839	.0999	.0393	6.0
1975	.0957	.2412	.2542	.2047	.1535	.0823	.0307	5.3
1976	.0933	.2241	.2337	.1798	.1356	.0710	.0263	4.8
1977	.0864	.2066	.2140	.1610	.1201	.0617	.0242	4.4
1978	.0827	.2003	.2070	.1559	.1124	.0550	.0228	4.2
1979	.0799	.1967	.2025	.1523	.1060	.0518	.0207	4.1
1980	.0792	.1904	.1922	.1441	.0953	.0452	.0163	3.8
1981	.0816	.1861	.1826	.1294	.0824	.0385	.0120	3.6
1982	.0749	.1642	.1581	.1076	.0647	.0271	.0068	3.0

Source: Computed from, **CONAPO** (1987a). **Secretaria de Industria y Comercio;** <u>**VII, VIII, & IX Censos Generales de Poblacion y Vivienda**</u>. Mexico, D.F. **CONEPO B.C., CRIM-UNAM, & IIS-UABC** (1987) <u>**Encuesta Demografica de Baja California, 1986**</u>. Consejo Estatal de Poblacion. Mexicali, B.C.

Fig.2.2.6.- B.C. Total Fertility Rate 1950-1982.
V.R.S. Births (3 Year moving averages).



Source: Table 2.2.6.

during the third phase the TFR was reduced by only 4.6% at an annual rate of -1.2%, and; for the phase starting in 1973 the TFR decreased a 50.8% at an annual rate of -7.6%.[10]

2.2.3.2.- Fertility patterns.

Once it has been established that at least since the early 1960s fertility has been in a downward trend in Baja California, we now turn attention towards the impact that such decline has had upon age-specific fertility patterns. In order to do so, based upon data for the ASFRs by five-year age groups, we have constructed Figure 2.2.7 which depicts the ASFR time trends for six of the seven age groups included in Table 2.2.6 (i.e. 15 to 44).

Resorting to the four phase periodization previously described for the TFR trend, one is able to observe a set of distinctive patterns of behaviour in the age groups included in Figure 2.2.7. For instance, in the case of the first phase of the fertility trend - that of increasing fertility between 1950 and 1957 - the youngest age group of the age range included (15-19), although with some fluctuations, does not seem to have had a strong participation in the fertility increase of this period, since their ASFRs values at the beginning and at the end of this phase increased only 8.1%, which indicates a less than average proportional increase in their ASFRs values.

However, during this same phase, the remaining five age groups increased their ASFRs values in proportions that

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10.- The TFR values for the years 1972 and 1973 used in the computation of the per cent change and of the annual rates of change were obtained by graphical interpolation on Figure 2.2.6 - and estimated to be in the level of 6.2 and 6.1, respectively - in order to avoid the spurious fluctuation resulting from the official registration program already mentioned above.

monotonically declined with age within the range of 38.6% for the 20-24 age group to 18.8% in the case of the 40-44 age group.

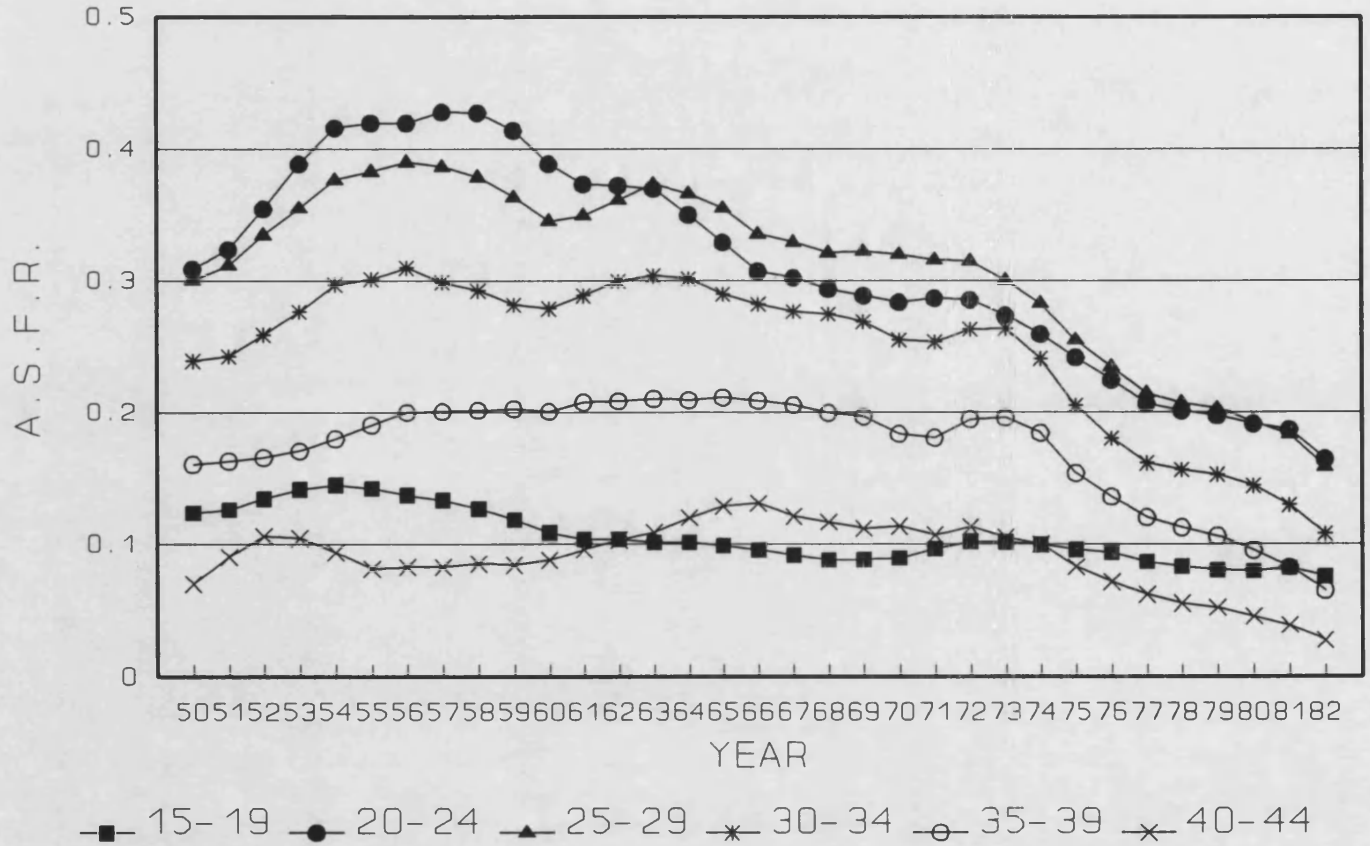
Such large relative fertility increments in that age range seem to suggest that during this period, factors related to modernization were operating in the form of mechanisms such as increases in the proportions of ever married women and reductions in the mean age at marriage, particularly for the 20-24 and 25-29 age groups; reductions in the proportions and duration of children being breast-fed and, reductions in the proportions of widows remaining outside of union due to mortality improvements, especially for women included in the 30 to 44 age range.

In the case of the second phase of the fertility trend - in which sustained and pronounced fertility declines were observed between 1958 and 1967 - there are three well defined patterns of behaviour for the ASFRs trend. First of all, the ASFRs of the 30-34 and 35-39 age groups depict very much a picture of relative stability during this period, since their ASFRs values during this phase decreased to 94.5% and increased to 102.0%, respectively.

The second pattern that characterizes this period is the increasing fertility trend depicted by the values of the ASFRs for the 40-44 age group, which is the only group with increasing fertility during this phase. In our view, such a pattern may indicate the possible lagged effects of mortality improvements upon the proportions of women entering widowhood, and of widows remaining outside second or higher order unions.

Last but not least, the third characteristic pattern of this phase involves the three youngest age groups of the time series, and clearly depicts a prolonged and notable fertility decline. For the 15-19 age group the proportional ASFR decline was 27.8%; for the 20-24 age group the decrease was 29.3%, and for the 25-29 age group the reduction was 13.0%.

Fig.2.2.7.- B.C. Age Specific Fertiltiy Rates 1950-1980.
V.R.S. (3 Year moving averages).



Source: Table 2.2.6.

As in the previous phase, the fact that this trend affected exclusively the youngest age groups seems to indicate that at the onset of fertility decline in Baja California, the factors that played a major role were those related to the decline in the proportions ever married at early ages and the increase of the age at marriage, as the cross-over between the lines of ASFRs for the 20-24 and 25-29 seems to indicate in Figure 2.2.7.

The third phase of the fertility trend - between 1968 & 1972, characterized by relative fertility stability but within a declining trend - is one in which almost completely homogeneous fertility behaviour can be observed, as all but one of the ASFRs series depicts a declining path. At this stage only the 15-19 age group shows a relatively small fertility increment from 0.088 to 0.102, while the five remaining groups reduced their levels of ASFRs between 1.9% and 4.4%.

Finally the fourth stage of the fertility trend - in which fertility declines rapidly and sharply between 1973 and 1982 - depicts a picture very much consistent with the widespread introduction of modern fertility control methods since, on the one hand, all the time series indicate a homogeneous declining path on the values of the ASFRs for the six age groups involved and, on the other hand, the groups that show a more pronounced decline are the 30-34, 35-39 and 40-44 age groups with decrements in their ASFRs of the order of 55.2%, 64.8% and 73.0%, respectively.

The effects of these four phases upon the shape of the fertility curve can be seen in Figure 2.2.8 which presents the ASFRs values of the seven age-groups (when available) for five selected years. Major features in Figure 2.2.8 are the magnitude of the fertility decline, especially for the 20 to 34 age range, and the change from an early and uni-modal shape to a quasi bi-modal and hence older shape in the fertility pattern.

On the whole, from our perspective, the changes in the fertility pattern that have been observed between 1958 and 1981 can be associated with two major factors that seem to have had a differential effect on the fertility of the age group. The first factor that we can identify is that of the downturn that characterized Baja California's economic structure during the late 1950s and 1960s (a period which involved an agriculture crisis due to the lack of demand for the main product of the area which used to be cotton, after the 'boom' years generated by the World War II and Korean war demand, and the end of the 'Bracero program' - see subsection 2.2.1 above - which accentuated the unemployment levels of the area during the early 1960s and set the conditions for the beginning of the 'Maquiladora program' which was intended to cope with the unemployment problems of the northern border area of Mexico, see Mendoza:1982) which seem to have affected mainly the reproductive behaviour of the three younger age groups, in which the response seem to have been that of delay of marriage, and the reduction in the proportions being married.

The second factor that can be associated with the sharp fertility decline that has been observed from 1972 onwards, is that of the major shift in the Mexican government official population policy which, through a legislative proposal submitted to the Congress in 1973, was aimed to change the "General Law of Population that had been passed in 1947...which specifically called for measures to promote marriage and fertility...and that was...reinforced by health regulations prohibiting the sale and use of contraceptives" (Alba & Potter:1986;61). From 1973 onwards, therefore, the national family planning program made contraceptive methods widely available, and that seems to be behind the sharp fertility decline that, again, seems to have had a more noticeable impact in the younger age groups of women (i.e. 20-34).

2.2.3.3.- Fertility levels.

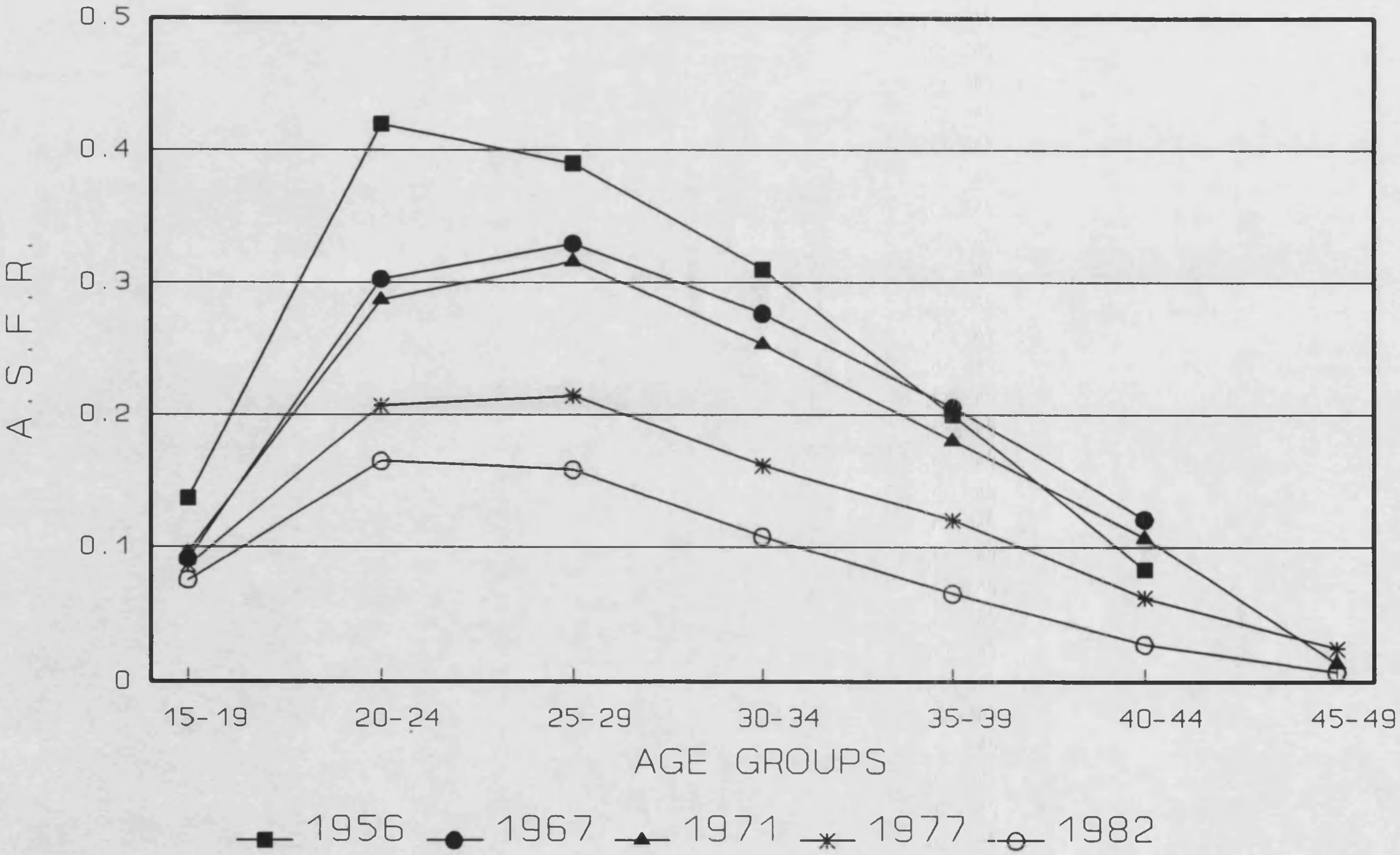
Taking into consideration that the information on fertility trends presented in the two previous subsections indicates a sharp fertility decline for the 10 to 15 years previous to the 1986 BCDS (from 6.2 TFR in 1970 to 3.0 TFR in 1982), in this subsection indirect demographic techniques are used in order to evaluate the quality of the fertility information gathered in the 1986 survey, and to generate an estimate of the fertility level and pattern prevailing at that point in time, which will provide us a reference point for the comparison of the reproductive behaviour of the native and inmigrant groups of the population of Baja California.

The data collected in the 1986 BCDS, provided information on both cumulated and current fertility. The former was gathered from two separate questions on the number of daughters and sons ever born to all women aged 12 and above. In the case of all women with at least one child ever born, a further question on the date of birth (year and month) of the last child was asked, and from this information the births that took place during the 12 previous months (i.e. November 1985 to October 1986) were used as the base for the measurements of current fertility (see, Annex 'B' for the original wording of these questions, which are those numbered 36.1, 37.1 and 38.1, respectively).

The first approach to the evaluation of fertility data from the 1986 BCDS is that of the application of the conventional P/F ratio technique. Resorting to a CELADE's program (CELADE:1988) we have computed the reported cumulative fertility and parity values ('P' & 'F') for Baja California data. From the values for 'P' - presented in Table 2.2.7 - Which monotonically increase with age, we can conclude that the cumulated fertility data do not seem to be affected by omission of live births, even at the oldest ages.

However, the values of estimated parity (column 2 in Table 2.2.7) from births in the last 12 months describe a

Fig.2.2.8.- B.C. ASFRs. for selected years.
V.R.S. Births (3 Year moving averages).



Source: Table 2.2.6.

current level of fertility of less than half of that implied in the cumulated fertility data (2.95 & 6.16, respectively). Therefore, the values of the P/F ratio presented in column 4 of Table 2.2.7 are all well above unity, increasing with age, and even taking a value of more than 2.0 in the case of the 45-49 age group.

TABLE 2.2.7
B.C.: P/F RATIO VALUES FROM CONVENTIONAL AND SINGLE YEAR COHORT TECHNIQUES, AND ASFRs FOR 1986.

AGE GROUP	P (1)	F fi+4 (2)	F fi (3)	P/F (1/2) (4)	P/F (1/3) (5)	5fx (6)
15-19	0.1332	0.1141	0.1017	1.167	1.309	0.0629
20-24	0.8788	0.6346	0.6462	1.385	1.360	0.1432
25-29	2.0038	1.4644	1.4247	1.368	1.407	0.1692
30-34	3.0629	2.2145	2.2247	1.383	1.377	0.1217
35-39	3.9536	2.6476	2.6476	1.493	1.493	0.0585
40-44	4.9929	2.8004	2.8314	1.783	1.763	0.0227
45-49	6.1583	2.9498	2.9272	2.088	2.104	0.0164

Source: Computed from, 1986 BCDS data.

Such range and trend in the P/F ratio values, far from being discouraging mainly tend to validate both the reported current level of fertility and the downward trend depicted by the VRS data previously analyzed, since it has been suggested that "..certain patterns of variation of the ratio with age may also reveal the types of problems present..(for the application of the fertility correction procedure)...For example, a recent decline in fertility tends to produce a sequence of P/F ratios that increases with age" (U.N.:1983; 35).

In order to ensure that the P/F ratios trend was not an artifact of the model age-specific fertility and the interpolation procedure implicit in the conventional P/F ratio technique, we have resorted to the procedure of single-years cohorts estimation of the 'F' values, as described by Hobcraft, et.al.,(1981), since it takes into account both the fertility and the age structure of the sample itself, and not that of a given model (Ibid:1981).

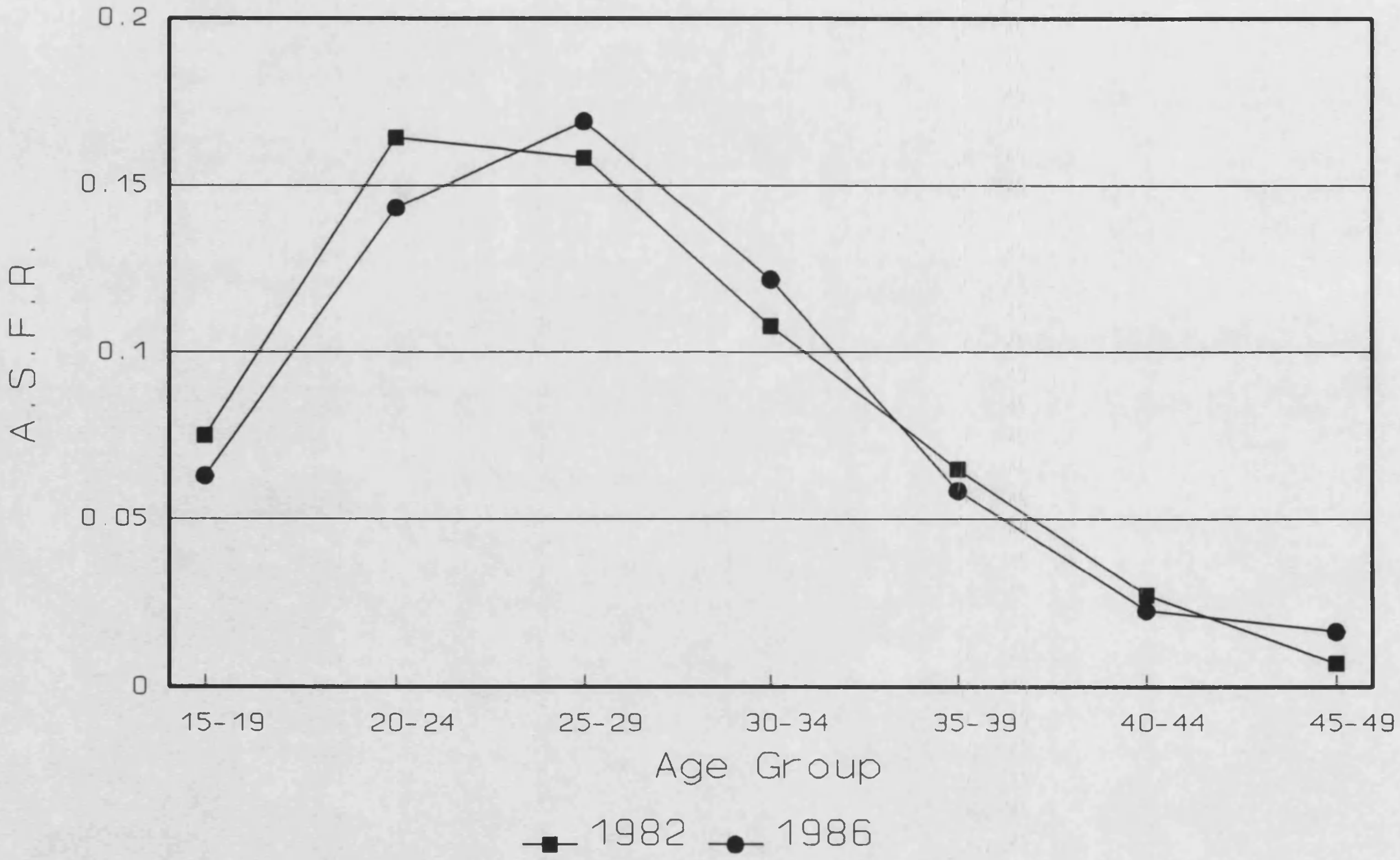
The 'F' values and the P/F ratios obtained from such procedure are presented in columns 3 and 5 of Table 2.2.7. When comparing the conventional 'F' values (column 2) with those computed from the single-years cohort approach (column 3), the two noticeable features are that the 'F' values are quite similar at every given age group - with proportional differences under 3.0% for all but the first age group - and that the cumulated parity estimates from the actual structure and level of current fertility is, on the whole, even lower than the one estimated by the conventional method (2.93 and 2.95, respectively).

As a consequence of the resulting 'F' values from the single-years cohort procedure, the corresponding P/F ratio values as a whole (column 5) show, again, an increasing value with age - for all but the 30 to 34 age-group - which confirms the presence of a declining trend in recent fertility.

On this basis we have decided that no correction was required for the reported current fertility level for 1986, and therefore the ASFRs for five-year age groups corrected for half year displacement are presented in column 6 of Table 2.2.7, and graphically displayed in Figure 2.2.9, which also includes the ASFRs for 1982 from the VRS data.

From the comparison of those two sets of data we are able to see that the TFR declined very modestly between 1982 and 1986, since the corresponding TFR values are 3.00 and 2.97, respectively. However, at the same time, the ASFRs for 1986 seem to suggest that the age pattern of fertility was then not only uni-modal but also 'older' than the one depicted in the 1982 data, mainly due to the higher ASFRs in 1986 for the 25-34 age groups, a pattern that may be reflecting the effects of increasing birth-interval lengths in those age groups (i.e. changes in the 'tempo' of fertility, resulting in the postponement of births until relatively 'older' ages).

Fig. 2.2.9.- B.C. Age Specific Fertility Rates 1982 & 1986.
V.R.S. & 1986 BCDS Data.



Source: Tables 2.2.6 & 2.2.7.

2.3.- B.C. Social and Economic Characteristics.

Once we have described the trends, patterns, and levels of the main demographic variables in Baja California, we would like to turn attention to the basic economic and social characteristics that have prevailed in the state during the period in which those demographic changes have been taking place.

2.3.1.- National context.

The six northern states of Mexico which share the common feature of being adjacent to the international border between the United States of America (USA) and Mexico (see, Figure 2.1.1 for the location of Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora, and Tamaulipas), have also shared during most of the 20th century the characteristic of being one of the two areas of the country (the other being the metropolitan area of Mexico City) that have experienced the most gains both from the economic growth and development, and from the improvements in living standards that the country underwent during most of the first eight decades of this century.

In this regard, a pioneering analysis undertaken by Appendini, Murayama & Dominguez, (1972) was set out to test the hypotheses that; i) "the states that participated in the economic development process which started at the end of the last century, are the same states which now enjoy a relatively higher level of development, while those states which did not get integrated to the economic dynamic of the Porfiriato (i.e. late 19th and early 20th century) are still economically and socially backward...and, ii) that, since the more advanced states have had a more accelerated development, the economic and social gap between advanced and backward states have increased during the period 1900-1960" (Our Translation (OT). Ibid;2).

The conclusion that the authors reached in that study, which was based on a principal components analysis of ten economic variables and eight social characteristics[11], were that "both in 1900 and in 1960 the Distrito Federal (i.e. Mexico City) and some northern states such as Coahuila, Baja California, Nuevo Leon, and Sonora, occupy the first five places (in terms of economic and social development). These states have sustained their development process at a faster pace than the rest of the country. The rest of the northern states (i.e. Chihuahua and Tamaulipas) have also sustained their level of development above the national mean...For all these areas, the economic progress has been translated, in turn, into an improvement of their general standards of living, and thus they have attracted migrants from the more backward areas" (O.T. Ibid;19-20).

Variants of these sets of economic and social characteristics that have been observed to place those six northern states as one of the areas at the forefront of Mexico's socio-economic development, have been further analyzed at the inter-regional level when the six states have been considered as constitutive elements of the 'northern Mexican border region'. A case in point is that of the study presented by Beegle, Goldsmith & Loomis, (1960), in which the authors described and compared the social and demographic characteristics of five southwestern states of the USA with those of the six Mexican northern states adjacent to the international border.

11.- The economic variables included were: Gross State Domestic Product (GSDP) per capita; labor force in the primary sector; share of the traditional crops in the total value of the agricultural production; productivity of the primary sector; share of the secondary sector in the GSDP; share of the labor force in the secondary sector; productivity in the secondary sector; share of 'high level' positions in the labor force; share of the tertiary sector in the GSDP, and; proportions of native and migrant population. The social variables included were: Proportion of urban population; non-manual activities as proportion of labor force; 'juvenile' mortality (10M5); proportion of mono-lingual population; population per medical doctor; proportion illiterate; proportion of school-age population registered at school, and; ratio of pupils to teacher at primary school.

The results related to the six Mexican states included in that study, which was based on data pertaining to the first half of this century, allow one to see clear indications that even within that relatively more developed area of Mexico, Baja California was achieving higher standards of living at a more rapid pace.

In this case it was demonstrated that, among other characteristics, the state of Baja California had: the lowest proportions of persons aged 25 and over without schooling; the highest percentage increase in population between 1940 and 1950; the highest proportion of its population living in urban areas; the lowest total dependency ratio values; the lowest proportion of persons aged 5 and over who were illiterate; the highest proportions of both males and females aged 12 and over who were 'economically active'; the second lowest proportion of labour force in agriculture, and the highest proportions in commerce and services; the lowest proportion of living quarters without water service; and, the lowest proportion of population habitually using something other than manufactured shoes, and of population not eating wheat bread (Beegle, Goldsmith & Loomis:1960).

Several more recent studies have updated the information and analysis of some of the economic and social characteristics mentioned above, and from those results there still emerges evidence to support the suggestion that Baja California had reached, at least in the early 1980s, relatively higher standards of living than those prevailing both at the northern-regional or national level.

From some of those more recent studies, finally, we would like to emphasize some of the findings related to those key economic and social variables for understanding the demographic processes of Baja California. In this regard it should be pointed out that by 1980, the state had: a Gross Domestic Product per capita (GDP) which was more than 20.0% higher than that of Mexico as a whole; a GDP in which less that 10.0% comes from the primary sector; a gross female economic participation rate of 20.2%; a lower than national average primary school class-size, 23.3 pupils (SSA:1986); a 93.4% literacy rate among its population aged 15 and over; 82.6% of its population living in urban areas (i.e. towns with 5,000 or more residents); a lower residents per house density, and 90.6% of dwellings with electricity (CONAPO:1987b).

2.3.2.- Demographic implications.

The foregoing description of the social end economic features that have characterized the population of Baja California during this century have had, as one could expect, important effects upon the trends, patterns, and levels of the demographic variables of the state both when considered by itself (See, Section 2.2), as well as when they are considered in relation to the rest of the Mexican states or to the country as a whole.

In the area of mortality, for instance, Morelos, (1973) found that for the period between 1950 and 1960 the pattern of relative mortality reductions suggested that, "the states with the highest standards of living and with the fastest relative income per capita growth (i.e Distrito Federal, Nuevo Leon, Baja California, Coahuila, and Sinaloa) have shown a noticeable reduction in their infant mortality rates" (O.T. Ibid;296), which was greater than that for the country as a whole.

Following this same line of research, but in this case in the area of fertility, Garcia y Garma, (1979) suggested that in order to overcome some of the implicit difficulties involved in previous studies which were seeking to explain the relationship between socio-economic development and fertility trends in Mexico, and differentials between states up to 1970[12], it would be pertinent to use both a

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12.- See: Hicks, (1974) and Seivers, (1975); and the following debate both in **Demography** Vol.13, No.1, 1976 (pp.149-155), and in **Population Studies** Vol.31, No.1, 1977 (pp.175-177).

Mexican-standardized version of the Coale's Indices of marriage (Im), general fertility (If), and marital fertility (Ig), and the analytical framework of the proximate determinants of fertility.

The results of that study, which found that only two out of the four intermediate variables included were significant when regressed upon the index of general fertility (significant variables were; singulate mean age at marriage (SMAM) and the proportion of women who were widowed, separated or divorced, for the age group 15-49. Non-significant variables; proportion of childless and never-in-union women at age-group 45-49, and proportion of married, within union, divorced, separated, or widowed women that remained childless at age-group 45-49), indicated that when the expected direction of the effects of the significant proximate determinants were graphically associated with the levels of standards of living of each state, and with their corresponding index of general fertility for 1960 and 1970, one could easily identify four groups of states within Mexico.

Within those groups, 'Group W' which included the Federal District and the states of Nuevo Leon, Baja California, Chihuahua, Sonora, Coahuila, Jalisco, and Baja California Sur, was described as that with "those states which are amongst the more 'developed' in relation to the rest of the country, and in all probability, (those where)....a high level of 'modernization' and better standards of living affect fertility in a negative way through the 'intermediate variables'. Since none of these states show very high levels of fertility (when compared to the rest of the country) it can be said that the 'modernization' process has been accompanied with an attitudinal change toward fertility, and that it has already started its decline" (O.T. Garcia y Garma:1979;78).

The declining trend of fertility which was identified for the states in 'Group W', it should be added, was, in the opinion of the author, either about to begin, non-existent, or even expected to run in the opposite direction in the 24 remaining states of Mexico (Garcia y Garma:1979).

This latter suggestion about the onset of fertility decline in most of states of Mexico, should be taken into consideration and kept in mind when dealing with the third demographic implication of the social and economic levels of development of Baja California, i.e. that of the mobility of the population to and from the state. In relation to these processes the available literature starts back in the late 1960s, and has mainly dealt with the quantification of net migration, particularly for the second half of this century.

From these studies which vary widely in relation to data sources and methods of estimation, however, there has been a common and interrelated set of findings in relation to the migration process for Baja California. Among other characteristics, it has been shown that the absolute magnitude of the inter-censal net migration (INM) for the state can be estimated to have been in the range between +148.6 and +156.7 thousands for the period 1950-1960, depending on the method used (Cabrera:1967); that between 1960 and 1970 the estimated volume of the INM ranged between +94.2 and +118.8 thousands, also depending on the method used (Ordorica:1976); that from 1970 to 1980 the number of residents of Baja California born in another state of Mexico increased from 184.0 to 346.5 thousands, and that in the latter date that number represented 29.4% of the total population of the state (SSA:1986); and, that during all those periods the INM volumes for Baja California have been of a higher magnitude for females than for males (Cabrera: 1967. Ordorica:1976. Tabah & Cosio:1970).

That latter fact, which is a feature that has been found in most of the urban-oriented migration flows of Mexico, has been further analyzed more recently by Espinosa, (1984). From the results of that study - which used both the definition of migrant as 'a woman who has lived at least six months in a place different to that of her birth place', and the 1976-77 Mexican Fertility Survey (MFS) regional classification in which Baja California was included in Region 1 (see, Figure 2.1.1) - the data presented in Table 2.3.1 indicates that Region 1 had the highest proportion of migrant women included in the MFS sample, and that it reached a level just above 80.0%. Furthermore, this information also allows one to see that the proportion of migrants in towns of less than 2,500 inhabitants of Region 1 is only second to that of Region 2, and that for larger size of place of residence categories the highest proportion of migrants is also found in Region 1.

TABLE 2.3.1
PERCENTAGE OF MIGRANT WOMEN INCLUDED IN THE 1976-1977 M.F.S. BY REGION AND SIZE OF PLACE OF RESIDENCE (thousands).

REGION	TOTAL (n)	% OF TOTAL MIGRANTS	% OF TOTAL NON-MIGRANT	SIZE OF PLACE OF RESIDENCE MIGRANTS PROPORTIONS < 2.5	2.5-19.9	20.0+	METROPN. AREAS
TOTAL	7308	66.1	33.9	60.4	62.0	73.6	69.2
1..NW	613	80.9	19.1	73.9	77.6	88.7	-
2..NE	535	73.5	26.5	76.6	N.A.	72.2	71.7
3..N	865	72.4	27.6	71.0	75.6	72.5	-
4..W	1122	62.3	37.7	52.7	59.5	62.5	79.6
5..C	2904	61.7	38.3	52.1	53.7	64.9	67.2
6..E	443	53.7	46.3	47.0	20.0	79.7	-
7..SE	155	72.3	27.7	N.A.	N.A.	68.7	-
8..SW	671	70.6	29.4	71.4	59.3	78.0	-

Source: Espinosa, G:1984;330-331.

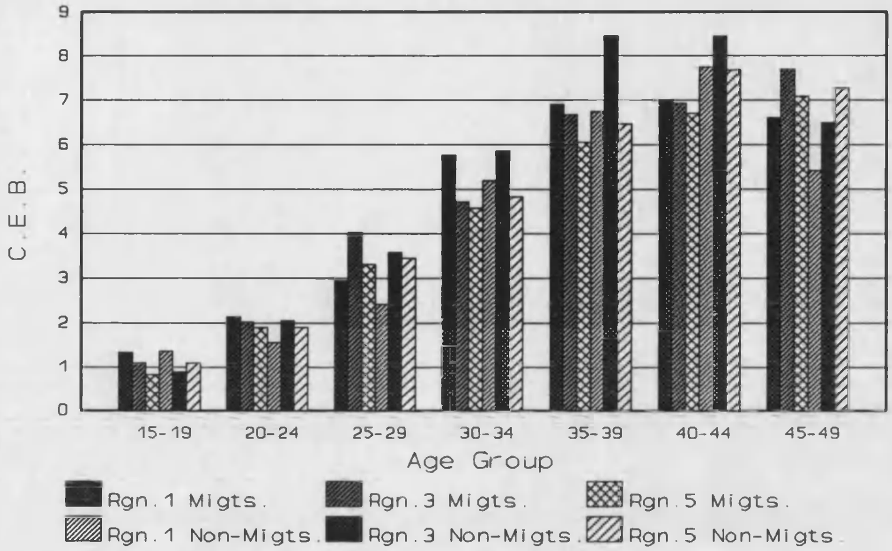
Turning now to the information included in Table 2.3.2 and depicted in Figure 2.3.1, we would like to underline the fact that contrary to the pattern observed in all remaining Regions - but especially in Regions 4 to 8 - one can see that in Region 1 migrant women had higher cumulated fertility than that of non-migrants at all but the 15 to 19 and 40 to 44 age-groups.

TABLE 2.3.2
AVERAGE NUMBER OF C.E.B. TO WOMEN CURRENTLY IN UNION BY REGION OF RESIDENCE, AGE GROUP AND MIGRATORY STATUS. (1976-77 MFS)

AGE GROUP	TOTAL	REGION							
		I (NW)	II (NE)	III (N)	IV (W)	V (C)	VI (E)	VII (SE)	VIII (SW)
15-19									
MIGRANTS	1.04	1.33	1.06	1.10	0.87	0.83	0.73	1.50	1.35
NON-MGTS.	1.02	1.36	0.67	0.88	1.23	1.10	0.75	0.67	1.00
20-24									
MIGRANTS	2.04	2.14	2.09	2.02	2.13	1.89	2.02	2.56	2.23
NON-MGTS.	1.93	1.56	2.46	2.05	1.86	1.90	2.00	1.50	2.07
25-29									
MIGRANTS	3.46	2.94	3.17	4.03	3.68	3.30	3.27	3.54	3.81
NON-MGTS.	3.50	2.42	1.92	3.57	3.98	3.45	4.05	3.63	3.31
30-34									
MIGRANTS	4.98	5.76	5.16	4.71	5.59	4.57	4.65	3.64	5.31
NON-MGTS.	5.37	5.20	5.11	5.86	6.53	4.83	5.73	4.80	5.81
35-39									
MIGRANTS	6.44	6.91	6.07	6.68	6.85	6.05	6.21	5.33	6.93
NON-MGTS.	6.83	6.75	5.33	8.46	8.28	6.46	6.35	7.33	6.94
40-44									
MIGRANTS	7.00	6.98	5.98	6.93	8.32	6.71	5.75	7.67	7.64
NON-MGTS.	7.96	7.75	9.33	8.46	9.16	7.68	6.25	8.50	7.94
45-49									
MIGRANTS	7.19	6.61	6.43	7.69	7.86	7.09	6.18	6.29	7.69
NON-MGTS.	7.73	5.43	9.50	6.50	8.64	7.27	9.20	N.A.	7.60

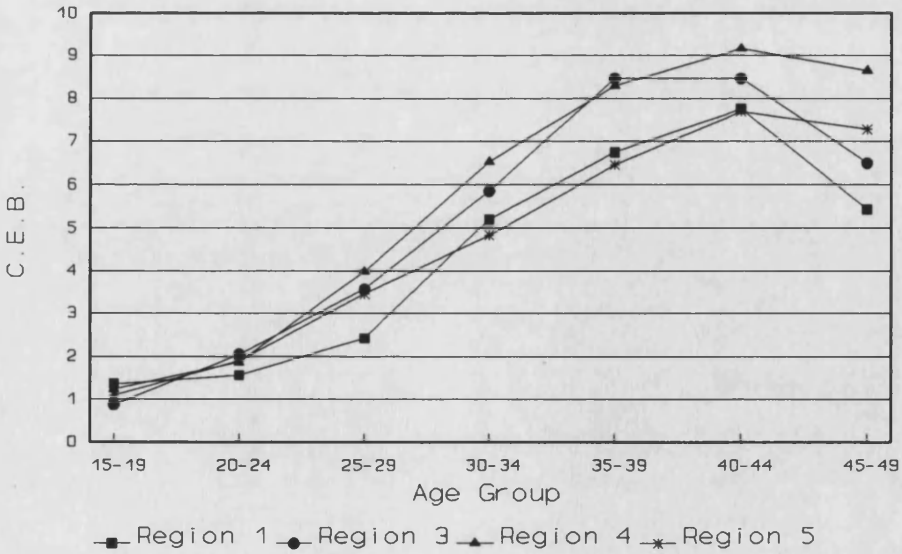
Source: Espinosa, G.:1984;330-331.

Fig. 2.3.1.- Children Ever Born to women currently in union by Region of Residence and Migratory Status (1976-77 MFS data).



Source: Table 2.3.2.

Fig. 2.3.2.- Children Ever Born to Non-Migrant women currently in union by Region of Residence (1976-77 MFS data).



Source: Table 2.3.2.

A second and final point to note about this data is that with the exception of the 15 to 19 age-group, the non-migrant women of Region 1 had some of the lowest cumulated fertility values in all the remaining age-groups, as the comparison with Regions 3,4, & 5 indicates in Figure 2.3.2.

Those contrasting patterns of reproduction depicted by the migrant and non-migrant groups (particularly for those in Region 1) are the central focus of our analysis for the case of Baja California, and we will be presenting that analysis in the following chapters. Meanwhile, however, we would like to end this section by emphasizing both, the wide range of areas of origin of the inmigrant residents of the state, and the relentless nature of the movement of population towards Baja California.

For that purpose, we have resorted to the main set of data that we will be analyzing, which is that of the 1986 Baja Califonia's Demographic Survey (BCDS). The survey was based on a probability self-weighted multi-stage household sample, selected from four independent Municipal sampling frames which were purpose-built for the implementation of the BCDS(13).

With that set of data we have computed the absolute and proportional figures presented in Tables 2.3.3 & 2.3.4, which allow one to observe the distribution by Region of origin and the length of residence in Baja California for the migrant women of reproductive ages included in the 1986 BCDS. At this point we must make a note of the fact that in this study non-migrants or natives have been defined as those who were born in Baja California and have never changed their place (i.e. town) of residence. Therefore the migrant group also includes all of those women who were born in the state but that have moved either within the state or between states

13.- For a full description of the methodological and technical characteristics of the 1986 BCDS, see; CONEPO-BC, CRIM-UNAM, & IIS-UABC (1987).

at any given period of time.

From the information of the last table we would like to emphasize two points. The first is one related to the distribution of length of residence of the migrants, which in our view seems to substantiate the previous assertion (See, Section 2.2.1) in relation to the ongoing process of inmigration into Baja California, not only for the 1970 to 1980 period but also for the years located after 1980.

The second point to note is the relatively high concentration of the origin of the migrants in four of the eight Regions depicted in Figure 2.1.1. In terms of those four Regions the information in Table 2.3.4 seems to suggest that the 'catchment-area' of the state has been reducing over time, since the proportions of migrants from Region 1 have tended to increase during the last 25 years. At the same time, however, one should also note that even in the very recent periods more than a third of the migrants came to the state from regions as far away as the centre and west of the country, and that this pattern seems to have held at least for the 15 years previous to the 1986 BCDS.

Having stated our objectives, hypothesis, main concepts, methodological approach, and described the socio-economic and demographic context in which we will be studying the fertility-migration relationship, in the following chapter we address the issues of the current (as at the 1986 BCDS) reproductive behaviour of the native and migrant groups of Baja California, and that of the socio-economic or 'remote' factors which are expected to influence, in turn, the patterns of reproductive behaviour of those groups of the population of the state.

Table 2.3.3
BAJA CALIFORNIA: MIGRANT FEMALE POPULATION OF REPRODUCTIVE AGES BY BIRTH REGION IN MEXICO AND TIME OF RESIDENCE IN BAJA CALIFORNIA (1986).

REGION OF BIRTH IN MEXICO	TOTAL	RESIDENT SINCE					
		86-85	84-81	80-71	70-61	1960 & BEFORE	N.S.
TOTAL.......	3103	313	464	1053	826	337	110
REGION							
1-NORTHWEST.	1180	136	196	393	277	139	39
2-NORTHEAST.	32	2	3	12	11	3	1
3-NORTH.....	454	32	60	164	143	45	10
4-WEST......	858	67	106	275	278	103	29
5-CENTRE....	396	44	61	159	88	34	10
6-EAST......	28	10	5	4	6	3	0
7-SOUTHEAST.	4	1	0	1	0	0	2
8-SOUTHWEST.	78	9	20	31	13	4	1
U.S.A.......	37	9	10	6	6	4	2
OTHER CONTS. & N.S......	36	3	3	8	4	2	16

Source: CONEPO-BC, CRIM-UNAM, ISS-UABC (1987).

Table 2.3.4
BAJA CALIFORNIA: PERCENTAGE OF MIGRANT FEMALE POPULATION OF REPRODUCTIVE AGES BY BIRTH REGION IN MEXICO AND TIME OF RESIDENCE IN BAJA CALIFORNIA (1986).

REGION OF BIRTH IN MEXICO	TOTAL	RESIDENT SINCE (Column percentage)					
		86-85	84-81	80-71	70-61	60 & BEFR.	N.S.
Row = 100.0%		10.1	15.0	33.9	26.6	10.9	3.5
REGION							
1-NORTHWEST.	38.0	43.5	42.2	37.3	33.5	41.2	35.5
2-NORTHEAST.	1.0	0.6	0.7	1.1	1.3	0.9	0.9
3-NORTH.....	14.6	10.2	12.9	15.6	17.3	13.3	9.1
4-WEST......	27.7	21.4	22.8	26.1	33.7	30.6	26.4
5-CENTRE....	12.8	14.0	13.1	15.1	10.7	10.1	9.1
6-EAST......	0.9	3.2	1.1	0.4	0.7	0.9	0.0
7-SOUTHEAST.	0.1	0.3	0.0	0.1	0.0	0.0	1.8
8-SOUTHWEST.	2.5	2.9	4.3	2.9	1.6	1.2	0.9
U.S.A.......	1.2	2.9	2.2	0.6	0.7	1.2	1.8
OTHER COUTS. & N.S......	1.2	1.0	0.7	0.8	0.5	0.6	14.5
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: CONEPO-BC, CRIM-UNAM, ISS-UABC (1987).

III.- PROXIMATE DETERMINANTS.

Having described the social and economic context in which the relation between migration and fertility has been developing in Baja California (Chapter II), in this chapter we will be addressing two central issues regarding that relationship.

The first one is that of the analysis of the current (as at the 1986 BCDS) reproductive behaviour of the native and inmigrant groups of the population of the state, by means of the application of the 'intermediate fertility variables' approach (Davis & Blake:1956)in its version of the Bongaarts' 'proximate determinants' model. From that analysis, which is presented in Section 3.1, we shall identify not only the main differences between the fertility patterns of those two groups, but also the underlying demographic mechanisms that explain those different patterns of reproductive behaviour.

Once we have analyzed the magnitude of the effects of the proximate determinants upon the fertility of the native and inmigrant populations, their ranking, and the composition of the differences between the fertility rates of those groups, we will turn attention (Section 3.2) to the analysis of the 'remote' or socio-economic factors which, in turn, are expected to affect the patterns of reproductive behaviour which are accounted for by the proximate determinants of fertility (i.e. the patterns of marriage, contraception, and post-partum infecundability).

3.1- Native and Inmigrant Fertility.

3.1.1- Components of the model and their measurement.

As has been noted in Section 1.2.3, one of the debated issues in relation to the application of the

Bongaarts' proximate determinants model is that of the selection and actual measurement of its components. In the case of the selection of the components to be included in the model, given the fact that it has been suggested that most of the fertility level variation among populations is mainly due to marriage, contraception, postpartum infecundability, and abortion (Bongaarts:1982), and that the 1986 BCDS like most surveys only provides information on the three first components, we will concentrate our analysis on those three factors.

The exclusion of abortion from our implementation of the Bongaarts' model, furthermore, is based on the facts that in Mexico "abortion is illegal except to save the woman's life or in cases of rape and incest" (U.N.:1989;176), and that although abortion was included as an option within the answers to the question related to use of methods of contraception (see; Annex 'B', question 3.9.2) in the 1986 BCDS, not a single woman reported having used it. In this case, therefore, resorting to official statistics - if available for the period under consideration - would generate a distorted perception of the fertility reducing effect that abortion may play in these groups of the population of Baja California, since they are based on the experience of women who have had to use abortion as a last recourse measure and under official sanction.

For the measurement of the three selected components, Casterline, et.al., (1984) have posited a set of options to be considered when computing the values of these components. For the Index of Marriage (Cm), which is defined as: Cm = TFR / TMFR

where;

TFR = Total Fertility Rate,

TMFR = Total Marital Fertility Rate,

the first option is that of constructing TFR either from Age Specific Fertility Rates (ASFRs) based on the total number of births in the last 12 months, or from ASFRs based only on legitimate births in the last 12 months.

Since the original formulation of the model calls for the TFR to be constructed from within-union births only (Bongaarts & Potter:1983), and since they are available in our data set, we have decided to compute TFR from ASFRs based on births in the last 12 months only to women who were either married or in consensual unions at the time of the survey (i.e. we are computing the Total Legitimate Fertility Rate).

A second option that the Cm computation procedure allows is that suggested by Bongaarts, (1982) in relation to the ASMFR of the age group 15-19, which tends to show erratic values because small errors in the proportions married produce large errors in the ASMFR values, because pre-marital conceptions tend to select the more fecund women, and married women are concentrated in the older ages within the age group (18-19). Therefore, for the purpose of computing TMFR we follow Bongaarts recommendation that the ASMFR(15-19) be corrected as 0.75 * ASMFR(20-24).

In the construction of the Index of Contraception (Cc), which is defined as:

$$Cc = 1 - (1.08 * u * e)$$

where;

1.08 = Sterility correction factor,
u = Prevalence of current contraceptive use,
e = Average use-effectiveness of contraception,

Casterline, et.al., (1984) identify three options to be considered:

i) Age-specific versus non age-specific construction of (u);

ii) Correction of (u) for the overlap between contraceptive use and lactation, and;

iii) Alternative schedules of age-specific proportions fecund, implicit in the weighted mean 1.08.

The first of the three options mentioned above, implies that one could resort either to the overall proportion on Non-Pregnant Married Women of Reproductive Ages (NP-MWRA) using contraception as the value of (u), or to a mean of the age-specific proportions of NP-MWRA using contraception.

Since it has been noted (Casterline, et.al.:1984) that the variations in the age-structures and age patterns of contraceptive use - especially among socio-economic groups - could have implications for the purpose of comparative analysis, we have chosen to compute (u) as the sum of the weighted age-specific proportions of NP-MWRA using contraception (with the age structure of the NP-MWRA as weights), given that in our view this procedure will render estimates of (u) that better resemble the actual population contracepting - due to the fact that one is taking into account the age-distribution of the population - than those estimates that can be obtained when resorting to a non-weighted mean of age-specific proportions of users.

In the case of the correction for the overlap between contraception and lactation, it has been suggested (Casterline, et.al.:1984) that for certain lengths of time during breast-feeding (at least six months according to WFS data) the majority of women will still be amenorrhoeic, and hence should not be counted as users of contraception.

In this regard it should be noticed that a sensitivity analysis carried out by Casterline, et.al.(1984) indicated that this correction yields minimal differences on Cc (about 1.0%) and that the authors argue that in light of the results it seems reasonable to suggest that "in most national populations the potential distortion caused by overlap is small" (Casterline, et.al.:1984;12). Furthermore, given that the proportion of current breast-feeding women in our sample is 1.5% (25/1677) of the total number of NP-MWRA using contraception, we can reasonably assume that no major distortion would be caused in the computation of (u), and therefore no correction for overlap would be made.

The third option in the construction of Cc is that of the use of alternative schedules of age-specific proportions fecund; that is, choosing between behavioral or self-reported fecundity schedules. Under the assumption that both the self-reported age-specific proportions fecund, and the age-specific proportions of contraceptive use are usually biased upwards, and that use status among those who think they are fecund is random with respect to actual fecundity, we have decided to follow Bongaarts' (1982) formulation for the construction of Cc, which implicitly involves the self-reported age-specific fecundity status schedule in the 1.08 sterility correction factor.

The last component of the model to be incorporated is the Index of Postpartum Infecundability (Ci), which has been defined as:

$Ci = 20 / (18.5 + i)$ where;

20 = Average (in months) live birth interval in the absence of any lactation amenorrhoea and postpartum abstinence,

18.5 = Average (in months) live birth interval minus the infecund interval in the absence of lactation,

i = Average duration of infecundability from birth to the first postpartum ovulation.

When no direct estimate of (i) is available, it has been posited that a good approximation can be obtained from the average duration of breast-feeding (B), with the following equation (Bongaarts:1982);

$i = 1.753 \ Exp[(0.1396 * B) - (0.001872 * B^2)]$.

In this case, Casterline, et.al. have identified as an option the construction of the index either in an age-specific or in a non-age-specific version. The sensitivity analysis carried by the authors led them to conclude that there is "virtually no difference between the two Ci indices... except in those countries where... postpartum abstinence introduces a more serious bias" (Casterline, et.al.:1984;13-14).

Since the latter is not the case for the area of Mexico in which we are interested - due to the facts that in Baja California more than 80.0% of the population lives in urban areas, and that the more recent available information for Mexico indicates that in the areas of 20,000 or more inhabitants the mean length of post-partum sexual abstinence is 3.8 months (SSA & DHS:1989;30) - our application of the model adheres to the non-age-specific version for the construction of the index of postpartum infecundability.

In summary, our options for the construction of the indices of marriage, contraception, and postpartum infecundability are; to compute TFR from within union births only; to correct the ASMFR(15-19) as 0.75 * ASMFR(20-24); to compute (u) as the weighted age-specific proportions of NP-MWRA using contraception (using the NP-MWRA age proportions as weights); not to correct Cc for the overlap between contraception and breast-feeding; to rely on the self-reported fecundity status schedule, and; to construct Ci in a non-age-specific version. It is our contention, therefore, that our estimates of the proximate determinants of fertility resemble more closely those proposed by Bongaarts, than those estimated from other versions of the model.

3.1.2.- Application of the model.

Based on the information provided in Tables 3.1.2 to 3.1.6, Table 3.1.1 contains the computed values for the indices of marriage, contraception, and postpartum infecundability, as well as the estimated levels of Total Fecundity (TF), Total Natural Marital Fertility (TN), and Total Marital Fertility (TM) for the total, native, and inmigrant populations of Baja California.

A first point to note about the data presented in Table 3.1.1, is that of the low values that the observed Total Legitimate Fertility Rates (TLFR) for the populations considered in the analysis, which for both groups is under 3.0

births per woman. According to two different criteria for the categorization of Fertility Transition stage, these low values correspond either to Phase IV when all or most of the fertility transition has been completed (Bongaarts:1982), or to the group of WFS countries that have been classified as those with an 'early' fertility decline - Costa Rica, Panama, and Trinidad and Tobago, in the Americas (Casterline, et.al.: 1984).

An additional observation that should be mentioned in relation to the values of the TLFRs, is that they are around 0.30 of a child lower than the conventional Total Fertility Rates (TFRs) for the three groups (i.e. since TFRs computed from all births are 2.97, 2.75, and 3.26 for the total, native, and inmigrant populations, respectively) and, also, they represent rather different patterns of extra-union fertility for the native and inmigrant sub-groups, with the former showing higher proportions of illegitimacy, because of their lower overall level of fertility.

TABLE 3.1.1
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY.
1986 BCDS DATA; TOTAL, NATIVE & INMIGRANT POPULATION.

INDEX	TOTAL	NATIVES	INMIGRANTS
Cm	0.5942	0.5499	0.6382
Cc	0.3858	0.3427	0.4027
Ci	0.9123	0.9339	0.9034
TF	12.77	13.81	12.66
TN	11.65	12.89	11.44
TM	4.49	4.42	4.61
TLFR	2.67	2.43	2.94

Source: Tables 3.1.2 to 3.1.6.

In this case, such differentiated patterns turn out to be a point in favour for the use of the Total Legitimate

Fertility Rate instead of the conventional TFR, since the former allows for the exclusion of this intervening element from the comparison between groups based upon the model.

Turning now to the Index of Marriage (Cm) note the low value of this index for the native population, which is 16.1% lower than that of inmigrants. The pattern of marriage represented by the levels of these indices corresponds to Phase IV in the Bongaarts' 'synthetic' fertility transition classification in the case of the native group, and to Phase II or the 'recent' fertility decline for the inmigrant population according to the Bongaarts' and Casterline et.al.'s groupings, respectively.

A first indication of which are the elements on the basis of this differential loss of exposure that the index of marriage indicates between the two groups, can be obtained from the information presented in Panels B & C of Table 3.1.2, and are depicted in Figure 3.1.1. These figures show that in all but the two oldest age-groups, the native population has lower proportions of women within union. A further element that should be taken into consideration is that when the Female Singulate Mean Age at Marriage[14] (FSMAM) has been computed for the native and inmigrant groups, the respective values are 24.3 and 21.6 years.

Taken together, those two elements seem to suggest that at least in the case of the native population, its low value on the Cm mainly comes about as the result of relatively late ages at marriage and permanent celibacy, and that the potential contribution of union dissolution (divorce, separation, and widowhood) and/or spousal separation to loss

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14.- FSMAM computed (see; Hajnal:1953) as:

$$FSMAM = 15 + \{((n * SUM\ {}_{n}S_{i})-(35*S_{50}))\ /\ 1- S_{50}\}$$

where; ${}_{n}S_{i}$ = proportions single by age group,

$$S_{50} = (S_{45\text{-}49} + S_{50\text{-}54})\ /\ 2.$$

of exposure might be relatively weak.

The next factor to consider is the Index of Contraception (Cc), which for both the native and inmigrant populations presents very low values, especially for the former group. In terms of the fertility transition classifications mentioned above, both groups can be considered among either the 'early' decline category or in-between Phases III and IV of the 'synthetic' transition scheme. At the same time, however, it should be noticed that the low Cc values of the two groups are achieved by rather different paths.

For instance, as could be seen in the information presented in Tables 3.1.3 to 3.1.5, the use-effectiveness component of Cc is virtually the same for both populations (i.e. just under 0.90 which, by the way, corresponds to 'advanced' stages of the fertility transition groupings), but the 'mixture' of contraceptive methods by proportions of users is somewhat different; among the native group the decreasing order of the preferred methods is headed by the pill, female sterilization, and intra uterine devices, with the first having almost double the proportion of the second; on the other hand, for the inmigrant population, female sterilization, pills, and IUDs is the decreasing order of method preference, with a substantial 35.0% of users using the first method, compared with only 23.6% of the natives.

A further point of departure between the two groups in the composition of Cc, is that of the age pattern and level of contraception prevalence (top-section of Tables 3.1.4 & 3.1.5, and Figure 3.1.2). In this case, it can be seen that the age-pattern of the native users either matches or out-scores the five age-groups in the range 15-39, and that with or without age-structure weighting the proportions of NP-MWRA contracepting is higher for the native population. This latter fact, therefore, accounts for most of the difference between the values of Cc for the native and inmigrant groups.

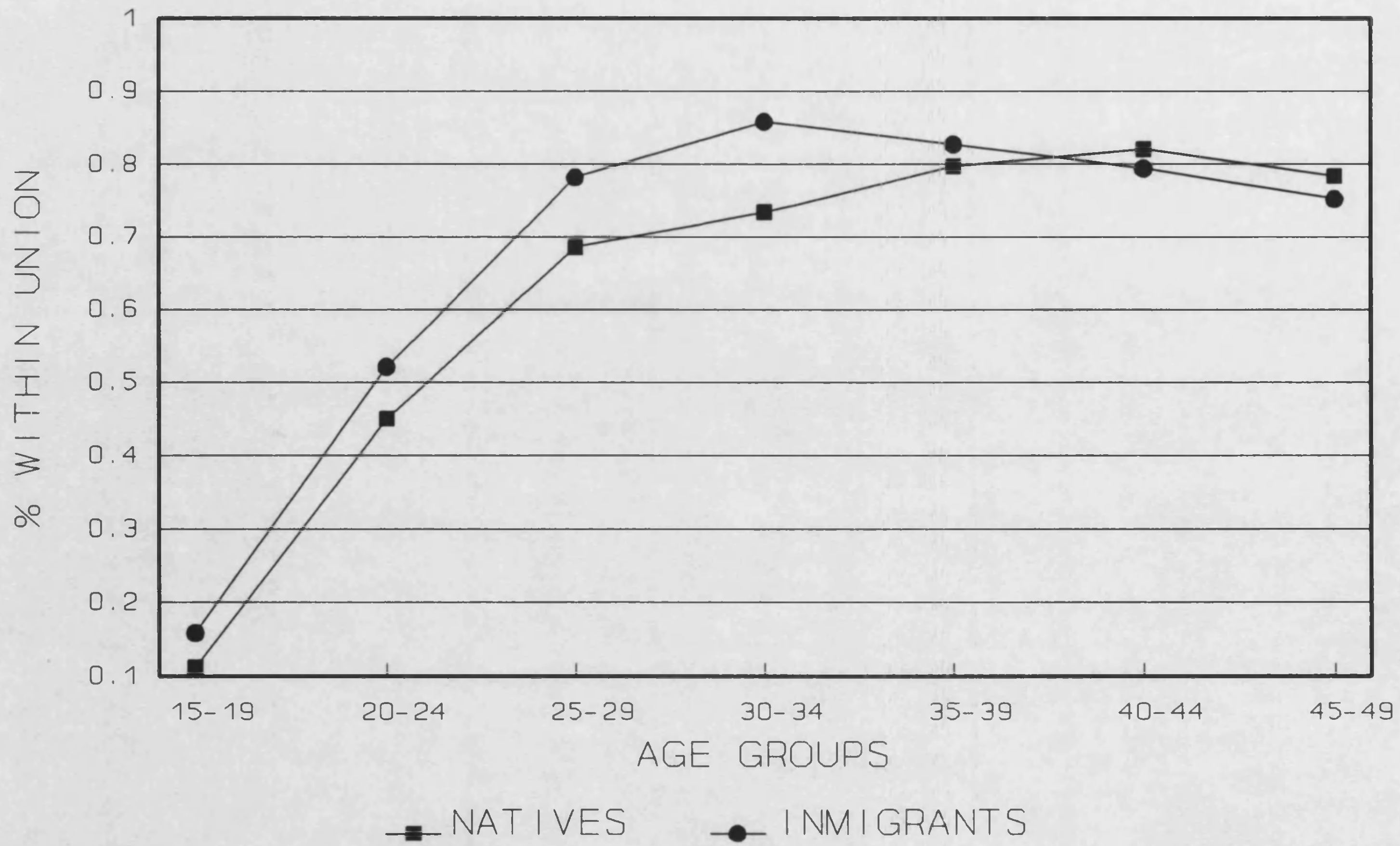
TABLE 3.1.2
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY.
INDEX OF MARRIAGE, 1986 BCDS DATA.

AGE GROUP	(1) WOMEN TOTAL	(2) WITHIN UNION	(3) W/UNION BIRTHS	% W/UNION m(a) (2/1)	ASLFR f(a) (3/1)	g(a) (fa/ma)
A.- TOTAL POPULATION. Cm = INDEX OF MARRIAGE = TLFR/TM = 0.5942						
15-19	1164	152	52	0.1306	0.0447	0.1820
20-24	1040	507	123	0.4875	0.1183	0.2426
25-29	785	584	119	0.7439	0.1516	0.2038
30-34	668	549	78	0.8219	0.1168	0.1421
35-39	539	442	32	0.8200	0.0594	0.0724
40-44	423	337	10	0.7967	0.0236	0.0297
45-49	360	272	7	0.7556	0.0194	0.0257
					TLFR	TM
	4979	2843	421		2.669	4.491
B.- NATIVE POPULATION. Cm = INDEX OF MARRIAGE = TLFR/TM = 0.5499						
15-19	684	76	23	0.1111	0.0336	0.1797
20-24	483	217	52	0.4493	0.1077	0.2396
25-29	305	209	38	0.6852	0.1246	0.1818
30-34	195	143	13	0.7333	0.0667	0.0909
35-39	113	90	8	0.7965	0.0708	0.0889
40-44	50	41	2	0.8200	0.0400	0.0488
45-49	46	36	2	0.7826	0.0435	0.0556
					TLFR	TM
	1876	812	138		2.434	4.427
C.- INMIGRANT POPULATION. Cm = INDEX OF MARRIAGE = TLFR/TM = 0.6382						
15-19	480	76	29	0.1583	0.0604	0.1836
20-24	557	290	71	0.5206	0.1275	0.2448
25-29	480	375	81	0.7813	0.1688	0.2160
30-34	473	406	65	0.8584	0.1374	0.1601
35-39	426	352	24	0.8263	0.0563	0.0682
40-44	373	296	8	0.7936	0.0214	0.0270
45-49	314	236	5	0.7516	0.0159	0.0212
					TLFR	TM
	3103	2031	283		2.939	4.605

Note.- g(a) for the 15-19 group is computed as; (0.75 * g20-24).

Fig.3.1.1.- B.C. A.S. % OF WOMEN IN UNION.

1986 BCDS DATA.



Source: Panels 'B' and 'C' in Table 3.1.2.

TABLE 3.1.3
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY.
INDEX OF CONTRACEPTION; 1986 BCDS DATA, TOTAL POPULATION.

AGE GROUP	% MWRA NONPREGNANT USERS (1)	MWRA-NP AGE STRUCTURE (2)	WEIGHTED % MWRA-NP USERS ((1*2)/100)
15-19	50.4	4.9	2.5
20-24	68.5	16.7	11.4
25-29	73.8	20.2	14.9
30-34	73.2	19.5	14.3
35-39	68.4	16.0	10.9
40-44	53.6	12.5	6.7
45-49	27.8	10.2	2.8
Reported Avg.	59.39	100	% USERS= 63.57

Cc =INDEX OF CONTRACEPTION = 1- (1.08* e * u) = 0.3858

(u) = % PREVALENCE = 63.57 (e)= 0.8946

METHOD	Distbtn. % OF USERS (1)	USE-EFFEC TIVENESS STANDARD (2)	e(i) (u*(1)*(2))
STERILIZA.	31.5	1.00	0.20025
VASECTOMY	1.1	1.00	0.00699
PILL	40.1	0.90	0.22943
INYECTION	7.9	0.70	0.03515
IUD	11.4	0.95	0.06885
FOAM/JELLY	0.7	0.70	0.00311
CONDOM	2.1	0.70	0.00934
DIAPHRAGM	0.3	0.70	0.00133
RHYTHM	2.4	0.70	0.01068
WHITDRAW	0.5	0.70	0.00222
OTHERS	0.3	0.70	0.00133
N.S.	1.6	0.00	0.00000
TOTAL	100	(e)= SUMe(i)/(u) =	0.8946

TABLE 3.1.4
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY.
INDEX OF CONTRACEPTION; 1986 BCDS DATA, NATIVE POPULATION.

AGE GROUP	% MWRA NONPREGNANT USERS (1)	MWRA-NP AGE STRUCTURE (2)	WEIGHTED % MWRA-NP USERS ((1*2)/100)
15-19	50.7	8.9	4.5
20-24	68.2	26.3	17.9
25-29	77.2	25.7	19.8
30-34	75.8	17.6	13.3
35-39	78.2	11.5	9.0
40-44	46.2	5.2	2.4
45-49	25.0	4.8	1.2
Reported Avg.	60.19	100	% USERS= 68.23

Cc =INDEX OF CONTRACEPTION = 1- (1.08* e * u) = 0.3427

(u) = % PREVALENCE = 68.23 (e)= 0.8921

METHOD	Distbtn. % OF USERS (1)	USE-EFFEC TIVENESS STANDARD (2)	e(i) (u*(1)*(2))
STERILIZA.	23.6	1.00	0.16101
VASECTOMY	0.8	1.00	0.00546
PILL	46.6	0.90	0.28614
INJECTION	9.6	0.70	0.04585
IUD	14.2	0.95	0.09204
FOAM/JELLY	0.4	0.70	0.00191
CONDOM	1.2	0.70	0.00573
DIAPHRAGM	0.2	0.70	0.00096
RHYTHM	1.6	0.70	0.00764
WHITDRAW	0.2	0.70	0.00096
OTHERS	0.2	0.70	0.00096
N.S.	1.6	0.00	0.00000
TOTAL	100	(e)= SUMe(i)/(u) =	0.8921

TABLE 3.1.5
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY. INDEX OF CONTRACEPTION; 1986 BCDS DATA, INMIGRANT POPULATION.

AGE GROUP	% MWRA NONPREGNANT USERS (1)	MWRA-NP AGE STRUCTURE (2)	WEIGHTED % MWRA-NP USERS ((1*2)/100)
15-19	50.0	3.3	1.7
20-24	68.7	12.9	8.9
25-29	71.8	18.1	13.0
30-34	72.3	20.2	14.6
35-39	65.9	17.7	11.7
40-44	54.6	15.4	8.4
45-49	28.2	12.4	3.5
Reported Avg.	58.79	100	% USERS= 61.68

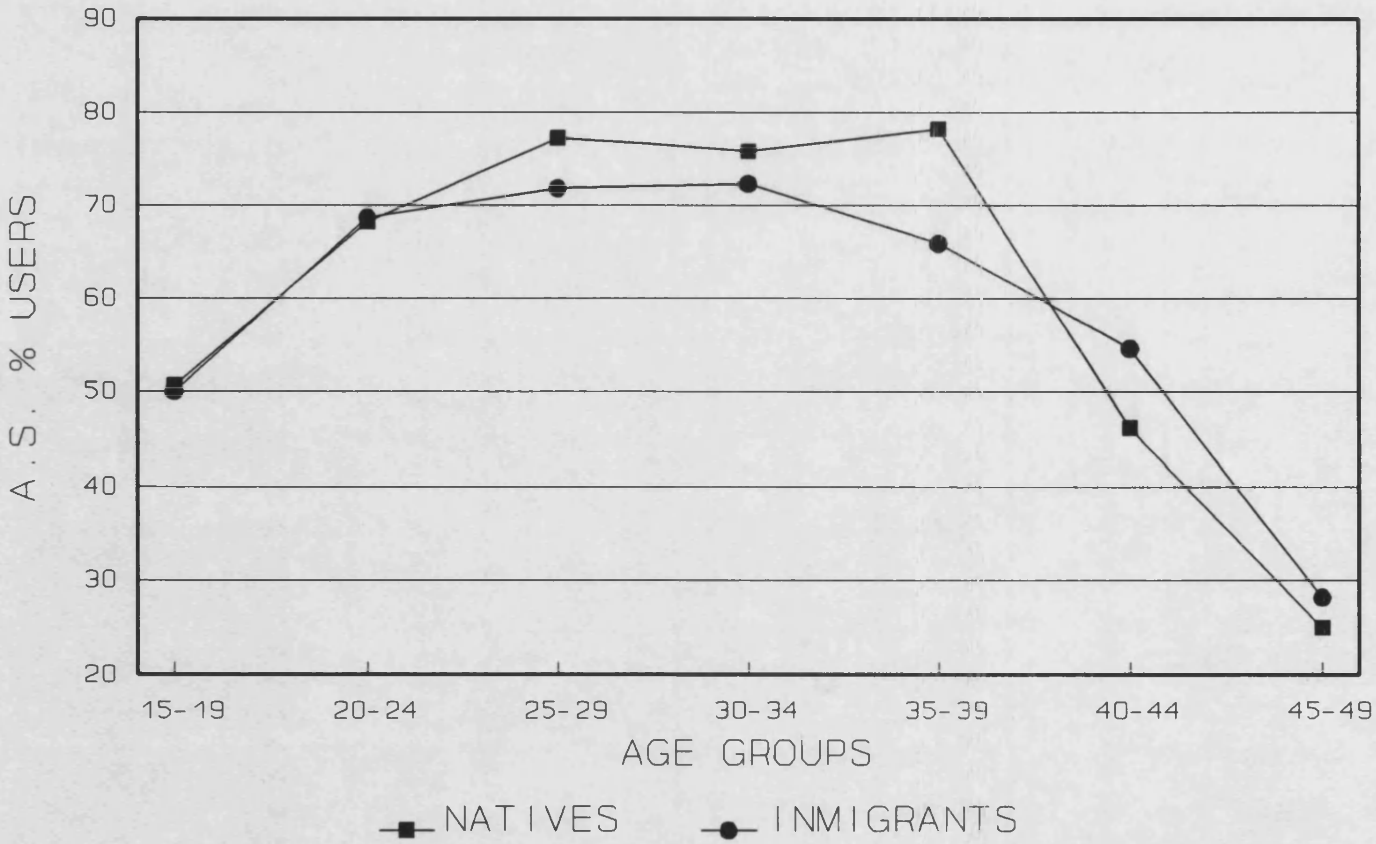
Cc =INDEX OF CONTRACEPTION = 1- (1.08* e * u) = 0.4027

(u) = % PREVALENCE = 61.68 (e)= 0.8966

METHOD	Distbtn. % OF USERS (1)	USE-EFFEC TIVENESS STANDARD (2)	e(i) (u*(1)*(2))
STERILIZA.	35.0	1.00	0.21589
VASECTOMY	1.2	1.00	0.00740
PILL	37.2	0.90	0.20651
INJECTION	7.1	0.70	0.03066
IUD	10.2	0.95	0.05977
FOAM/JELLY	0.9	0.70	0.00389
CONDOM	2.6	0.70	0.01123
DIAPHRAGM	0.3	0.70	0.00130
RHYTHM	2.8	0.70	0.01209
WHITDRAW	0.7	0.70	0.00302
OTHERS	0.3	0.70	0.00130
N.S.	1.6	0.00	0.00000
TOTAL	100	(e)= SUMe(i)/(u) =	0.8966

Fig.3.1.2.- B.C. A.S. % of CONTRACEPTIVE USERS.

CURRENT USERS, 1986 BCDS DATA.



Source: Tables 3.1.4. & 3.1.5.

The last measured component of the Proximate Determinants model, the Index of Postpartum Infecundability (Ci), also indicates that both the native and inmigrant populations could be located either among the last phase of the 'synthetic' fertility transition, or among the 'early' fertility decline group, within the overall limiting values that Ci has usually adopted for the countries of the Americas. That is to say that Ci has values above 0.9 for natives and inmigrants, and that significantly in this case Ci is lower for the latter group, which in turn indicates its higher diminishing effect upon inmimigrant's fertility.

As with the values of the other two determinants, the native and inmigrant Ci reflect differences between patterns and levels of its constituents. It should be noticed, for instance, that the proportions of women who breast-fed their last live birth among natives and inmigrants are 51.1% and 56.7%, respectively.

Among women who did breast-feed, furthermore, the mean duration of breast-feeding is 5.7 months in the case of the inmigrants, while the native population breast-feed an average of only 3.8 months (Table 3.1.6). Such low absolute durations of breast-feeding, nevertheless, involve very high relative proportional differences between the two groups, as indicated by the fact that the inmigrants' breast-feeding duration is 50.0% longer than that of the native population.

In spite of such a strong differential, when the absolute mean durations of breast-feeding are taken as input for the computation of the period of postpartum infecundability, the outcome is that the length of the period is 2.9 months for the native group and 3.6 months for the inmigrant population.

TABLE 3.1.6
B.C.: BONGAARTS' PROXIMATE DETERMINANTS OF FERTILITY. INDEX OF POST-PARTUM INFECUNDABILITY, 1986 BCDS DATA; TOTAL, NATIVE & INMIGRANT POPULATION.

Ci= INDEX OF POST-PARTUM INFECUNDABILITY= 20 /(18.5*i)

(i) Approx = 1.753 * EXP[(0.1396*B)-(0.001872*(B2))]

(B) = MEAN DURATION OF BREAST-FEEDING (months).

	(B)	(i)	Ci
TOTAL	5.15	3.42	0.9123
NATIVES	3.84	2.91	0.9339
INMIGRANT	5.66	3.64	0.9034

3.1.3.- Model's components combined effect and its decomposition.

The individual and combined effects of the indices of marriage, contraception, and postpartum infecundability upon the fertility levels of the total, native, and inmigrant populations can be appreciated in the corresponding values of TN, TM, and TF, which are presented in Table 3.1.1 and depicted in Figure 3.1.3.

In absolute terms the fertility reduction impacts of Cm, Cc, and Ci are, respectively, 1.67, 6.83, and 1.22 births for the inmigrant population; and, 1.99, 8.47, and 0.92 births in the case of the native group. Once these values are related to the total reduction from TF to TFR (11.4 & 9.7 for natives and inmigrants, respectively) the proportional contribution of Cm is 17.5% for the natives, and 17.1% for the inmigrants; those of Cc are 74.5% , and 70.3% in the same order, and; those of Ci are 8.0%, and 12.6%, respectively.

Although the absolute and relative contributions mentioned above give an indication of the different way in which the proximate determinants affect the fertility of natives and inmigrants, it has been suggested by Singh, et. al., (1985) that for the purposes of comparative analysis a decomposition of the differences between groups should be undertaken. That is to say, that the decomposition refers to the ratio of the TLFRs (i.e. $TLFR_{Inm}$ / $TLFR_{Nat}$), and the computed values[15] represent percentage differences in the TFRs, attributable to differences in the group's respective indices and estimated TFs.

The values computed with that formulation indicate that the percentage difference between TFRs is 21.0%; that the percentage points due to differences in Ci are -3.7%; due to Cc 17.8%; 16.4% due to Cm, and; -9.6% due to TF. From this set of figures there are at least three general considerations to underline.

First of all, it should be noticed that the contribution of TF to the proportional differences in TFRs is relatively high, but also and more important that it is in the expected direction, as indicated by the negative sign. That is to say that it seems to us that one can reasonably argue that in the case of the migrant population, a model's component not accounted for in this implementation such as spousal separation - which was not included due to the fact that individual-to-individual record linkages for wives and husbands in our data files are unachievable - could be behind the observed differences between TFs. Under such an assumption, for instance, a relatively plausible 8.33% rate of

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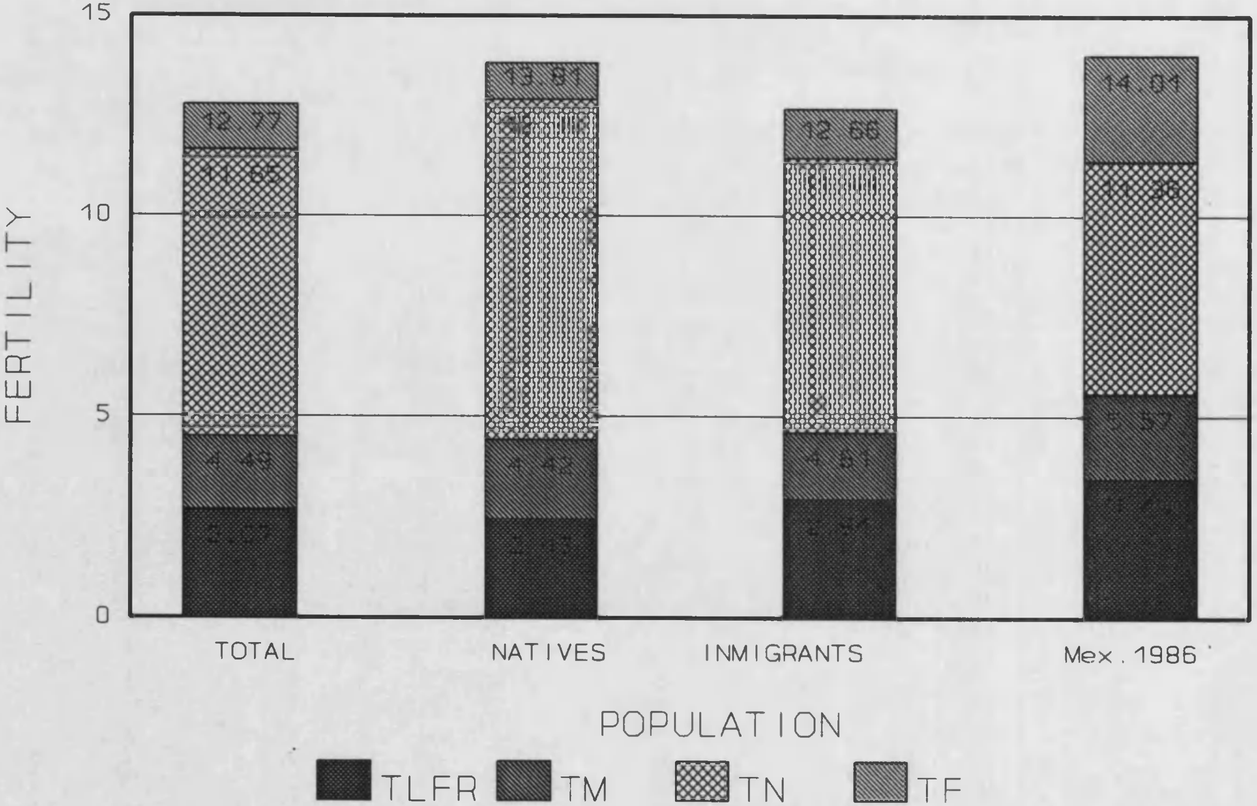
15.- The proportional contribution of, e.g., Ci is computed as:

$$Ci = \frac{Ln(CiInm)-Ln(CiNat)}{Ln(TLFRInm)-Ln(TLFRNat)} \{(TLFRInm / TLFRNat) - 1\}$$

where; Inm refers to Inmigrants, and Nat to Natives.

Fig. 3.1.3.- MEXICO & B.C. ESTIMATED TF, TN, & TM.
BONGAARTS' MODEL, 1987 MDHS & 1986 BCDS DATA.



Sources: Table 3.1.1, and SSA & DHS:1989;22-42.

NP-MWRA with their partners temporarily away would be enough to bring down the value of Cm to a level of 0.585, with which, in turn, the level of TFs would equalize.

Another possibility that can be considered in order to explain the differences in TF between the native and migrant groups, is that of induced abortion. In this case, however, for the values of the TF to equalize the index of abortion (Ca) of the migrant group[16] would have to be smaller than that of the natives (in order to increase more than proportionally the level of TF of the former group, since TF adjusted for induced abortion would be, TF = TLFR / Cm * Cc * Ca * Ci), and such relation would be at odds with previous empirical findings which have noticed that "the general rule appears to be an increase with urban residence and greater schooling, suggesting that the incidence of induced abortion is generally positively associated with urban residence and schooling" (Casterline,et.al.:1984;41), i.e. with modernization.

Since the native group seems to be more 'modernized' than the migrant group in terms of their reproductive behaviour, therefore, we contend that for these two groups the possibility of spousal separation being the main factor that explains the observed differences in the level of TF is more plausible than differences in induced abortion rates.

The second point to underline, is that the three indices of the model show the expected direction according to levels of modernization of the groups, given that the native

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16.- The index of abortion (Ca) has been defined (Bongaarts:1978;114) as:

Ca = 0.4 (1 + u) * TA

where;

u = proportion of all married women currently using contraception;

TA = average number of induced abortions per woman at the end of the reproductive period if induced abortion rates remain at prevailing levels throughout the reproductive period (excluding abortion to women not in union).

group seem to be more modern. In this case, the negative contribution of Ci is the result of the more 'traditional' pattern of breast-feeding observed for the inmigrant population, while the positive signs of the contributions of Cc and Cm indicate the rather 'modernized' behaviour of the native group.

Finally, the fact that the level of the values in the decomposition of the differences between TFRs indicate the predominance and almost equally shared influence of the indices of contraception and marriage in explaining the different patterns of reproductive behaviour between natives and inmigrants, should be noted and kept in mind.

3.2.- Proximate Determinants and Socio-Economic Factors.

3.2.1.- The socio-economic factors.

Having established the magnitude of the effects of the proximate determinants upon the fertility of the native and inmigrant populations, their ranking, and the composition of the differences between the TFRs of those two groups (Section 3.1), we now turn our attention to the analysis of the 'remote' or socio-economic factors which, in turn, are expected to affect the observed patterns of marriage, contraception, and post-partum infecundability.

As mentioned before (Section 1.2.2), one of the basic assumptions of the proximate determinants of fertility approach is that they are the main paths through which any social factors influencing the level of fertility must operate. In this regard, a variety of cross-national comparative studies based on WFS data have identified some of the socio-economic factors which seem to be more closely related to the intermediate variables.

For instance, in the case of marriage, considered as an approximate indicator of the start of a woman's exposure to the risk of childbearing, McCarthy, (1982) found that "urban versus rural residence and higher versus lower levels of education are strongly associated with the age at which a woman marries for the first time. Both urban women and women with relatively higher levels of education are less likely then their rural or less well-educated counterparts to be married by the end of their teenage years and are more likely to have a higher mean age at marriage" (Ibid;24).

In this same line of research but in relation to contraceptive use, Sathar & Chidambaram, (1984) concluded that "there is a strong positive association between the use of contraception and the level of urbanization of the place in which the respondent is usually resident...(also that)... Contraceptive use is clearly associated with educational attainment of the women.. with...higher education leading to higher use of contraception, (and that)..The work status of women as measured in those surveys did not seem to show any pattern of relationship with use of contraception" (Ibid;15, 27).

Likewise, in the case of breast-feeding duration, Ferry & Smith, (1983) demonstrated that "universally, the more urban the area a woman lives in the shorter her period of breast-feeding...Education which is not independent of... other socio-economic variables also plays a very important part in reducing the length of breast-feeding.....(decreasing monotonically with increasing education)...and also that... it appears that to have worked away from home reduces breast-feeding significantly" (Ibid;23,28).

Based on these previous experiences in identifying socio-economic factors related to the proximate determinants of fertility, and also on the limited amount of information available for these and other factors in the 1986 BCDS, we have chosen to analyze the effects of childhood place of residence, current place of residence, educational attainment, place of last live birth, and year of last live birth have on the marriage, contraceptive, and breast-feeding patterns of the native and inmigrant population of Baja California. This selection of independent variables was based on a series of tests of models (see subsection 3.2.2.3), in which we tried additional socio-economic factors - such as 'employment status' and/or 'current school attendance' - that did not improve significantly the models, and therefore were discarded.

3.2.2.- Technique, variables,and model selection.

3.2.2.1.- The technique.

Taking into consideration both the categorical nature of all our dependent and most of our independent variables, and the fact that the main aim of our analysis is that of assessing the different patterns of behaviour of the native and migrant groups, for the purpose of evaluating the effects of the above mentioned socio-economic factors upon the proximate determinants of fertility, we have used Log-linear modelling which has been operationalized through the use of the Logit model. This technique - being a specific version of the general Log-linear model - presents three features that should be mentioned here: (i) it allows the use of dependent categorical variables; (ii) it may be used when some or all of the independent variables are not categorical, and; (iii) it provides the effects of each category of the independent variables on the dependent variable (Aldrich & Nelson:1984).

In the Logit model the criterion analyzed is the Log of the Odds of the expected cell frequencies for the dependent variable[17]. Thus, the Logit model is a categorical variable analog to ordinary linear regression model for continuous

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17.- Here the odds are considered as the ratio between the frequency of being in one category and the frequency of not being in that category. Its interpretation is the relative chance that an individual selected at random will be observed to fall into the category of interest rather than into another category (Cf. Knoke,D. & Burke,P.:1980;9).

dependent variables, and the general formulation of the Logit model can be expressed as:

$$Ln\ (F_{1jk}/F_{2jk}) = 2\ (l_x + l_{xy} + l_{xn} \ldots + l_{xyn})$$

where:

x = the dependent variable;
y, n = the independent variables;
1, 2 = values of the categories of the dependent variable;
j, k = values of the categories of the independent variables;
F_{ijk} = Cell frequencies;

$l_x \ldots l_{xyn}$ = Lambda parameters;

and therefore;

$$\text{Conditional Odds} = Exp[2\ (l_x + l_{xy} + l_{xn} \ldots + l_{xyn})].$$

3.2.2.2.- The dependent and independent variables.

In order to evaluate the effects of the socio-economic factors on the proximate determinants of fertility, we have defined three dependent variables - which are the main proximate determinants of fertility - to be related in turn to specific sets of demographic controls, background, social, and contextual variables.

The first dependent variable to be evaluated is that of the proportion of women of reproductive ages currently married or in a consensual union. In this case we have included as independent variables the effects of; age-group (15-19, 20-29, and 30 & more); migratory status (migrant-native); type of current residence (urban-rural); educational attainment, classified with two categories which were defined as (a) up to complete primary, and (b) secondary and beyond, since the second educational-level category seeks to identify those women who have achieved an educational attainment above the Mexican compulsory level, which is that of full primary (i.e. six schooling years minimum).

The second dependent variable that we have used is that of the proportion of non-pregnant married women of reproductive ages (NP-MWRA) currently using any method of contraception. In this case the woman's age and the number of children ever born still alive (CEBSA) were used as the demographic covariates, while the factors included as categorical variables were those of; migratory status (migrant-native); type of residence at age 12 (rural-urban); educational attainment with two categories as above (up to full primary - above full primary), and; CEBSA with the categories of 0, 1, 2,and 3 and more[18].

For the purpose of analyzing the proxy of the third proximate determinant - proportions of women who breast-feed and the duration of breast-feeding - we have defined as dependent variable the proportion of NP-MWRA with at least one child ever born that breast-fed their last live birth for a maximum of three months; the woman's age at birth of the last child was used as a basic control through a linear covariate, while migratory status (migrant-native), educational attainment (two categories as above), place of last live birth (public health service's facilities or other), and year of last live birth (with the categories of 1986-85, 1984-83, 1982-81, and 1980 & before) were used as related socio-economic variables. Those two last independent variables in the breast-feeding model, have been included as 'proxies' for the assessment of both public-policy implementation of breast- feeding practice within the public health-services, and public-policy change over time in relation to the promotion of the breast-feeding practice. Additionally, in the case of the latter variable (i.e. 'year of last live birth') it should be noted that, given the limitations that have been identified for data sets which rely on the 'last open birth interval' information (see for instance, Page, Lesthaghe & Shah:1982; in relation to breast-feeding), we have discarded all the analyses concerning trends in breast-feeding duration

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18.- In this model we have used CEBSA instead of the total of children ever born (i.e. which includes all births regardless of survivorship status of the child) based on the assumption that contraceptive practice is more closely related to 'actual achieved family-size' than to total cumulative-fertility.

behaviour per-se.

The main limitation that this kind of information present is that it is affected by 'selection effects', due to the fact that "the probability that a single round-survey will be held during a particular interval is proportional to the length of that interval. Thus those intervals that are longer than a woman's average have a higher chance of being cut by such a survey and hence of being recorded as the current open birth interval than do shorter birth intervals" (Ibid;22).

This selection bias, furthermore, implies that women with short birth intervals "will be reporting on births that occurred more recently than women with long interbirth intervals. In short, the births do not refer to experience within the same period of time" (Ibid;15), and this precludes attempts to discern trends in breast-feeding duration over time.

3.2.2.3.- The model's test.

In order to evaluate the goodness of fit of the specified models, and to be able to select a parsimonious, statistically significant and simpler version of them, we have resorted to a three-phase procedure. The first phase of the procedure was achieved by computing the 'independence hypothesis' version of the specified models[19]. This allow us to define the upper-limit of Degrees of Freedom (DF) available within each model, as well as the maximum value for the Likelihood-ratio (L^2). These in turn, allow us to have a measurement of the departure between expected frequencies and

19.- We have termed 'independence-hypothesis' model that in which the dependent variable (D) distribution is assumed not to be affected by the independent (I,n) variable(s). Following the fitted marginals notation of Konke, D. & Burke,P. (1980; 20-32), we have used a single variable within brackets to indicate no direct effects (e.g. {D} {I} {n}); two variables within brackets for direct effects (e.g. {D,I} {D,n}), and; three or more variables in brackets for interactions (e.g. {D,I,n}).

actual cell entries (i.e. goodness of fit of the model) in the specified models, through the evaluation of the L^2 value relative to the available DF (Knoke & Burke:1980).

At the second phase of the procedure we computed the 'direct effects only' version of the specified models, with the purpose of defining a base-line goodness-of-fit level that would allow us both to evaluate the gains or losses in goodness-of-fit as interaction terms were included or deleted, and to measure the effects that different model versions had on the statistical significance (P) of the models.

The final phase of the procedure was that of testing different versions of the specified models, which included direct effects and interactions until an acceptable model could be selected, on the basis of its goodness-of-fit (L^2/DF), and statistical significance (P). The results of these three phases for the specified models are presented in Table 3.2.1.

From the data presented in that table, a first point to notice is that all direct effects versions of the three specified models, presented a value above unity for the ratio (L^2/DF), and that their statistical significance (P) was below 0.5.

The second general point that should be noticed is that all the selected versions of the three models involve a (L^2/DF) ratio below unity, which indicates - based on the criteria suggested by Knoke & Burke (1980) that "in trying to find the best-fitting logit model to describe a crosstabulation,..we want to find a low L^2 value relative to DF..(since that would indicate that)..the expected cell frequencies do not significantly differ from the observed data" (Ibid:30-31) - an improvement of the goodness-of-fit between the direct effects and the selected version of each of the three models, and that all versions had a significance level value very close to or well above 0.5.

Table 3.2.1
LOGIT MODELS FOR THE ODDS ON MARRIAGE, CONTRACEPTION, AND BREAST-FEEDING (1986, BCDS DATA).

M O D E L VARIABLES & INTERACTIONS	L^2	D.F.	P
A).- MARRIAGE:			
(no= 4,979)			
1) Independence;			
{M}{Ag}{Ms}{Cr}{Ea}	1591.1	23	.000
2) Direct effects;			
{M,Ag}{M,Ms}{M,Cr}{M,Ea}	35.5	18	.008
3) Selected;			
{M,Ag}{M,Ms}{M,Cr}{M,Ea}			
{M,Ag,Ea}{M,Cr,Ea}	11.6	15	.710
B).- CONTRACEPTION:			
(no= 2,638)			
1) Independence;			
{Cu}{Ms}{R12}{Ea}{CEBSA}			
{Lin.Covars.}	241.0	29	.000
2) Direct effects;			
{Cu,Ms}{Cu,R12}{Cu,Ea}			
{Cu,CEBSA}{Lin.Covars.}	24.1	23	.400
3) Selected;			
{Cu,Ms}{Cu,R12}{Cu,Ea}			
{Cu,CEBSA}{Lin.Covars}			
{Cu,Ea,CEBSA}	17.9	20	.592
C).-BREAST-FEEDING:			
(no= 2,418)			
1) Independence;			
{B}{Ms}{Plb}{Ea}{Ylb}			
{Lin.Cov.}	78.4	30	.000
2) Direct effects;			
{B,Ms}{B,Plb}{B,Ea}{B,Ylb}			
{Lin.Cov.}	27.9	24	.263
3) Selected;			
{B,Ms}{B,Plb}{B,Ea}			
{B,Ylb} {Lin.Cov.}			
{B,Plb,Ea}{B,Plb,Ylb}	19.5	20	.492

3.2.3.- The marriage model.

As mentioned above, the selected version of the model for the marriage pattern of the study's population included five variables, which were coded as follows: Current marital status (M) the dependent variable (0 = within union; 1 = outside union); the independent variables were, Age group (Ag; 0= <20, 1 = 20-29, 2 = 30 & more), Migratory Status (Ms; 0 = migrant, 1 = native), Current Type of residence (Cr; 0 = rural, 1 = urban) and, Educational Attainment (Ea; 0 = up to and including full primary, 1 = above full primary). This set of variables defines a 3*2*2*2 cells-table for each of the marriage variable's categories, and the results of the selected Logit model are presented in Table A.3.2.1 at the end of this chapter.

A first point to notice about the Lambda coefficients computed for the direct and indirect effects of the model, is that all show the expected directions on its influence. In other words, one could see a strong positive relationship between age-group and the proportions married; an inverse and significant association between educational attainment and the marriage pattern, and; negative parameter values for the urban and native population, which in turn indicate as expected, a reduction effect on the proportions married.

In the case of the interaction effects, the observed patterns of influence upon the marriage status distribution depicts a more mixed set of trends. Looking at these effects it can be observed that, while the interaction between current type of residence and educational attainment indicates a positive effect for the rural population and an inverse relation within the urban residents, the interaction between age-group and educational attainment is strong and inverse for the teenage and the 20-29 age-groups, and direct and significant for those above age 29.

The direction and magnitude of these effects can also be appreciated in its expression as the Conditional Odds for a woman to be within union, information which is presented in Table 3.2.2 and depicted in Figure 3.2.1. From the data in that table, a first point to notice is that of the wide range defined by the conditional odds values to be within union, since they vary from 0.09 for the teenage native-urban residents with educational attainment above full primary, to a value of 6.48 for the migrants aged 30 and above-rural residents with educational level above full primary.

TABLE 3.2.2
ODDS FOR WOMEN TO BE WITHIN UNION BY MIGRATORY STATUS, TYPE OF RESIDENCE, AGE GROUPS, AND EDUCATIONAL ATTAINMENT.

AGE GROUP / EDUCATIONAL ATTAINMENT	MIGRATORY STATUS			
	MIGRANTS		NATIVES	
	CURRENT RESIDENCE		CURRENT RESIDENCE	
	RURAL	URBAN	RURAL	URBAN
15-19				
UP TO FP	0.36	0.28	0.26	0.20
ABOVE FP	0.20	0.13	0.15	0.09
20-29				
UP TO FP	3.25	2.59	2.34	1.87
ABOVE FP	1.98	1.26	1.43	0.91
30 & MORE				
UP TO FP	5.24	4.18	3.78	3.02
ABOVE FP	6.48	4.14	4.68	2.99

Source: Computed from the values in Table A.3.2.1.
Note.- The equation used in the computation of the Conditional Odds (C.O.) for each cell was:

$$C.O.= Exp[2(l_{M}+l_{MAg}+l_{MMs}+l_{MCr}+l_{MEs}+l_{MAgEs}+l_{MCrEs})]$$

where; l = Lambda parameters.

A second general feature to notice, is that all the values of the conditional odds for natives to be within union are lower than the corresponding values for the migrant population; in all these cases, the values of the odds for the latter group are around 40.0% higher than those of the natives.

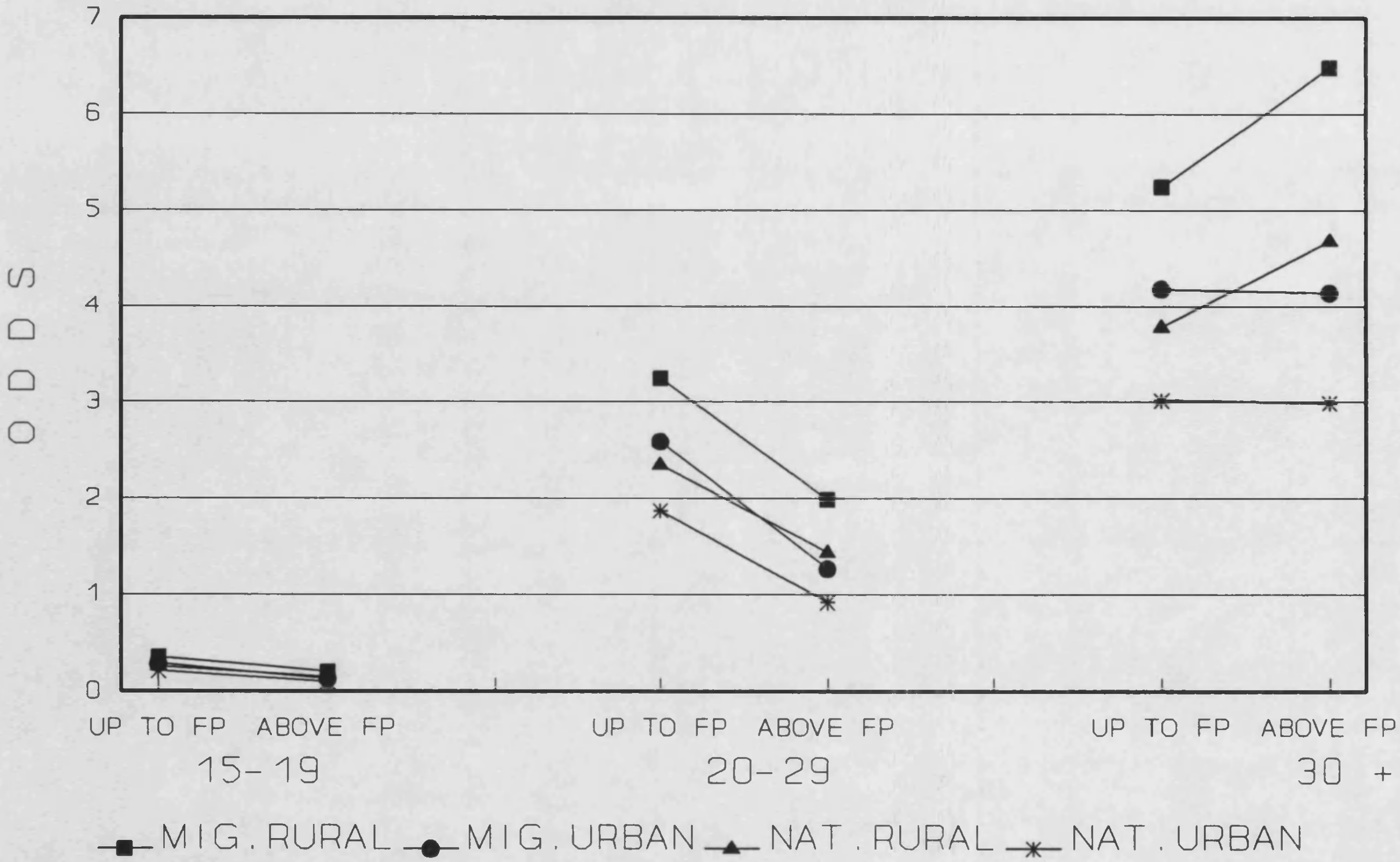
The third pattern that can be observed for the 15-19 age-group is that in the case of the migrant population the combined effects of current type of residence and level of educational attainment reduces the odds on marriage from almost 1 in 3 (1/0.36) when residence is rural and level of education is only up to full primary, to an almost 1 to 8 difference (1/0.13) in chance of being married when current type of residence is urban and the educational level is above full primary. The same pattern of effects can be observed for the native population, although it should be noticed that they are of a marginally higher magnitude, since for the corresponding groups the odds are 1:3.8 (1/0.26) and then they diminish to 1 to 11 (1/0.09), respectively.

The shape of that declining effect on the odds of being married by residence type and level of education both on the teenager group and on the 20-29 age-group, can be clearly appreciated in Figure 3.2.1. There one can also observe the change in the pattern of the effects once one considers the information for those in the 30 and more age-group (see Table 3.2.2).

In the case of the last age-group one is able to see that while for both migrants and natives residing in rural areas the effects of increasing levels of education tend to increase the odds for being married - from 5.2:1 to 6.5:1 for migrants , and from 3.8:1 to 4.7:1 for natives - the effects for the urban residents of both groups still shows an inverse relation. Those contrasting effects of educational level upon the shape of the urban and rural patterns of the conditional odds for being married in the age-group 30 and more are clearly depicted in Figure 3.2.1.

In relation to the observed pattern for the urban residents of the eldest group, it should be noticed that it may be associated with higher marital disruption amongst the better educated women of the urban areas than that of their rural counterparts a pattern which, at the same time, may be facilitated by the possibility that a woman with higher

Fig.3.2.1.- B.C. CONDITIONAL ODDS FOR WOMEN TO BE WITHIN UNION
(1986 BCDS DATA).



Source: Table 3.2.2.

educational attainment would be more likely to find employment in the urban than in the rural areas.

A final point to notice, from that same figure, is that of the hierarchical ordering that can be observed amongst the four migratory-residential categories. Here, for instance, one is able to see that at all ages and for all educational levels the migrant rural-resident group has the highest odds to be within union, while the native urban-resident population always show the lowest odds values, indicating that they are less likely to be married.

In the case of the up-to-full primary education-level, furthermore, for all age-groups the second highest odds values are for the migrant urban-resident group which is followed by the native rural-resident population, depicting a sort of native-urban to migrant-rural 'continuum', which changes at the above primary educational level where only the native-rural and the migrant-urban residents exchange positions in the ordering of the groups.

3.2.4.- The contraception model.

As was indicated in Sub-section 3.2.2.2, the selected version of the model for Contraceptive use had five categorical variables and two linear covariates. In this model, the dependent variable is that of Contraceptive use (Cu) which was coded with 0 = user of any method, and 1 = non-user; the linear covariates are age in completed years (Age), and the number of children ever born still alive (CEBSA); the independent variables used are Migratory Status (Ms; 0 = migrant, 1 = native), type of Residence at Age 12 (R_{12}; 0 = rural, 1 = urban), Educational attainment (Ea; 0 = up to and including full primary, 1 = above full primary), and the categorical version of the number of children ever born still alive (CEBSA; 0 = 0, 1 = 1, 2 = 2, 3 = 3 & more).

The selected version of the contraception model, as Table 3.2.1 indicates, includes the two linear covariates, all the direct effects, and the interaction between educational attainment and the categorical version of CEBSA. The values obtained for these parameters through the application of the Logit model, are presented in Table A.3.2.2 at the end of this chapter.

From the set of values displayed in the latter table, a first point to mention is that the signs and trend of the values of these parameters move in the expected direction, since they indicate that contraceptive use directly relates to achieved parity.

The second general feature to observe, is that in all three cases of the direct effects between contraceptive use and socio-economic variables the direction of its effects, as the signs for the Lambda values indicate, behave in the expected fashion. Here, for instance, one can see that as educational level increases so does contraceptive use; that an urban socialization environment at age 12 increases the chances of using contraception, relative to those socialized in rural areas, and; that native women tend to use contraception in higher proportions than those who are migrants.

The direction and magnitude of all those effects can also be appreciated in its expression as the conditional odds for a NP-MWRA to be using contraception, information which is presented in Table 3.2.3, and depicted in Figure 3.2.2. From the data in that table, a first point to mention is that of the very wide range defined by the values of the odds for using contraception, which starts as low as 0.3:1 and ends up as high as 10.7:1. Such a range suggests that the independent variables included in this model do have a strong influence on behaviour.

A second set of general patterns that one is able to observe from the information in Table 3.2.3, are those related to the clear-cut differences in contraceptive use between the migrant and native populations, and between the urban and rural socialized groups. In the case of the former groups, all categories of the native population have conditional odds' values that are almost 30.0% higher than those of the corresponding migrant group.

A similar situation can be detected when one distinguishes between those who were socialized in an urban environment and those who were not, since for the former the conditional odds for contraceptive use are always 40.0% higher than those included in the latter socialization area.

TABLE 3.2.3
ODDS FOR NPMWRA USING CONTRACEPTION BY MIGRATORY STATUS, TYPE OF RESIDENCE AT AGE 12, PARITY ORDER, AND EDUCATIONAL ATTAINMENT.

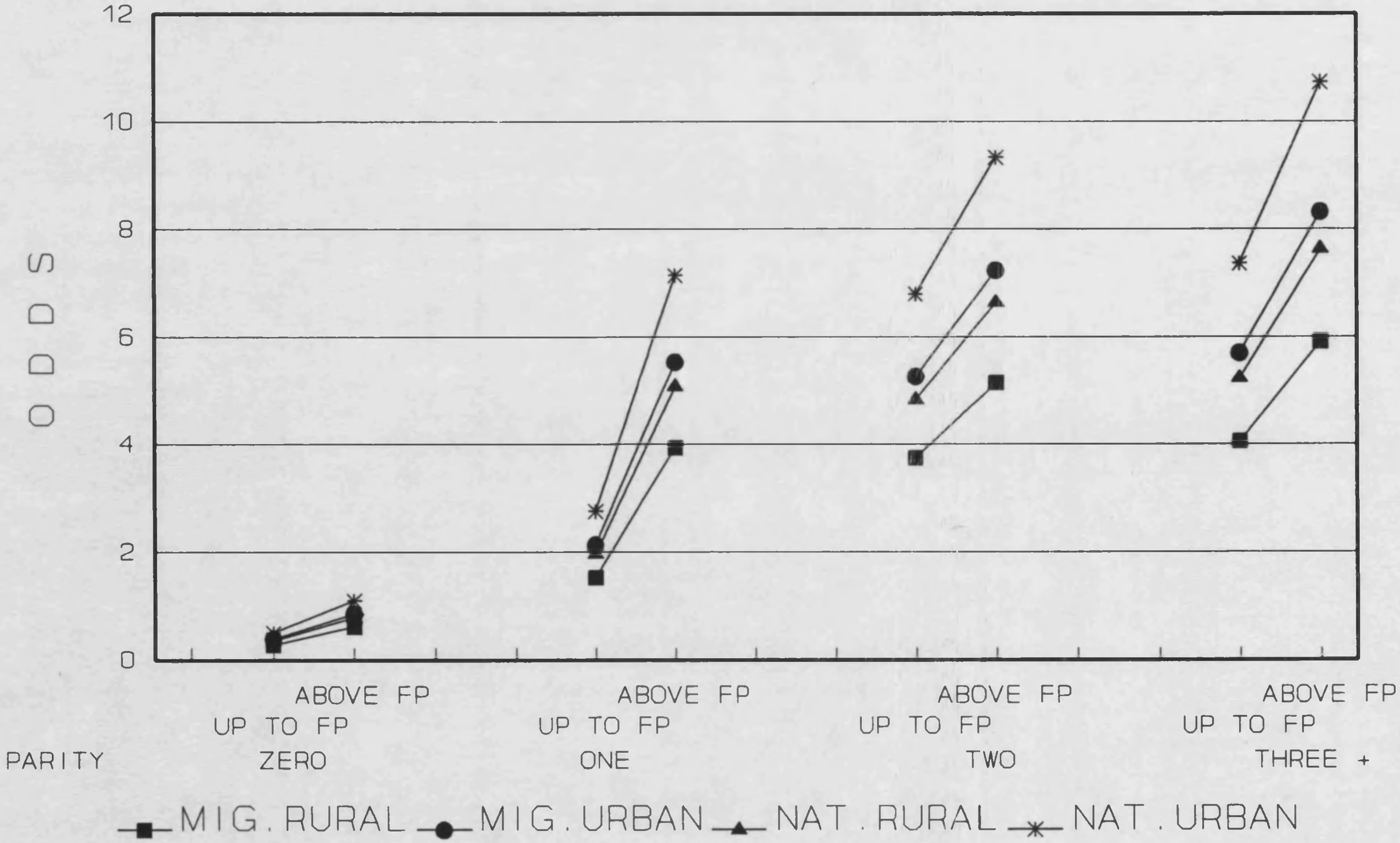
CHILDREN E.B. STILL ALIVE / EDUCATIONAL ATTAINMENT	MIGRATORY STATUS			
	MIGRANTS		NATIVES	
	RESIDENCE AT AGE 12		RESIDENCE AT AGE 12	
	RURAL	URBAN	RURAL	URBAN
ZERO				
UP TO FP	0.28	0.39	0.36	0.50
ABOVE FP	0.60	0.85	0.78	1.09
ONE				
UP TO FP	1.51	2.13	1.95	2.75
ABOVE FP	3.93	5.53	5.07	7.13
TWO				
UP TO FP	3.74	5.26	4.82	6.79
ABOVE FP	5.14	7.23	6.63	9.33
THREE & MORE				
UP TO FP	4.05	5.70	5.23	7.35
ABOVE FP	5.91	8.31	7.63	10.73

Source: Computed from the values in Table A.3.2.2.
Note.- The equation used in the computation of the Conditional Odds (C.O.) for each cell was:

$$C.O. = Exp[2(l_{Cu}+l_{Age}+l_{CEBSA}+l_{CuMs}+l_{CuR12}+l_{CuEa}+l+l_{CuEaCEBSA})]$$

where; l = Lambda parameters.

Fig.3.2.2.- B.C. CONDITIONAL ODDS FOR NPMWRA USING CONTRACEPTION (1986 BCDS DATA).



Source: Table 3.2.3.

The combination of those general trends defines a constant ranking amongst the four groups considered, in which the urban-socialized natives always have the highest odds for contraceptive use; they are followed by the urban-socialized migrants; then came the rural-socialized natives, and; finally one can find the migrants who were socialized in rural areas showing the lowest values in the odds for contraceptive use, as the data depicted in Figure 3.2.2 clearly indicate.

A further point to notice is that of the changing magnitude of the effects that the attained level of education generates on the values of the odds for contraceptive use, as one looks across the achieved parity categories. Within the main finding that for all groups and categories those with higher levels of education have higher odds to be using contraception than those with lower educational attainment, the pattern of changing effects starts by increasing from 114.0% (i.e. Above F.P./Up to F.P.) at parity zero to 160.0% at parity one; then it drops to 37.0% at parity two, and then the difference between the two educational groups grows again at parity 3 plus where it is about 46.0%. That process, which is well depicted by the changing distance between the educational categories within each parity level included in Figure 3.2.2, seems to suggest that the educational-differences in contraception use tend to be attenuated by increase parity and, therefore, that contraceptive use is increasingly a parity-oriented behaviour.

The final point to be mentioned about the odds computed from the contraception model, is one related to the changing effects that achieved parity exerts upon the odds for using contraception. In this regard it should be noticed that at parity zero all those women with an educational level of only up to full primary have a 1:2 (1/0.5) or lower conditional odds to be using contraception, and that at this same parity those women with an educational attainment above full primary have - at best - a marginally better than 1:1 chance of using contraception.

This range of odds, in our view, suggests that it is only amongst the group of urban-socialized natives - and by definition current urban residents - that one can find a marginally more likely than-not behaviour of contraceptive use for the purposes of delaying the start of childbearing within union.

From that point onwards, however, there is a remarkable increase in the odds for contraceptive use as one looks across the achieved parity categories. At parity one, for example, the lowest odds for contraceptive use in this category are higher than the highest odds at parity zero (see Fig. 3.2.2), and the former indicates that at parity one and within the low educational level group at least 3 out of 5 (1.5:1) women would be resorting to contraception.

Furthermore, in the case of those women with an educational level above full-primary - still at parity one - the odds for using contraception range from almost 4 out of 5 (3.9:1) for the rural-socialized migrants, to more than 7 out of 8 (7.13:1) for the urban-socialized natives. The magnitude of the change on the odds for contraceptive use between parity zero and parity one - which involves an increase in the odds by a factor 5.4 for the low educational level group, and by a factor of 6.5 for the above full primary group - seems to suggest, that there are strong indications that at parity one there is a pattern of behaviour of contraceptive use associated with birth-spacing purposes.

Turning now to the next parity category (parity two) one can see that the magnitude of the changes in the odds' values for contraceptive use are less strong between parity one and parity two than in the preceding case (i.e from zero to one), but it also should be noticed, however, that in the case of the group with low educational attainment level the odds increase by a factor of 2.5 (i.e. they are more than twice as high as those corresponding to parity one), and that the odds for the group with high educational level are about 30.0% higher than at the previous parity level.

At parity order two, therefore, the conditional odds for contraceptive use indicate that the proportions of current users range from virtually 80.0% (i.e. 3.74:1, or 15 out of 19), up to more than 9 out of 10 married women of reproductive ages (9.3:1).

The facts that such high proportions of users are achieved at a relatively low parity order of two, and also that they only increase marginally at higher parity orders (defining a range between 80.2% and 91.5% of users at parity 3 and more), allow us to conclude that alongside with the previously mentioned pattern of birth-spacing, there is child-stopping behaviour especially found amongst both migrants and natives who were socialized in an urban environment and who have an educational attainment level above full primary (i.e their odds at parity two are above 7:1 and 9:1, respectively).

3.2.5.- The breast-feeding model.

As it was indicated in Subsection 3.2.2.2, for the purpose of analyzing the proxy of the third proximate determinant - breast-feeding - we have defined as our dependent variable the proportions of NP-MWRA that have had at least one child ever born and breast-fed their last live birth for a maximum of three months[20].

In our selected version of the prevalence and duration of breast-feeding - as can be seen in Table 3.2.1 - the dependent variable was defined and coded as Breast-feeding Duration (Bd; 0 = up to 3 months, 1 = more than 3 months), while the independent variables were defined and coded as follows: Age of the mother at birth of the last child as a

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20.- The choice of three months as a cutting point is based on the consideration that breast-feeding durations of a maximum of three months would have an almost negligible reducing effect upon natural marital fertility (i.e. less than 5.0%) as the values of Ci would be 0.95 or higher.

linear covariate; Migratory Status (Ms; 0 = migrant, 1 = native); Place of last live birth (Plb; 0 = Public Health service, 1 = Other than public); Educational attainment (Ea; 0 = up to full primary, 1 = above full primary), and; Year of last live birth (Ylb; 0 = 1986-85, 1 = 1984-83, 2 = 1982-81, 3 = 1980 & before).

With those definitions we have computed the Logit parameters for the variables and interactions included in the selected version of the model, and its results are presented in Table A.3.2.3 at the end of this chapter. From the data presented in that table the main point to be made is that of the direction of the effects of the independent variables upon the odds for breast-feeding a maximum of three months. In this regard the sign of the Lambda parameters allow one to observe that being a native, having being attended at a public health service facility during the last live birth delivery, and being educated above the full primary level, all have an increasing effect on the odds that breast-feeding would last for a maximum of three months.

The direction and magnitude of the effects of the independent variables within the breast-feeding model, can be more clearly appreciated in its expression as Conditional Odds, information which is presented in Table 3.2.4 and depicted in Figure 3.2.3. In this case a first point to be mentioned is that of the relatively wide range defined by the odds values included in the table. Here the odds range from a value just below 2:1 (1.84:1) up to a value of almost 8:1 (7.88:1), which in our view indicates that the independent variables included in the model, do capture a substantial amount of the variation that can be observed in the patterns of breast-feeding.

One of those general patterns of variation that can be identified from the odds' values, is that related to the fact that within comparable categories (i.e. same type of health service, educational attainment, and time period) the native population always has the highest odds' values. In other words, that the pattern of odds indicates that natives are more likely than migrants to breast-feed for a maximum of three months.

TABLE 3.2.4
ODDS FOR NPMWRA WITH AT LEAST ONE CEB BREAST-FEEDING A MAXIMUM OF THREE MONTHS BY MIGRATORY STATUS, PLACE OF LLB, YEAR OF LLB, AND EDUCATIONAL ATTAINMENT.

YEAR OF LAST LIVE BIRTH EDUCATIONAL ATTAINMENT	MIGRATORY STATUS			
	MIGRANTS		NATIVES	
	PLACE OF LLB		PLACE OF LLB	
	Publ.Ser.	Non Publ.	Publ.Ser.	Non Publ.
1986-1985				
UP TO FP	4.43	2.52	7.88	4.48
ABOVE FP	4.41	3.93	7.85	6.99
1984-1983				
UP TO FP	2.67	1.84	4.75	3.26
ABOVE FP	2.66	2.86	4.73	5.09
1982-1981				
UP TO FP	2.27	1.94	4.04	3.46
ABOVE FP	2.26	3.03	4.02	5.39
1980 & Bef.				
UP TO FP	2.37	2.39	4.21	4.25
ABOVE FP	2.36	3.73	4.19	6.63

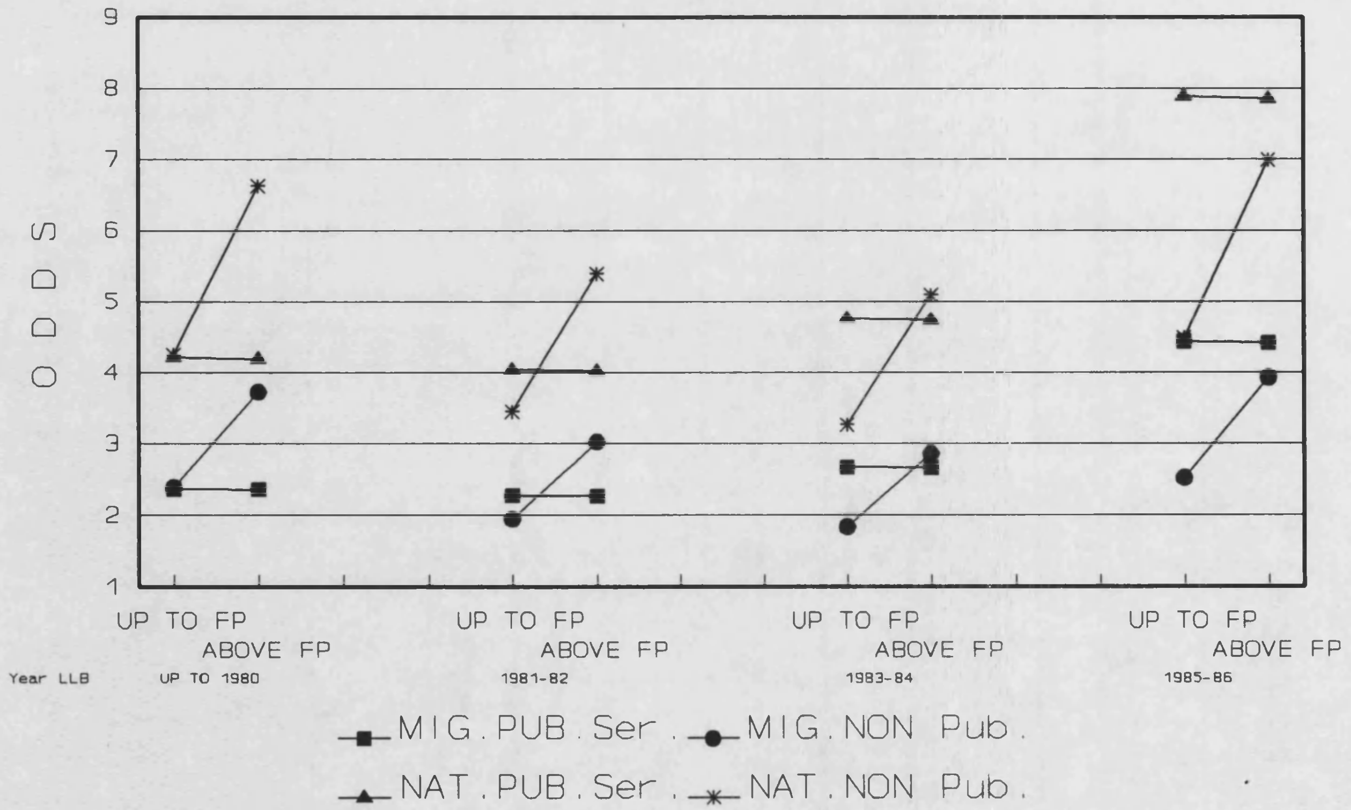
Source: Computed from the values in Table A.3.2.3.
Note.- The equation used in the computation of the Conditional Odds (C.O.) for each cell was:

$$C.O.=Exp[2(l_{B}+l_{Age}+l_{BMs}+l_{BPlb}+l_{BEa}+l_{BYlb}+l_{BPlbEa}+l_{BPlbYlb}+l_{BEaYlb})]$$

where; l = Lambda parameters.

The second general feature that can be observed from the data in Table 3.2.4 is that, in half of the categories considered, those women delivering at public health service facilities have higher odds' values than those who used non-public health facilities. Such a pattern of odds, which is

Fig.3.2.3.- B.C. CONDITIONAL ODDS FOR NPMWRA B-F ONLY UP TO 3 MONTHS (1986 BCDS DATA).



Source: Table 3.2.4.

mainly concentrated in the births that took place during the two most recent periods, leads one to suggest that both migrant and native women who had their last live birth in a public sector health facility, were less likely to breast-feed for more than three months than those who had their last delivery at a non-public health service.

A further point to notice from the data in that table, is that concerned with the effects that educational attainment level has upon the odds for breast-feeding. In this case, as Figure 3.2.3 depicts, one can see that for those delivering at non-public health service facilities and for all periods being considered, those women with higher educational levels were less likely to breast-feed for a maximum of three months than those women with an educational level of only up to full primary. However, for those women who delivered their last live birth at the public health service facilities, it seems that there is no difference in breast-feeding patterns between those with low or high levels of educational attainment, although this may be a result of the small number of cases of women with higher education resorting to public health services (see, Table A.3.2.3).

The final point to be made in relation to these data, is the one related to the patterns that the odds' values allow one to identify within the time period-being considered (i.e. 1980s). In this regard - keeping in mind the limitations mentioned above in Subsection 3.2.2.2 - one is able to see that for both natives and migrants who had their last live birth at non-public health service facilities, the odds for breast-feeding up to three months decline within the three earlier periods included, and that there is a reversal of that pattern in the latest period considered when all of the odds' values for these categories 'bounce-up' and increase about 37.0% in relation to their preceding values.

On the other hand, one can also see that for those women who used the public-sector health facilities during their last live birth, the odds' values have been increasing over time at a pace that made them almost double their value between 1981 and 1986 a pattern that - with all its previously mentioned limitations - seems to indicate that the likelihood that breast-feeding lasts for no more than three months is getting greater the more recent the birth, amongst those births being attended at the public health service facilities.

3.2.6.- Discussion.

The main purposes of this section have been those of assessing the strength and direction of the relationships between the proximate determinants of fertility and several selected socio-economic characteristics, and that of assessing the different patterns of behaviour of both the native and inmigrant populations of Baja California. In order to achieve such aims, we have analyzed the conditional odds of the dependent variables, computed through the Logit version of the Log-linear general model.

In relation to the first of those aims, the results of these procedures allowed us to establish that when the proportions of women of reproductive ages within union were considered as the dependent variable in the selected model, the direction of the direct effects of the independent variables were in line with what was expected, i.e. for instance, those who reside in the rural areas of the state have always higher odds than the urban population for being married.

A further characteristic that has been shown, is that within sub-groups analyzed the migrant population had odds for being within union that were 40.0% higher than the corresponding to the native group.

In the case of the effects of educational attainment upon the odds for being within union, it was also observed that for both natives and migrants they varied according to age-group and type of current residence. For teenagers and for the 20-29 age-group, for instance, it was found that the relationship is strong and negative for both rural and urban residents, since the higher their educational level the lower their odds to be within union.

In the 30 and above age-group, we were able to notice that there is the same type of inverse relationship as in the teenager group between educational attainment and the odds for being within union for those residing in the urban areas, but that for the rural population the shape of the pattern of effects is inverted, since high educational level tends to increase the odds to be within union, in relation to the odds for those women with only up to full primary level of education.

Finally we were also able to see that, within all age-groups, there were clear hierarchical ordering patterns that seem to suggest a native-urban to migrant-rural 'continuum', in which the native-urban population always shows the lowest odds to be within union, while the migrant-rural group always had the highest odds of being within union.

The second dependent variable assessed was that of the proportions of NP-MWRA using any method of contraception. In this model, the independent variables' direct effects were also observed to have a clear influence on the odds of using contraception, since it was noted that as the educational level increases so do the odds for contraceptive use; also, that those women who were socialized in a urban environment up to age 12 have odds for contraceptive use that are 40.0% higher than those of women whose residence at age 12 was a rural area, and; that the native group of women have odds for using contraception that are 30.0% higher than those of the corresponding migrant population of the state.

The combination of the magnitude and direction of these general effects of the independent variables on the odds' values for using contraception, defined a clear cut ranking of the groups according to their socialization environment and migratory status, in which the urban-socialized natives have the highest odds for contraceptive use; they are followed, in decreasing order of their odds' values, by the urban-socialized migrants; then by the rural-socialized natives, and; lastly by the rural-socialized migrants. Such a pattern or group ranking, in our view, suggests the presence of a differential access to contraceptive methods between the urban and rural areas of Baja California, since for the native population, current and childhood place of residence are the same by definition.

In the case of the educational attainment variable within the contraception model, it was observed that its effects changed according to achieved parity - although it should be said that those with higher educational level always have higher odds for the use of contraception. At parity zero, for instance, those with higher educational attainment have odds that are 114.0% higher than those with only up to full primary educational level; at parity one the difference between educational levels increases to 160.0%; then at parity two it drops to 37.0%, and; at parities 3 and more the difference increases again up to 46.0% in favour of those with higher educational attainment.

The effects of the remaining independent variable, achieved parity, allowed us to identify what we consider to be three well-defined patterns of contraceptive-use behaviour amongst the study's population:

i) It was shown that at parity zero most of the odds for the use of contraception do not go above the level of 1:1, and we found, therefore that with the exception of the urban-socialized natives with a high level of education, there is no evidence of a more likely than not pattern of contraceptive use for the purpose of delaying the start of childbearing within union;

ii) We were also able to observe that the magnitude of the change in the values of the odds for contraceptive use between parity zero and parity one - by factors of more than five for all categories included - do, in our view, strongly suggest that there is evidence of a pattern of contraceptive use associated with the purposes of spacing between the first and the second birth, and;

iii) The level of contraceptive use achieved at parities two and more (i.e. which are above 80.0% for all groups), may be considered as an indication that along with the birth spacing pattern previously mentioned, there seems to be at least some child-stopping behaviour at relatively low parities, especially amongst those who were socialized in a urban environment and that have attained an educational level above full primary.

The third dependent variable that was assessed through our selected version of the Logit model, was that of the proportions of NP-MWRA that breast-fed their last live birth for only a maximum of three months. In this case the direction of the effects of the independent variables allow us to observe three clear patterns of odds distributions. The first one is that the natives have higher odds than the migrants to breast-feed for only a maximum of three months; the second one, is that the odds for short breast-feeding durations (i.e. of only up to three months) are predominantly higher for those births that took place at the public health service facilities, when compared to those values corresponding to births attended at non-public health services, and; the third one is that it was observed that those women who have achieved an educational level above full primary, have higher odds to breast-feed for only a maximum of three months than those women with an educational attainment of up to full primary, but only when delivery of the last live birth took place at a non-public health service facility.

In combination the magnitude and direction of these effects allow us to identify two patterns of the odds for breast-feeding during the periods being considered which, nevertheless - due to the biased nature of the last-open birth interval information on which they are based - should be taken only as preliminary indications of potential trends in the pattern of breast-feeding behaviour. The first one is the pattern of both the native and migrant groups who delivered their last live birth at a non-public health service facility, in which the odds' values decline for the three earlier periods, but also a reversal during the latest period when their odds increased by 37.0%.

The second pattern is that both natives and migrants who resorted to public health service facilities during their last live birth, show increasing odds values for breast-feeding for only a maximum of three months in all the periods included - at a pace that made them almost double their value between 1981 and 1986. This trend, with all its limitations, seems to be in line with previously reported analyses (Keller, et.al.:1981. Cited in, Bongaarts & Menken: 1983) which indicate that for Mexico as a whole there is a pattern of decreasing duration and proportions breast-feeding.

Both this last pattern and the fact that the majority of the educational/migratory categories of the two latest periods included show a greater likelihood for women who delivered their last live birth at public-health service facilities to breast-feed for shorter periods than their corresponding counterparts who delivered at non-public health services, seems to indicate - as other recent studies have done (See, SSA & DHS:1989) - that the promotion of breast-feeding within the public-health service, and the enforcement of a key factor of the 'mother-child health care' approach that has been recently adopted by the official Mexican family planning program are two issues that, we suggest, deserve further examination in order to ascertain with ad hoc data whether or not these patterns are the prevailing ones and, if they are, to identify the areas of possible intervention that may allow the public policy objectives to coincide with their implementation.

Finally, it should be noticed and kept in mind that in relation with our second aim of assessing the different patterns of behaviour between the native and migrant groups, the results presented in this section have allowed us to observe two clearly-defined and uniform sets of features.

The first is that even after controlling for the available demographic and socio-economic factors, the native and migrant groups show two well differentiated patterns of behaviour since - for all the categories considered - migrants are more likely than natives to be within union; to have lower proportions using contraceptives, both for first-birth delay and/or birth-spacing, and for childbearing stopping purposes, and; to breast-feed their children for longer periods.

The second is that the two models that take into account the 'type of place of residence' effects (i.e. current residence in the marriage model, and residence at age 12 in the contraception model), there is evidence of a hierarchical ordering that depicts a native-urban to migrant-rural 'continuum' in terms of a range of differentiated marriage and contraception patterns of behaviour between those four sub-groups.

The combination of those two sets of features, from our perspective, strongly suggest that these differentiated patterns of reproductive behaviour that have been found amongst the native and migrant groups of Baja California's population, may very well be the outcome of the interaction between factors concerning the residential background characteristics of those groups, an issue that we shall be dealing with at length in the following chapter.

TABLE A.3.2.1
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF MARRIAGE (1986 BCDS DATA).

MARRIAGE	
Variables & Effects	**Parameters (Lambda)**
$M_{(within\ union)}$	0.063357
$M_{(w/u)}Ag_{(<20)}$	-0.887811
$M_{(w/u)}Ag_{(20-29)}$	0.235697
$M_{(w/u)}Ag_{(>29)}$	0.652114
$M_{(w/u)}Ms_{(mig)}$	0.081536
$M_{(w/u)}Ms_{(nat)}$	-0.081536
$M_{(w/u)}Cr_{(rur)}$	0.084534
$M_{(w/u)}Cr_{(urb)}$	-0.084534
$M_{(w/u)}Ea_{(ufp)}$	0.098185
$M_{(w/u)}Ea_{(afp)}$	-0.098185
$M_{(w/u)}Ag_{(<20)}Ea_{(ufp)}$	0.070364
$M_{(w/u)}Ag_{(20-29)}Ea_{(ufp)}$	0.053146
$M_{(w/u)}Ag_{(>29)}Ea_{(ufp)}$	-0.123510
$M_{(w/u)}Ag_{(<20)}Ea_{(afp)}$	-0.070364
$M_{(w/u)}Ag_{(20-29)}Ea_{(afp)}$	-0.053146
$M_{(w/u)}Ag_{(>29)}Ea_{(afp)}$	0.123510
$M_{(w/u)}Cr_{(rur)}Ea_{(ufp)}$	-0.027864
$M_{(w/u)}Cr_{(urb)}Ea_{(ufp)}$	0.027864
$M_{(w/u)}Cr_{(rur)}Ea_{(afp)}$	0.027864
$M_{(w/u)}Cr_{(urb)}Ea_{(afp)}$	-0.027864

Note.- The variables included in this model are: Current marital status(**M**) the dependent variable (0 = within union; 1 = outside union); the independent variables were, Age group (**Ag**; 0= <20, 1 = 20-29, 2 = 30 & more), Migratory Status (**Ms**; 0 = migrant, 1 = native), Current Type of residence (**Cr**; 0 = rural, 1 = urban) and, Educational Attainment (**Ea**; 0 = up to and including full primary, 1 = above full primary). Total sample size = 4979 cases: Distribution of total sample by variables categories; (**M**) within union = 57.1%, outside union = 42.9%; (**Ag**) age <20 = 23.4%, age 20-29 = 36.7%, age 30 & more = 40.0%; (**Ms**) migrant = 62.3%, native = 37.7%; (**Cr**) rural = 22.9%, urban = 77.1%; and, (**Ea**) up to and including full primary = 45.2%, above full primary = 54.8%

TABLE A.3.2.2
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF CONTRACEPTION (1986 BCDS DATA).

CONTRACEPTION	
Variables & Effects	**Parameters (Lambda)**
$Cu_{(user)}$	0.150868
$Age_{(Lin.Covar)}$	0.011734
$CEBSA_{(Lin.Covar)}$	0.368661
$Cu_{(user)}Ms_{(mig)}$	-0.063778
$Cu_{(user)}Ms_{(nat)}$	0.063778
$Cu_{(user)}R12_{(rur)}$	-0.085300
$Cu_{(user)}R12_{(urb)}$	0.085300
$Cu_{(user)}Ea_{(ufp)}$	-0.151970
$Cu_{(user)}Ea_{(afp)}$	0.151970
$Cu_{(user)}CEBSA_{(0)}$	-0.831960
$Cu_{(user)}CEBSA_{(1)}$	0.063492
$Cu_{(user)}CEBSA_{(2)}$	0.356766
$Cu_{(user)}CEBSA_{(3+)}$	0.411702
$Cu_{(user)}Ea_{(ufp)}CEBSA_{(0)}$	-0.043500
$Cu_{(user)}Ea_{(ufp)}CEBSA_{(1)}$	-0.086430
$Cu_{(user)}Ea_{(ufp)}CEBSA_{(2)}$	0.072355
$Cu_{(user)}Ea_{(ufp)}CEBSA_{(3+)}$	0.057575
$Cu_{(user)}Ea_{(afp)}CEBSA_{(0)}$	0.043500
$Cu_{(user)}Ea_{(afp)}CEBSA_{(1)}$	0.086430
$Cu_{(user)}Ea_{(afp)}CEBSA_{(2)}$	-0.072355
$Cu_{(user)}Ea_{(afp)}CEBSA_{(3+)}$	-0.057575

Note.- The variables included in this model are: Contraceptive use (**Cu**) the dependent variable (0 = user of any method, and 1 = non-user); the linear covariates are the discrete variables of age (**Age**), and the number of children ever born still alive (**CEBSA**); the independent variables used are Migratory Status (**Ms**) (0 = migrant, 1 = native), type of Residence at Age 12 (R_{12}) (0 = rural, 1 = urban), Educational attainment (**Ea**) (0 = up to and including full primary, 1 = above full primary), and the categorical version of the number of children ever born still alive (**CEBSA**) (0 = 0, 1 = 1, 2 = 2, 3 = 3 & more). Total sample size = 2638 cases: Distribution of total sample by variables categories; (**Cu**) user = 62.9%, non-user = 37.1%; (**Ms**) migrant = 71.5%, native = 28.5%; (R_{12}) rural = 50.5%, urban = 49.5%; (**Ea**) up to and including full primary = 56.7%, above full primary = 43.3%; and, (**CEBSA**) 0 = 7.5%, 1 = 16.0%, 2 = 21.5%, 3 & more = 55.0%.

TABLE A.3.2.3
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF BREAST-FEEDING (1986 BCDS DATA).

BREAST-FEEDING	
Variables & Effects	**Parameters (Lambda)**
$Bd_{(<=3)}$	0.672650
$Age_{(Lin.Covar)}$	-0.022413
$Bd_{(<=3)}Ms_{(mig)}$	-0.144044
$Bd_{(<=3)}Ms_{(nat)}$	0.144044
$Bd_{(<=3)}Plb_{(pub)}$	0.011838
$Bd_{(<=3)}Plb_{(non)}$	-0.011838
$Bd_{(<=3)}Ea_{(ufp)}$	-0.054977
$Bd_{(<=3)}Ea_{(afp)}$	0.054977
$Bd_{(<=3)}Ylb_{(86-5)}$	0.152036
$Bd_{(<=3)}Ylb_{(84-3)}$	-0.053857
$Bd_{(<=3)}Ylb_{(82-1)}$	-0.080126
$Bd_{(<=3)}Ylb_{(80..)}$	-0.018053
$Bd_{(<=3)}Plb_{(pub)}Ea_{(ufp)}$	0.056028
$Bd_{(<=3)}Plb_{(pub)}Ea_{(afp)}$	-0.056028
$Bd_{(<=3)}Plb_{(non)}Ea_{(ufp)}$	-0.056028
$Bd_{(<=3)}Plb_{(non)}Ea_{(afp)}$	0.056028
$Bd_{(<=3)}Plb_{(pub)}Ylb_{(86-5)}$	0.073200
$Bd_{(<=3)}Plb_{(pub)}Ylb_{(84-3)}$	0.025968
$Bd_{(<=3)}Plb_{(pub)}Ylb_{(82-1)}$	-0.028746
$Bd_{(<=3)}Plb_{(pub)}Ylb_{(80..)}$	-0.070422
$Bd_{(<=3)}Plb_{(non)}Ylb_{(86-5)}$	-0.073200
$Bd_{(<=3)}Plb_{(non)}Ylb_{(84-3)}$	-0.025968
$Bd_{(<=3)}Plb_{(non)}Ylb_{(82-1)}$	0.028746
$Bd_{(<=3)}Plb_{(non)}Ylb_{(80..)}$	0.070422

Note.- The variables included in this model are: Breast-feeding Duration (**Bd**) the dependent variable (0 = up to 3 months, 1 = more than 3 months); Age (**Age**) of the mother at birth of the last child as a linear covariate; the independent variables, Migratory Status (**Ms**) (0 = migrant, 1 = native); Place of last live birth (**Plb**) (0 = Public Health service, 1 = Other than public); Educational attainment (**Ea**) (0 = up to full primary, 1 = above full primary), and; Year of last live birth (**Ylb**) (0 = 1986-85, 1 = 1984-83, 2 = 1982-81, 3 = 1980 & before). Total sample size = 2418 cases: Distribution of total sample by variables categories; (**Bd**) up to 3 months = 76.6%, more than 3 months = 23.4%; (**Ms**) migrant = 72.7%, native = 27.3%; (**Plb**) Public Health service = 50.7%, Other than public = 49.3%; (**Ea**) up to full primary = 58.4%, above full primary = 41.6%; and, (**Ylb**) 1986-85 = 28.4%, 1984-83 = 21.4%, 1982-81 = 12.9%, 1980 & before = 37.3%.

IV.- TESTS OF HYPOTHESES.

4.1.- Introduction.

The main purpose of this chapter is to empirically test, with the data from the 1986 BCDS, the relevant demographic hypotheses concerning the relationship between migration and fertility. As mentioned before (Section 1.1.1) there are four hypotheses that relate the migratory status of a population to its fertility behaviour.

Briefly stated, the first of those hypotheses - the Socialization hypothesis - assumes that the reproductive performance of migrants reflects the fertility preferences prevalent in their childhood environment. Therefore, convergence in the fertility level of migrants toward those of the receiving population could only be expected after at least a generation has elapsed.

A similar approach which takes account of intra-cohort fertility differentials among migrants at the place of destination, is the adaptation hypothesis which assumes that the fertility patterns of migrants gradually adapt to the new economic, social, and cultural environments at place of destination, and therefore it is expected that eventually - as their exposure to the new settings increase - their fertility level will resemble or be equal to that of the receiving population.

Another possibility that has been tested is that migrants are a selected group. The selectivity hypothesis focuses on the known fact that migrants are not a random sample of the population at their place of origin in terms of age, education, and marital status among other characteristics, and that therefore they should be expected to possess fertility preferences different from those of the overall population at place of origin.

Finally, the fourth hypothesis that has been considered is that which deals with the effects on fertility due to migration itself. The disruption hypothesis suggests that by the mere fact of mobility, migrants become exposed to factors affecting both the 'tempo' and 'quantum' of their fertility. In this case, therefore, it is assumed that immediately after migration, migrants' fertility would be particularly low - especially due to temporary spousal separation - and that it will give way in turn, as time goes by, to the readoption of a more normal or even accelerated pace in their fertility pattern.

In relation to those hypotheses, as it was mentioned before (Section 1.1.1), the findings that have been reported for developing countries seem to suggest that while in South East Asia and perhaps in North Africa there is evidence of increasing positive-selectivity and disruption-effects in the relationship between migration and fertility, in the case of Latin America the results seem to indicate that one should expect to find strong 'place' effects in the fertility behaviour of migrants.

The basis for the assumption that the 'place' effects (i.e. those related with place of socialization and/or adaptation to current place of residence) should prevail in the fertility-migration relationship in Latin America, stem from two interrelated factors. On the one hand, it has been shown that most of the evidence presented in the reviewed studies points to a decreasing trend in the positive-selectivity of Latin American migrants (Browning & Feindt: 1969. Alberts:1977), which implies the increasing mobility of those with high fertility. At the same time, on the other hand, it has also being pointed out that even when the rural-urban fertility differential was relatively low, rural to urban migrants had higher fertility than non-migrant urban residents (Miro:1966. Brito:1969).

In the specific case of Mexico, therefore, if one assumes that at least during the last two decades, fertility differentials tended to increase between the rural and urban areas as a result of the earlier onset of fertility decline in the latter, and that about the same time the positive-selectivity of migrants started to decrease, one is led to suggest that the socialization and/or adaptation effects of migration upon fertility must have been present during the last 15 to 20 years or so.

4.2.- The Socialization and Adaptation Hypotheses.

Within the documented evidence related to the socialization and adaptation hypotheses, there are several findings that have what we consider to be relevant consequences for the purposes of operationalizing the tests for those hypotheses. These findings and their implications are the following:

i) For the socialization hypothesis, the experience in developed countries has been characterized by the increasing realization that the strength of the residential-background factor as a predictor of fertility behaviour, was confined only to those birth-cohorts of women who were exposed to two well differentiated patterns of reproductive behaviour between the urban and rural environments (Ritchey & Stokes: 1971. McGirr & Hirschman: 1979); therefore, we are contending that for our purposes a birth-cohort approach is the appropriate way to test this hypothesis.

ii) In relation to that same hypothesis, but in this case from the experience in a developing country, Browning & Feindt, (1968) concluded that whenever possible one should substitute the criteria of birth-place by place of formation (i.e. the area in which the individual receives its basic formal education and extra-familial formation) as a way for distinguishing between natives and migrants, since the latter seemed to be a better way of discriminating for socio-economic factors between and within each of those sub-groups of the population; therefore, we are resorting to a definition of 'socialization-environment' which refers to the area in which a woman spends her formative period up to the age of 12 years, and;

iii) For the adaptation hypothesis, one of the findings presented by Martine, (1975) was that along with time of exposure to the urban environment, a major factor in explaining migrants' fertility behaviour was that of the life-stage in which the migrants moved into the city - since most of those who arrived below some age cutting-point were single on arrival, while most of those who were above the cutting-point were already married on arrival - therefore, we use the Singulate Mean Age at Marriage as an approximate cutting-point to differentiate between migrants who arrived at their destination before or after the age at which childbearing exposure begins.

With those previous considerations in mind, we have set out to test the following propositions:

a) The socialization effect of migrants' fertility is present when, within a given birth-cohort, women who are migrants and spent their formative period in a rural community are more likely to have 'high' marital cumulative-fertility than those women who are natives and have spent their formative period in anurban setting;

b) Based on the combination of the decreasing selectivity of migrants and on the increasing differentials in the fertility behaviour between the populations of the urban and rural areas it is expected that, within the whole set of birth-cohorts, those who are the oldest amongst the rural to urban migrants would be less likely to have been affected by the socialization effect (as stated in 'a)'), than the younger birth-cohorts that also spend their formative period in a rural setting;

c) The adaptation effect of migrants' fertility is present when, within a given birth-cohort of migrant women, those who have experienced longer periods of exposure within the place of destination are more likely to have 'low' marital cumulative-fertility than those migrant women who have experienced shorter periods of exposure to the receiving socio-economic environment, and;

d) It is expected that within a given birth-cohort and at the same durations of exposure at the place of destination, migrant women who have arrived below the SMAM age would be more likely to have 'low' marital cumulative-fertility than those migrants who arrived at the new socio-economic environment at or above the SMAM age.

4.3.- The Technique and the Variables.

In order to test the set of propositions that have been stated above, we have used the same Log-linear modelling technique that has been described in Section 3.2.2. For the present purposes, however, alongside the analysis of the expected odds for the dependent variables' categories as a function of the independent variables, we will also be analyzing the significance level that the inclusion of the independent variables has on the capability of the Logit-model to explain the variation in the dependent variable's categories. That is to say, in other words, that we will be testing the effects of the independent variables upon the dependent variable, by measuring the statistical significance that is achieved when each of the independent variables are included in the appropriate models.

The measurements that we will be using for testing the significance of the effects of the independent variables are that of minus two times the logarithm of the ratio of the Likelihood Ratio (L^2) of the model which includes the additional independent variable to the corresponding value of the base model (i.e. the one whose goodness-of-fit we are seeking to improve by including an additional variable), and the absolute difference in the number of degrees of freedom between those two models. In combination those two measurements follow the chi-square (X^2) distribution function, and therefore allow one to identify the level of significance (alpha) that a given (X^2) value with (n) degrees of freedom (DF) can achieve.

The main difference between this model testing procedure and the one that we used in the previous chapter, is that in this case in addition to the agreement between observed and expected cell frequencies (i.e. goodness-of-fit of the model) as a criterion for model evaluation, we have also used the change in the Likelihood Ratio (L^2) as a means to obtain a precise and objective criteria for testing the statistical significance of each of the independent variables considered when testing the two relevant hypotheses (Knoke & Burke:1980;30).

In the models that we have fitted to test for the presence of the socialization and adaptation effects on the fertility behaviour of five birth-cohorts of the migrant population, we have included as dependent variable the total number of children ever born (CEBT) that a woman currently within union has had. For this variable we have defined two categories which were coded as '0' for 'low' parity and as '1' for 'high' parity, and the values of the number of CEBT which were included in each of those categories for each of the five birth-cohorts being considered were such that, those values below the one that contained the birth-cohort CEBT median were considered as 'low' parity, while those values which were at or above the value that contained the birth-cohort CEBT median were considered as 'high' parity[21].

Based on the same principle of distribution between categories of a variable mentioned above, both sets of models included as independent variables the educational attainment level of the woman (Ea), which was categorized as 'low' (coded as '0') or as 'high' (coded as '1') depending on the number of schooling years that a woman has achieved (i.e. 'low' if number of years of education below the cohort's mean, and 'high' if the number of years of education of the woman above

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21.- The only exception to this rule was for the model which tested the socialization effect for the 1952-61 birth-cohort, where the value of the median was included as 'Low' parity in order to achieve a sample distribution between parity categories as close to even as possible.

the cohort's mean number years of school attendance).

Additionally, the models that were fitted to test for the presence of the adaptation effect included as independent variables both, length of exposure to the receiving area (Lex) for which the categories of 'short' (coded as '0') 'medium' (coded as '1') and 'long' (coded as '2') were defined (i.e. each of the durations of exposure were set in relation to the woman's age and therefore, for instance, 10 years of exposure is a 'short' duration for the older cohorts; 'medium' length of exposure for the intermediate cohorts; and, 'long' period of exposure for the youngest cohorts: see, Table A.4.1 at the end of this chapter), and also that of age at arrival (Aa) which distinguishes between those women who arrived before or at the age of 20 (coded as '0'), from those who arrived after having achieved their 21st birthday (coded as '1'), since the migrant's group SMAM was 21.6 years in 1986[22].

Lastly, it should be mentioned that the models set up to test for the socialization effect also included as an independent variable the combination of the migratory status and residential-background (MSs), for which we defined the categories of 'migrant rural-socialized' (coded as '0') and 'native urban-socialized' (coded as '1'), in which area of socialization was defined as the type of place (urban-rural) in which the woman lived when she was age 12.

4.4.- The Models and the Results.

4.4.1.- The socialization effect models.

In order to test for the presence of the socialization effect on the fertility behaviour of the migrant rural-socialized women, we defined five birth-cohorts which

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22.- The exact values that the categories of the dependent and independent variables adopted in each of the two sets of models, for each of the five birth-cohorts, are presented in Table A.4.1 at the end of this section.

cover the fifty years period from 1922 to 1971. In every one of these cohorts we have included as means of comparison, both the native urban-socialized and the migrant rural-socialized groups, which on the whole defined the following sample size for each birth-cohort; 1922-31, n= 165; 1932-41, n= 226; 1942-51, n= 410; 1952-61, n= 567; and, 1962-71, n= 336.

For each of those birth-cohorts, we have fitted five Logit-models in which 'achieved-parity' (CEBT) was the dependent variable. The first model included only the direct effects of educational attainment (Ea) and of socialization environment (MSs) upon achieved parity. The two following models included only one direct effect (i.e educational attainment or socialization environment), and the two remaining models included the combination of one of the direct effects with the interaction of educational attainment and socialization environment, upon the reproductive behaviour of both groups included in the models. The goodness-of-fit statistics of the five models for each birth-cohort are presented in Table 4.4.1, and in the second panel of that table we have included the relevant results of the significance-level tests between models.

The first test that we have set is that of the direct effect of socialization-environment, and for that purpose the relevant comparison is between models number one and number two. In this test what is being considered is whether or not the addition of the independent variable of socialization-environment would improve the goodness-of-fit of the model, once the direct educational attainment effect has been controlled.

The results presented in the first three rows of the second panel of Table 4.4.1 indicate that, with one degree of freedom, all but the oldest cohort's (X^2) values are significant. For the youngest cohort the inclusion of the socialization- environment effect is significant at the 0.050 level;

TABLE 4.4.1
LOGIT MODELS FOR THE SOCIALIZATION EFFECT BY BIRTH-COHORT. GOODNESS-OF-FIT STATISTICS AND MODELS COMPARISONS (1986 BCDS).

	BIRTH-COHORT				
A.-MODELS EFFECTS AND STATISTICS:	1922-31 no= 165	1932-41 no= 226	1942-51 no= 410	1952-61 no= 567	1962-71 no= 336
1) EDUCATION & SOCIALIZATION DIRECT EFFECTS					
Likelihood R.	1.060	0.148	1.786	0.004	0.232
DF	1	1	1	1	1
P	0.303	0.701	0.181	0.949	0.630
2) EDUCATION DIRECT EFFECTS					
Likelihood R.	2.070	2.572	8.161	1.250	2.316
DF	2	2	2	2	2
P	0.355	0.276	0.017	0.535	0.314
3) SOCIALIZATION DIRECT EFFECTS					
Likelihood R.	10.263	13.834	20.876	26.991	19.206
DF	2	2	2	2	2
P	0.006	0.001	0.000	0.000	0.000
4) SOCIALIZATION AND INDIRECT					
Likelihood R.	0.178	3.210	16.066	26.707	17.189
DF	1	1	1	1	1
P	0.673	0.073	0.000	0.000	0.000
5) EDUCATION AND INDIRECT					
Likelihood R.	1.976	2.477	0.667	1.249	1.029
DF	1	1	1	1	1
P	0.160	0.115	0.414	0.264	0.310
B.- COMPARISON BETWEEN MODELS:					
ONE & TWO; DF	1	1	1	1	1
Chi-square	1.339	5.710	3.039	11.489	4.602
ALPHA	N.S.	0.025	0.100	0.005	0.050
ONE & THREE; DF	1	1	1	1	1
Chi-square	4.541	9.075	4.917	17.634	8.833
ALPHA	0.050	0.005	0.050	0.005	0.005
FIVE & TWO; DF	1	1	1	1	1
Chi-square	0.093	0.075	5.009	0.002	1.623
ALPHA	N.S.	N.S.	0.050	N.S.	N.S.
FOUR & THREE; DF	1	1	1	1	1
Chi-square	8.109	2.922	0.524	0.021	0.222
ALPHA	0.005	0.100	N.S.	N.S.	N.S.

Note: Chi-square = { -2Ln(LRa/LRb) }; DF = (\|DFa - DFb\|).

for the 1952-61 cohort it is significant at the 0.005 level; for the 1942-51 cohort the significance level is only 0.100, and; for the 1932-41 cohort the level of significance is 0.025.

The second test that we have set is that of the direct effect of educational attainment, and for that purpose the appropriate comparison is between models number one and number three. In this test, what is being considered is whether or not the inclusion of the independent variable of educational attainment would improve the goodness-of-fit of the model, once the direct socialization-environment effect has been controlled. In this case, the results presented in Table 4.4.1 indicate that for all five birth-cohorts' models the addition of educational attainment is significant at least at the 0.050 level.

Once the direct effects of socialization-environment and educational attainment have been tested, we can now set to test the significance of the inclusion of the interaction effects on the parity model of each cohort, by controlling the direct effects of one of the independent variables. For this purpose the relevant comparisons are those between models number five and number two, and between number four and number three.

The results of those two sets of tests, presented at the bottom of Table 4.4.1, allow one to see that the interaction effects between socialization-environment and educational attainment are significant only for the three eldest cohorts. In this case, while the indirect effects are significant at the 0.050 level for the 1942-51 birth-cohort only after controlling for the direct effects of educational attainment, the indirect effects are significant for the two oldest birth-cohorts only when the direct effects of socialization-environment have been controlled.

According to the whole set of tests, therefore, the highest changes in significance are achieved when one changes from model 2 to model 1 in the two youngest birth-cohorts and also in the 1932-41 cohort. In the case of the oldest cohort, however, the most significant change is achieved by shifting from model number 3 to number 4, and for the 1942-51 cohort the best model seem to be obtained when moving from model number 2 to model number 5. For all five birth-cohorts the goodness-of-fit statistics presented in the top panel of Table 4.4.1 seem to support this suggestion, since all the models that achieve the highest levels of significance are the ones with the lowest (L^2) to (DF) ratio and the highest statistical significance (P), within each of the corresponding sets of models for each birth-cohort.

Based on those results we have decided to compute the Conditional Odds values that can be obtained for the best-fit model of each birth-cohort, information which is presented in Table 4.4.2.

A first and major point to notice from the data in that Table, is that as expected from proposition 'a' (Section 4.2) all but one of the ten cohort-education categories of migrant women who spends their formative period in a rural community are more likely to achieve 'high' marital cumulative-fertility than those women in the same educational categories but who are natives and spend their formative period in a urban environment.

A second point to notice is that, within those nine categories, the conditional odds for the migrant rural-socialized women are at least 20.0 % higher than those of the native urban-socialized group, and that for all cohorts of both groups those women who have a 'low' level of educational attainment always have higher odds for 'high' parity that their intra-cohort counterparts which have attained a 'high' level of education.

The third and final point to notice from the data in Table 4.4.2 is that, leaving aside the youngest birth-cohort,

TABLE 4.4.2
COHORT-SPECIFIC CONDITIONAL ODDS FOR RURAL-SOCIALIZED MIGRANTS AND NATIVE URBAN-SOCIALIZED NP-MW TO ACHIEVE HIGH PARITY BY EDUCATIONAL ATTAINMENT (1986 BCDS).

BIRTH COHORT	EDUCATION LEVEL	ODDS FOR HIGH PARITY	
		MIGRANT RURAL-SOCZED	NATIVE URBAN-SOCZED
1971-1962			
	LOW	10.00	6.67
	HIGH	2.70	1.79
1961-1952			
	LOW	1.67	1.35
	HIGH	0.67	0.55
1951-1942			
	LOW	3.03	6.25
	HIGH	1.28	0.64
1941-1932			
	LOW	1.85	0.94
	HIGH	0.66	0.34
1931-1922			
	LOW	1.25	0.10
	HIGH	0.43	0.26

Source: Computed from the data presented at the end of this Section in Tables A.4.2 to A.4.6, respectively.

all but one of the categories with 'high' level of education of both natives and migrants have odds values under unity, values which indicate that most women in the population with 'high' educational attainment of the four oldest birth-cohorts are more likely to achieve 'low' rather than 'high' marital cumulative-fertility. This pattern of the effects of education, seems to suggest that for the older cohorts educational attainment usedto be a much stronger discriminant between 'high' and 'low' parity achievers and, at the same time, that the influence of this factor may have been reducing over time.

With the purpose of corroborating the set of patterns that were found when referring to the cohort-specific models for the test of the socialization-environment effect with a larger sample size, we have decided to fit an additional Logit-model which includes as a third independent variable; the age-group (AgG) of the women with five categories that were coded from '0' to '4' (i.e. from youngest to oldest cohort, respectively), and that correspond to each one of the five birth-cohorts previously defined.

In this case we have fitted the model that includes the direct effects of the three independent variables (i.e. educational attainment, socialization-environment, and age-group) upon the dependent variable of CEBT, and the interaction that takes into account the changing relationship between age-group and socialization-environment[23]. From the results of this model we have also computed the Conditional Odds for achieving 'high' parity - for the two educational-level categories in each of the five birth-cohorts included - for both the native urban-socialized and the migrant rural-socialized groups, information which is presented in Table 4.4.3.

In comparing the data in that table with that from the cohort-specific models (Table 4.4.2), a first point to notice is that now, as suggested in proposition 'a', there is no single exception to the expected pattern of conditional odds for the migrant rural-socialized group. The results of the all-cohorts model, in other words, allow us to see that regardless of birth-cohort all migrant women who spend their formative period in a rural environment are more likely to achieve 'high' marital cumulative-fertility than those women who are in the same birth-cohort but who are natives and spend their formative period in anurban setting.

A second point to notice about the data in Table

23.- The goodness-of-fit statistics for this model are; (L2) = 4.481, (DF) = 9, and (P) = 0.877.

4.4.3 is that, as in the cohort-specific models, in all cohorts of both groups those women with 'low' education level have higher odds to achieve 'high' parity levels than those women with 'high' educational attainment, and that when the youngest cohort is excluded the overwhelming majority of those women with a 'high' level of education have odds values below unity, which in turn indicates that they are more likely to be 'low' than 'high' parity achievers.

TABLE 4.4.3
CONDITIONAL ODDS FOR RURAL-SOCIALIZED MIGRANTS AND NATIVE URBAN-SOCIALIZED NP-MW TO ACHIEVE HIGH PARITY BY BIRTH-COHORT AND EDUCATIONAL ATTAINMENT, (1986 BCDS).

BIRTH COHORT	EDUCATION LEVEL	ODDS FOR HIGH PARITY	
		MIGRANT RURAL-SOCZED	NATIVE URBAN-SOCZED
1971-1962			
	LOW	8.18	5.16
	HIGH	3.00	1.90
1961-1952			
	LOW	1.72	1.44
	HIGH	0.63	0.53
1951-1942			
	LOW	3.41	1.83
	HIGH	1.25	0.67
1941-1932			
	LOW	1.83	0.93
	HIGH	0.67	0.34
1931-1922			
	LOW	1.21	0.63
	HIGH	0.45	0.23

Source: Computed from the data presented at the end of this Section in Table A.4.7.

The third and final difference to notice between the data from the cohort-specific and the all-cohorts models is that the data of the latter, seem to suggest that there is a pattern toward the reduction of the differences between the odds values of comparable educational level categories of the native urban-socialized and the migrant rural-socialized groups. In this case, the two youngest cohorts of natives have odds values that are less than 40.0 % smaller that those of their migrant counterparts, while the three oldest cohorts of natives have conditional odds values that on average represent half of those of the migrant rural-socialized women of those three birth-cohorts.

One possible question that emerges from that pattern in the odds values of the successive generations (which can be an artifact of the all-cohorts' model since it is more likely to generate results that would indicate stronger differences amongst groups, due to the larger sample-size that it involve which, in turn, increases the chances to identify those differences), is whether or not this pattern may be the result of a process of adaptation of the younger cohorts to the patterns of reproductive behaviour prevalent at the place of destination, an issue which we will be looking at in the following subsection.

4.4.2.- The adaptation effect models.

In order to test for the presence of the adaptation effect on the fertility behaviour of the migrant women, we have resorted to the same birth-cohorts that were defined in Subsection 4.4.1, and since these now include all migrant women regardless of current type of residence and of types of socialization-environment, the following sample sizes were achieved for each birth-cohort; 1922-31, n= 253; 1932-41, n= 441; 1942-51, n= 606; 1952-61, n= 775; and, 1962-71, n= 358.

For each of those five birth-cohorts we have fitted five Logit-models in which 'achieved parity' (CEBT) was the dependent variable. The first model included all three direct effects of the independent variables (i.e. educational attainment (Ea), length of exposure to the receiving area (Lex), and age at arrival at destination (Aa)) upon achieved parity.

The three following models were defined by the inclusion of only two out of the three direct effects from the independent variables, and the last model included only the direct effect of educational attainment level upon the reproductive behaviour of each of the birth-cohorts being considered. The goodness-of-fit statistics of the five models for each birth-cohort are presented in Table 4.4.4, and in the second panel of that same Table we have included the relevant results of the significance-level tests between models.

The first test that we have set is that of the direct effect of length of exposure to the receiving area, and for that purpose the initial relevant comparison is between models number one and number two. In this test what is being considered is whether or not the addition of the independent variable of the number of years of exposure would improve the goodness-of-fit of the model, once the direct effects of educational attainment and age at arrival have been controlled[24].

The results presented in the first three rows of the second panel in Table 4.4.4 indicate that, with two degrees of freedom, none of the cohorts' (X^2) values are significant at or below the 0.100 significance level. These results, in other words, suggest that the length of exposure variable does not help significantly in explaining the distribution between 'low' and 'high' parity achievers amongst the migrant women of the five birth-cohorts, once the educational attainment levels and the age at arrival have been taken into account.

The second test that we have set is that which focuses on the effect of age at arrival of migrants upon their fertility, and for that purpose the initial appropriate

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24.- It should be noticed that in spite of the expected high negative correlation between 'years of exposure' and 'age at arrival', we have decided to keep both variables in the model since the latter is being used as a crude proxy for 'marital-status on arrival'.

TABLE 4.4.4
COHORT-SPECIFIC LOGIT MODELS FOR THE ADAPTATION EFFECT. GOODNESS-OF-FIT STATISTICS AND MODELS COMPARISONS (1986 BCDS).

A.-MODELS EFFECTS AND STATISTICS:	BIRTH-COHORT				
	1922-31 no= 253	1932-41 no= 441	1942-51 no= 606	1952-61 no= 775	1962-71 no= 358
1) EDUCATION, LENGTH OF EXP.& AGE AT ARRIVAL					
Likelihood R.	0.127	3.259	5.755	7.194	7.438
DF	3	3	5	7	3
P	0.988	0.353	0.331	0.409	0.059
2)EDUCATION & AGE AT ARRIVAL					
Likelihood R.	0.367	4.247	5.889	23.501	14.692
DF	5	5	7	9	5
P	0.996	0.514	0.553	0.005	0.012
3)EDUCATION & LENGTH OF EXP.					
Likelihood R.	0.385	6.174	5.772	11.779	8.270
DF	4	4	6	8	4
P	0.984	0.187	0.449	0.161	0.082
4)AGE AT ARVL.& LENGTH OF EXP.					
Likelihood R.	8.966	27.657	31.310	60.059	16.055
DF	4	4	6	8	4
P	0.062	0.000	0.000	0.000	0.003
5)EDUCATION DIRECT EFFECTS					
Likelihood R.	0.947	7.027	5.893	25.251	14.779
DF	6	6	8	10	6
P	0.988	0.318	0.659	0.005	0.022
B.- COMPARISON BETWEEN MODELS:					
ONE & TWO; DF	2	2	2	2	2
Chi-square	2.122	0.530	0.046	2.368	1.361
ALPHA	N.S.	N.S.	N.S.	N.S.	N.S.
ONE & THREE; DF	1	1	1	1	1
Chi-square	2.218	1.278	0.006	0.986	0.212
ALPHA	N.S.	N.S.	N.S.	N.S.	N.S.
ONE & FOUR; DF	1	1	1	1	1
Chi-square	8.514	4.277	3.388	4.244	1.539
ALPHA	0.005	0.050	0.100	0.050	N.S.
TWO & FIVE; DF	1	1	1	1	1
Chi-square	1.896	1.007	0.001	0.144	0.012
ALPHA	N.S.	N.S.	N.S.	N.S.	N.S.
THREE & FIVE;DF	2	2	2	2	2
Chi-square	1.800	0.259	0.041	1.525	1.161
ALPHA	N.S.	N.S.	N.S.	N.S.	N.S.

Note: Chi-square = { -2Ln(LRa/LRb) }; DF = (|DFa - DFb|).

comparison is between models number one and number three. In this case what is being analyzed is whether or not the inclusion of the age at arrival variable would improve the goodness-of-fit of the model, once the direct effects of educational attainment and length of exposure to the new settings have been controlled.

As in the previous case, the results of the comparison between models number one and number three, which are presented in the second panel of Table 4.4.4, indicate that - with one degree of freedom - none of the five birth-cohorts' (X^2) values are significant at or below the 0.100 significance level. Here, again, the test's results seem to suggest that the inclusion of the age at arrival variable does not help in explaining the distribution between 'low' and 'high' parity achievers amongst the migrant women, once their educational attainment levels and their years of exposure to the receiving area have been allowed for.

The third test that we have set is that in which the convenient comparison is between models number one and number four, since its purpose is to observe whether or not the inclusion of the direct effect of educational attainment upon the reproductive behaviour of the migrant population increases the goodness-of-fit of the 'achieved parity' models of each of the five birth-cohorts, once the direct effects of length of exposure to the receiving area and age at arrival to the new settings have been controlled.

Contrary to the results of the two previous tests, the data in the three middle rows of the second panel of Table 4.4.4 allow one to see that, with one degree of freedom, all but the youngest cohorts' (X^2) values are significant at or below the 0.100 significance level. These results, therefore, indicate that once length of exposure and age at arrival to the receiving area have been taken into account, the inclusion of the educational attainment variable helps significantly in explaining the distribution of the migrant women between 'low' and 'high' parity achievers, at least in four out of the five birth-cohorts that have been included.

Taking into consideration the results of the educational attainment effect, we have devised two additional comparisons in which - by means of controlling for the effects of education - we will perform a further test of the effects of length of exposure and of age at arrival to the receiving area. In the case of the latter effect the appropriate comparison is between models number two and number five, and the test of the length of exposure effect involves the comparison between models number three and number five.

The results of these two comparisons - which are presented in the six bottom rows of Table 4.4.4 - allow one to see that without a single exception, once the direct effects of educational attainment have been controlled, all ten (X^2) values are not significant at or below the 0.100 significance level of their corresponding number of degrees of freedom. These two sets of tests, therefore, seem to suggest that neither the inclusion of length of exposure nor that of age at arrival to the receiving area as independent variables in the Logit-models of the five birth-cohorts, improves the model's capability to explain the migrants' women distribution between 'low' and 'high' parity achievers, once the effects of education attainment have been controlled.

4.5.- Discussion.

The central aim of this section has been to empirically test, with the data from the 1986 BCDS, the relevant demographic hypotheses concerning the relationship between migration and fertility.

Based on the reported previous findings for that relationship from Latin America, and on the interrelated trends of increased differentiation between the reproductive behaviour of the urban and rural population and of the decreasing positive-selectivity of Mexico's internal migrants, we have suggested that the relevant hypotheses to analyze the relationship between migration and fertility in the case of Baja California are those which take into account the socialization and adaptation effects on migrants' fertility.

The four propositions that we have set out to test, therefore, have been that; (a) the socialization effect could be considered as present if the migrant rural-socialized group of women were more likely to achieve 'high' marital cumulative-fertility than the native urban-socialized group; (b) that it was expected that amongst the migrant rural-socialized group, the older the birth-cohort the less likely that they would have been affected by the socialization effect; (c) that the adaptation effect could be considered as present if within a birth-cohort of the migrant group, those women with longer periods of exposure to the receiving area were more likely to have 'low' marital cumulative-fertility than their intra-cohorts counterparts with shorter periods of exposure, and; (d) that within a given migrant's birth-cohort and at the same lengths of exposure, it was expected that those women who arrived before the SMAM would be more likely to have 'low' marital cumulative-fertility than those intra-cohorts counterparts who arrived at or above the migrants' SMAM.

The results that we have obtained by measuring the statistical significance of the inclusion of the socialization and adaptation effects - by means of the Logit-modelling technique - when trying to explain the reproductive behaviour of the migrant population allow us to contend, at least from our perspective, the following conclusions:

i) The lack of significance in all ten models that tested the length of exposure factor of the adaptation effect of migrants' fertility seem to suggest, in the case of the migrants to Baja California, that after controlling for education there is no evidence to support our proposition that within a given birth-cohort of migrants those with longer periods of exposure would be more likely to have 'low' marital cumulative-fertility than their intra-cohort counterparts who have experienced shorter periods of exposure to the new socio-economic environment;

ii) That the consistent absence of significance that was evident in all ten models that tested the age at arrival factor of the adaptation effect of migrants' fertility also seem to suggest that, for migrants into Baja California and after controlling for education, there is no evidence to support our proposition that at similar durations of exposure and within a given birth-cohort of migrant women those who arrive below the SMAM would be more likely to have 'low' marital cumulative-fertility than their intra-cohort counterparts who arrived to the new settings at or after achieving the SMAM;

iii) It is most likely that the intra-cohort differentials between 'low' and 'high' parity achievers of the migrant population of Baja California, if any, may be related to intra-cohort educational attainment differences, since all but the youngest cohort's models were significantly improved when the direct effects of education were taken into account, and since it is likely that for the youngest generation an indirect effect between education attainment and age at arrival at the place of destination could have removed this exception to the education effects test;

iv) The significance levels for the test of the socialization-environment effect in four of the five cohorts, and the direction and consistency of the differences of the conditional odds to achieve 'high' parity between the native urban-socialized and the migrant rural-socialized groups of Baja California - from both the cohort-specific and the all-cohorts models - seem to provide substantive evidence that supports our proposition that after controlling education those women who are migrant and have spent their formative period in a rural community are more likely to have 'high' marital cumulative-fertility than the native urban-socialized group, and;

v) Based on the fact that the only exception to the significance test of the direct socialization-environment effect was that of the oldest birth-cohort, and also on the results that indicate that the indirect effects between socialization-environment and educational attainment were significant only for the three eldest cohorts, we would like to suggest that there is at least partial evidence to support our proposition that the older birth-cohorts of Baja California's migrants, were less likely to be affected by the socialization-environment effect of migration upon fertility.

TABLE A.4.1
BIRTH-COHORT SPECIFIC VALUES FOR VARIABLES INCLUDED IN THE LOGIT MODELS FOR THE SOCIALIZATION AND ADAPTATION EFFECTS, (1986 BCDS DATA).

	BIRTH-COHORT VALUES				
SOCIALIZATION EFFECT MODELS, VARIABLES & CATEGORIES:	1922-31	1932-41	1942-51	1952-61	1962-71
-CHILDREN EVER BORN TOTAL;					
'LOW' PARITY	< 8	< 7	< 4	< 3	< 1
'HIGH' PARITY	>= 8	>= 7	>= 4	>= 3	>= 1
-EDUCATIONAL ATTAINMENT;					
'LOW' LEVEL	<= 3	<= 5	<= 6	<= 10	<= 10
'HIGH' LEVEL	> 3	> 5	> 6	> 10	> 10
ADAPTATION EFFECT MODELS, VARIABLES & CATEGORIES:					
-CHILDREN EVER BORN TOTAL;					
'LOW' PARITY	< 7	< 7	< 4	< 3	< 1
'HIGH' PARITY	>= 7	>= 7	>= 4	>= 3	>= 1
-EDUCATIONAL ATTAINMENT;					
'LOW' LEVEL	<= 3	<= 4	<= 6	<= 6	<= 9
'HIGH' LEVEL	> 3	> 4	> 6	> 6	> 9
-LENGTH OF EXPOSURE (YEARS);					
'SHORT'	<= 15	<= 10	<= 5	<= 5	<= 5
'MEDIUM'	16-25	11-20	6-15	6-10	6-10
'LONG'	> 25	> 20	> 15	> 10	> 10

TABLE A.4.2
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY; BIRTH-COHORT 1962-71. (1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	-0.721809
$CEBT_{(1)}$	0.721809
$CEBT_{(0)}MSs_{(0)}$	-0.102837
$CEBT_{(0)}MSs_{(1)}$	0.102837
$CEBT_{(1)}MSs_{(0)}$	0.102837
$CEBT_{(1)}MSs_{(1)}$	-0.102837
$CEBT_{(0)}Ea_{(0)}$	-0.326961
$CEBT_{(0)}Ea_{(1)}$	0.326961
$CEBT_{(1)}Ea_{(0)}$	0.326961
$CEBT_{(1)}Ea_{(1)}$	-0.326961

TABLE A.4.3
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY; BIRTH-COHORT 1952-61. (1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	0.023235
$CEBT_{(1)}$	-0.023235
$CEBT_{(0)}MSs_{(0)}$	-0.049278
$CEBT_{(0)}MSs_{(1)}$	0.049278
$CEBT_{(1)}MSs_{(0)}$	0.049278
$CEBT_{(1)}MSs_{(1)}$	-0.049278
$CEBT_{(0)}Ea_{(0)}$	-0.225779
$CEBT_{(0)}Ea_{(1)}$	0.225779
$CEBT_{(1)}Ea_{(0)}$	0.225779
$CEBT_{(1)}Ea_{(1)}$	-0.225779

TABLE A.4.4
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY; BIRTH-COHORT 1942-51.
(1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	-0.340487
$CEBT_{(1)}$	0.340487
$CEBT_{(0)}MSs_{(0)}$	-0.387904
$CEBT_{(0)}MSs_{(1)}$	0.387904
$CEBT_{(1)}MSs_{(0)}$	0.387904
$CEBT_{(1)}MSs_{(1)}$	-0.387904
$CEBT_{(0)}MSs_{(0)}Ea_{(0)}$	0.175065
$CEBT_{(0)}MSs_{(0)}Ea_{(1)}$	-0.175065
$CEBT_{(0)}MSs_{(1)}Ea_{(0)}$	-0.175065
$CEBT_{(0)}MSs_{(1)}Ea_{(1)}$	0.175065
$CEBT_{(1)}MSs_{(0)}Ea_{(0)}$	-0.175065
$CEBT_{(1)}MSs_{(0)}Ea_{(1)}$	0.175065
$CEBT_{(1)}MSs_{(1)}Ea_{(0)}$	0.175065
$CEBT_{(1)}MSs_{(1)}Ea_{(1)}$	-0.175065

TABLE A.4.5
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY; BIRTH-COHORT 1932-41.
(1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	0.114804
$CEBT_{(1)}$	-0.114804
$CEBT_{(0)}MSs_{(0)}$	-0.167654
$CEBT_{(0)}MSs_{(1)}$	0.167654
$CEBT_{(1)}MSs_{(0)}$	0.167654
$CEBT_{(1)}MSs_{(1)}$	-0.167654
$CEBT_{(0)}Ea_{(0)}$	-0.255462
$CEBT_{(0)}Ea_{(1)}$	0.255462
$CEBT_{(1)}Ea_{(0)}$	0.255462
$CEBT_{(1)}Ea_{(1)}$	-0.255462

TABLE A.4.6
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY; BIRTH-COHORT 1922-31. (1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	0.543761
$CEBT_{(1)}$	-0.543761
$CEBT_{(0)}MSs_{(0)}$	-0.389168
$CEBT_{(0)}MSs_{(1)}$	0.389168
$CEBT_{(1)}MSs_{(0)}$	0.389168
$CEBT_{(1)}MSs_{(1)}$	-0.389168
$CEBT_{(0)}MSs_{(0)}Ea_{(0)}$	-0.265408
$CEBT_{(0)}MSs_{(0)}Ea_{(1)}$	0.265408
$CEBT_{(0)}MSs_{(1)}Ea_{(0)}$	0.265408
$CEBT_{(0)}MSs_{(1)}Ea_{(1)}$	-0.265408
$CEBT_{(1)}MSs_{(0)}Ea_{(0)}$	0.265408
$CEBT_{(1)}MSs_{(0)}Ea_{(1)}$	-0.265408
$CEBT_{(1)}MSs_{(1)}Ea_{(0)}$	-0.265408
$CEBT_{(1)}MSs_{(1)}Ea_{(1)}$	0.265408

TABLE A.4.7
VARIABLES, EFFECTS AND PARAMETERS FOR THE SELECTED LOGIT MODEL OF ACHIEVED PARITY FOR ALL BIRTH-COHORTS.
(1986 BCDS)

ACHIEVED PARITY	
Variables & Effects	Parameters (Lambda)
$CEBT_{(0)}$	-0.086852
$CEBT_{(1)}$	0.086852
$CEBT_{(0)}AgG_{(0)}$	-0.598363
$CEBT_{(0)}AgG_{(1)}$	0.109810
$CEBT_{(0)}AgG_{(2)}$	-0.120430
$CEBT_{(0)}AgG_{(3)}$	0.202727
$CEBT_{(0)}AgG_{(4)}$	0.406256
$CEBT_{(1)}AgG_{(0)}$	0.598363
$CEBT_{(1)}AgG_{(1)}$	-0.109810
$CEBT_{(1)}AgG_{(2)}$	0.120430
$CEBT_{(1)}AgG_{(3)}$	-0.202727
$CEBT_{(1)}AgG_{(4)}$	-0.406256
$CEBT_{(0)}MSs_{(0)}$	-0.130079
$CEBT_{(0)}MSs_{(1)}$	0.130079
$CEBT_{(1)}MSs_{(0)}$	0.130079
$CEBT_{(1)}MSs_{(1)}$	-0.130079
$CEBT_{(0)}Ea_{(0)}$	-0.250250
$CEBT_{(0)}Ea_{(1)}$	0.250250
$CEBT_{(1)}Ea_{(0)}$	0.250250
$CEBT_{(1)}Ea_{(1)}$	-0.250250
$CEBT_{(1)}AgG_{(0)}MSs_{(0)}$	-0.014911
$CEBT_{(1)}AgG_{(1)}MSs_{(0)}$	-0.085291
$CEBT_{(1)}AgG_{(2)}MSs_{(0)}$	0.025862
$CEBT_{(1)}AgG_{(3)}MSs_{(0)}$	0.038642
$CEBT_{(1)}AgG_{(4)}MSs_{(0)}$	0.035699
$CEBT_{(1)}AgG_{(0)}MSs_{(1)}$	0.014911
$CEBT_{(1)}AgG_{(1)}MSs_{(1)}$	0.085291
$CEBT_{(1)}AgG_{(2)}MSs_{(1)}$	-0.025862
$CEBT_{(1)}AgG_{(3)}MSs_{(1)}$	-0.038642
$CEBT_{(1)}AgG_{(4)}MSs_{(1)}$	-0.035699

V.- CONCLUSIONS.

5.1.- Summary of Findings.

From a demographic point of view the key question posited by the relationship between migration and fertility is whether there is a differential reproductive pattern between territorially mobile and non-mobile populations, and if there is such differential, which demographic factors may explain it? Based on that premise, and on the fact that the state of Baja California has been one of the major destination points for a substantial amount of the internal population movements within Mexico, the basic general objective of this thesis has been that of assessing the reproductive patterns of both the native and migrant population of the state of Baja California, in order to establish whether or not there are significant fertility-behaviour differences between those two sub-groups of the state's population, and if there are such differences to identify the likely demographic implications for the state.

In trying to achieve this general objective - which would also allow us to throw some light on the general issues of fertility differentials amongst groups of a population; the fertility-migration relationship; and, the broader topic of migration theory - it has been our contention that both the analytical framework and the aggregated version of the Proximate Determinants of Fertility model are the appropriate methodological-tools, given that the framework and that version of the model were devised as means for the purpose of comparing the reproductive behaviour of two populations which are expected to be responding in a differentiated manner to the social and economic context and, additionally, that the empirical experience with the four major hypotheses regarding the relationship between migration and fertility indicates that the underlying factors that explain the differences between migrants and non-migrants are those which the Proximate Determinants of Fertility model accounts for.

For the specific case of Baja California, the suggested approach has allowed us to demonstrate using the 1986 BCDS that the native population had current fertility levels which were 21.0% lower than inmigrants (i.e. TLFR; inmigrants 2.94, and natives 2.43). Also, furthermore, that the observed differences in reproductive performance of those two groups can be mainly explained by two distinctive sets of patterns of marriage, contraceptive use, and proportions and duration of breast-feeding.

In the case of the patterns of marriage, for instance, it was observed that the proportional loss of exposure (i.e. the complement of the values of the index of marriage in the Proximate Determinants model) was higher for the native group than that of the inmigrants (Cm 0.550 for native, and 0.638 for migrants), mainly due to the fact that in all but the two oldest age-groups the native population had lower proportions of women within union, and also had a lower female SMAM than the inmigrant group (i.e. FSMAM; natives 24.3, and inmigrants 21.6; see, Section 3.1.2). The combination of those factors, indicated that in the case of the native population the potential contribution of union dissolution (divorce, separation, and widowhood) and/or spousal separation to loss of exposure might be relatively weak, at least when compared with the marriage patterns of the inmigrant population.

Likewise, the analysis of the contraceptive practice in these two populations through the index of contraception in the Proximate Determinants model, allows us to demonstrate firstly that the proportion of native non-pregnant women of reproductive ages using contraception was higher than that of the inmigrant group; secondly, that although the use-effectiveness level is high and similar for both groups (i.e. just under 0.90), the 'mixture' of contraceptive methods by proportions of users is sharply different between those groups (presumably because either the 'older' age-structure of the migrant group or/and their higher levels of achieved parity leads them to a higher degree of use of non-reversible methods), since the natives' order of preferred methods is headed by contraceptive pills, followed by female sterilization, and IUDs, while that of migrants is more concentrated on female sterilization (i.e. 35.0% of inmigrant users against 23.6% in the case of natives), followed by the use of pills, and IUDs, and; thirdly, that the proportion of the native contraceptive users either matched or out-scored that of inmigrants in the five age-groups within the age range 15 to 39. Jointly, these three factors accounted for the higher fertility-inhibiting effect of contraception for natives than for migrants (Cc 0.343 for natives, and 0.403 for inmigrants).

The third and last component included in our implementation of the Proximate Determinants model, the index of post-partum infecundability (which is highly determined by the practice and duration of breast-feeding) also allows us to observe clear differences between natives and inmigrants in the proportion of women who breast-fed, and amongst the latter in the duration of breast-feeding. In this case both the proportion of women who breast-fed their last live birth, and the duration of the breast-feeding period were lower for the native group than those of the inmigrant population (i.e 51.1% of natives breast-fed with a mean duration 3.8 months, while 56.7% of inmigrants practised breast-feeding with a mean duration of 5.7 months), and therefore the fertility reducing effect of this factor was higher for the inmigrant group than for the native population (Ci 0.934 for natives, and 0.903 for migrants).

These three sets of reproductive patterns, on the whole, depict a more 'modernized' behaviour of the native group than that of the inmigrant population, since in the former (when compared to migrants) women marry later and in lower proportions; once within marriage, they practice contraception in higher proportions, and; they breast-feed in lower proportions and for shorter durations.

Having demonstrated that there are clear differences in the reproductive behaviour of the inmigrant and native groups, and once we had identified how the demographic mechanisms that lie behind those differences were affecting the group's reproductive patterns, we set out a decomposition of the proportional contribution of each of the three indices to the differences in the fertility levels (TLFRs) between the native and inmigrant groups. This procedure, allows us to establish that factors affecting both the effective reproductive span and the birth-length interval are responsible for the differences, since the decomposition indicated the predominance and almost equally shared influence of the indices of contraception and marriage in explaining the differences in patterns of reproductive behaviour between natives and migrants (Section 3.1.3).

Once we had analyzed and established the ranking of the demographic mechanisms that explain the differences in the reproductive behaviour of the native and inmigrant groups, a set of three Logit models was defined in order to ascertain which socio- economic and cultural factors can be associated with those 'levers' (i.e. the patterns of marriage, contraceptive use, and post-partum infecundability) that explain the differences between the fertility behaviour of migrants and natives, and to identify the direction and strength of the effects of specific socio-economic characteristics upon the relevant demographic mechanisms.

From this set of analyses our two general and main findings were, firstly, that even after controlling for the available demographic and socio-economic factors, the native and migrant groups show two well differentiated patterns of behaviour since - for all the categories considered - migrants are more likely than natives to be within union; to have lower proportions using contraception, both for first-birth delay and/or birth-spacing, and for childbearing stopping purposes, and; to breast-feed their children for longer periods.

The second finding was that the two models that took into account the 'type of place of residence' effects (i.e. current residence in the marriage model, and residence at age 12 in the contraception model), allowed us to show evidence of a hierarchical ordering that depicts a native-urban to migrant-rural 'continuum' in terms of a range of differentiated marriage and contraception patterns of behaviour between those four sub-groups.

Based on that latter finding, and also on the documented evidence previously reported in the literature review, we decided to empirically test - with the data from the 1986 BCDS - the two relevant demographic hypotheses regarding the relationship between migration and fertility for the case of Baja California; i.e. those which take into account the socialization and adaptation effects on migrants' fertility.

The results that we obtained from these tests - by means of the Logit modelling technique - when trying to explain the cumulated reproductive behaviour of the migrant population, allow us to demonstrate firstly, that after controlling for education, there is no evidence that within a given birth-cohort, migrants with longer periods of exposure are more likely to have 'low' marital cumulative-fertility than women of the same age who had a shorter period of exposure in the new socio-economic environment.

And, finally, that the results seemed to provide substantive evidence to support our proposition that after controlling education and regardless of birth-cohort, those women who are migrant and have spent their formative period in a rural community, are more likely to achieve 'high' marital cumulative-fertility than the native urban-socialized women in the same birth-cohort who spent their formative period in a urban setting.

5.2.- Implications.

5.2.1.- Theoretical.

The two last findings mentioned in the preceding section clearly indicate that in the case of the inmigrants to Baja California, there is no evidence to posit that they are going through a process of adaptation to the reproductive patterns of the native population of the receiving area, and also that they seem to be behaving according to the 'reproductive norms' acquired in their rural-socialization environment.

These results, from a strictly demographic point of view, seem to suggest that the direct or 'compositional' effects of the process of inmigration into Baja California will have not only short-term but also long-term effects on the state's population structure and on its dynamics, and we will be addressing this issue in Subsection 5.2.3 below.

At the same time, however, those findings require interpretation both from the broader socio-demographic perspective of the relationship between social structure and migration, and from the general viewpoint of migration theory. In the case of the first level of analysis, the question to be answered is that of which are the foreseeable long-term demographic impacts of this population movement for Mexico's demographic processes as a whole?

From the perspective of the 'change and demographic responses' theory (or theory of 'multhiphasic demographic responses') which, briefly stated, postulates that in the process of the transition to low and controlled population growth, populations respond in a variety of ways and with every means to population pressure and relative socio-economic deprivation - including among these responses the range of intermediate variables and both internal and external migration, and that the latter ones should be considered as substitutes for those which involve behavioural changes in the patterns of marriage or marital fertility[25] - our findings, at face value, could be interpreted as an indication that in Mexico internal migration has been acting as a 'safety-valve' that relieves population pressure in the out-migration areas, and that therefore this in turn would result in a delay of fertility change in the migrants' place of origin.

Such line of possible interpretation of our findings, however, could be hardly sustained on the face of the documented demographic changes that the rural areas (i.e. out-migration areas) of Mexico have undergone during the last 20 to 25 years. In this regard the latest available information at the national level indicates that - although the level of fertility still remained high during the first half of the 1980s (i.e. TFR 6.2), and that the pace of change has been slower than that observed in the urban areas of Mexico - the rural population of the country has reduced their fertility level by 25.0% in relation to the level prevailing during the mid and late 1960s (SSA & DHS:1989;38).

This same source of information, on the other hand, allow us to observe that when compared to the TFRs prevalent in several of the main origin areas during a similar time-period to that of our main data source (i.e. around 1985), Baja California inmigrant population's TFR was remarkably lower. In the case of the Region 4 (see Figure 2.1.1) for instance which, as it was pointed out in Subsection 2.3.2 has been the source of at least 20.0% of the female inmigrants into Baja California even during the early 1980s (see, Table 2.3.5) the TFR was 4.9 children, while that of the inmigrants in Baja California was at a level of 3.26 (Ibid;37. & Section 3.1).

Those noticeably different levels of fertility

25.- See, Davis (1963), Friedlander (1969 & 1983), and Mosher (1980) for the original formulation, extension, and actual application of this theoretical approach to a developing country's demographic transition, respectively.

between the inmigrant population of Baja California and those prevailing on some of the main areas of origin, strongly suggest that the former group is positively selected in relation to the population of origin, and/or that it is a group which is undergoing a process of rapid adoption of low-reproduction norms.

The former option seems to be supported by the previous reported findings which indicate that in the case of Mexico the selectivity of migrants have been changing over time (Juarez:1988), and we will be addressing this issue below.

Meanwhile if the latter possibility is further considered, our findings could be much more in line with the sociologically grounded framework which examines the linkages between migration and social structure focusing on the processes of 'structural differentiation' (Findley:1987. Goldscheider: 1989). This theoretical perspective is based on a multi-level contextual approach to the relationship between migration and social and economic settings, where community, household/family, and individual characteristics define three basic levels of effects and possible interactions (See, Findley:1987;19-87), that in turn seek to explain place-to-place variations in migration rates, the changing relation between social class and migration among communities, and the differentiated migration strategies that groups and individuals adopt in similar environments.

From this theoretical approach, which has been mainly used to analyze differentiated patterns of mobility within out-migration areas, our findings of lack of adaptation to the reproductive norms of the receiving area but within a process of change toward lower reproductive patterns than those prevailing in the origin areas, can be considered as one of the possible demographic outcomes of the process of migration. That is to say that, as it has been suggested that community, reference group, and individual characteristics can generate different patterns of mobility, our contention is that amongst those who move that same set of elements can induce a range of differentiated reproductive patterns.

In the case of Mexico, for instance, that range of possible demographic outcomes for migrants has been documented by Brambila (1985). In his study of migration and family formation in Mexico, Brambila (1985) has termed 'transitional group' those migrant women who "show a higher level of fertility and a lower age at marriage than the urban population (i.e. area of destination), but lower levels than the population that stays in the places of origin (i.e. rural areas)... In this case, the migrant population represents a transitional group which contributes to the decline in the national levels of fertility, but that also increase significantly the observed fertility in the urban areas" (O.T. Ibid;22-57).

In that same study, furthermore, Brambila (1985) also demonstrated that the geographical destination of the migrant's movement within Mexico generates rather differentiated reproductive outcomes. In this regard when fitting simple regression models for age at marriage and cumulated fertility (i.e. CEB) to the Mexican WFS data, he found that "while the migration toward Northern and central regions of the country have a positive effect in the age at marriage...the effect is negative amongst rural-destination migrants.....(and that)... ...This regional destination differentials can be also observed in the fertility model.. (which show that)..rural inmigrants have a significantly higher fertility than migrants to other areas" (O.T. Ibid;85).

That set of findings, as well as the type of factors that have been found to explain those differentiated patterns of reproductive behaviour (i.e. levels of urbanization at areas of destination, the relationship between life-cycle events of woman and migration, and the patterns of birth-state endogamic marriage, among others. Brambila:1985) when the information allow for comparison between stayers, migrants, and amongst the latter by place of destination, seem to provide support for the suggestion that our findings can be better accommodated within the multi-level contextual approach to the relationship between migration and socioeconomic settings proposed by the 'structural differentiation' framework, once the focus of analysis shifts from the causes to the demographic consequences of migration.

The demographic consequences that our findings have shown, on the other hand, should also be interpreted from the wider perspective of migration theory. In this case it should be noticed that, based on a definition of migrant which only differs from that of Lee (1966) in that we have excluded intra-city movements as migration while he did not, our study and its results seems to provide support for several of the general hypotheses that Lee derived from his theoretical approach to migration (based on the analytical framework integrated by factors associated with place of origin and destination, intervening obstacles, and personal factors of migrants) in regard to the volume of migration, and the characteristics of migrants (Ibid;49-52).

In relation to the volume of migration, for instance, three of Lee's hypotheses suggested that "within a given territory..(the volume of migration)..varies with the degree of diversity of areas included in that territory....that the volume of migration is related to the difficulty of surmounting the intervening obstacles...(and that the volume of migration tends to increase over time due to the)...increasing diversity of areas ...and the diminution of intervening obstacles" (Ibid;52-53). In this regard, as it was mentioned in Sections 2.2.1 & 2.3.1, it should be noticed that during the 20th century Baja California has evolved from being an almost 'empty' area to a main population-attraction zone due to factors (among others) such as the increasing differentials in living standards between the state and most of the other areas of Mexico; the construction of rail-road links that helped overcoming one of the most prominent intervening obstacles in the migration flow toward the state (i.e. distance); and, the recent development of a growing manufacturing industry that has created increasing employment opportunities, within a national context characterized by the 'austerity' and 'structural-adjustment' official economic policies (i.e. recession and unemployment), all of which seem to have influenced the changing volume of migration to Baja California.

The second set of Lee's hypotheses which are related to our findings are those concerned with the characteristics of migrants. For this topic Lee suggested, amongst other generalizations, that "migration is selective.. (i.e.).. ..migrants are not a random sample of the population at origin..;..migrants responding primarily to plus....... (attraction)..factors at destination tend to be positively selected..(and, that)..the characteristics of migrants tend to be intermediate between the characteristics of the population at origin and the population at destination" (Ibid;56-57).

The fact that our findings suggest that the fertility of Baja California inmigrants is intermediate between that of non-migrants at place of origin and that of natives at place of destination, seem to indicate that - at least in the case of inmigrants to the state - there is an ongoing process of change in the nature of the selectivity of migrants, by means of which migrants moving into Baja California seem to be getting increasingly positively selected amongst the population of origin. One of the factors that may be operating in this changing pattern of selectivity, could be that implicit in Lee's suggestion that migrants responding primarily and increasingly to attraction factors at destination, tend to be increasingly positively selected.

In this case we contend, therefore, that our findings support Lee's hypothesis that the characteristics of migrants (in our study; reproductive behaviour in general, and fertility in particular) tend to be intermediate between those of the population at origin and those of the population at destination. At the same time, however, this finding also seems to suggest that the selectivity of migrants has been changing over time in the case of the inmigrants to Baja California, and that they seem to be increasingly positively selected.

5.2.2.- Methodological.

From the perspective of the analytical approaches that have been used in the research related to the migration-fertility relationship, perhaps the major contribution of this study has been that of suggesting - and illustrating with the case of Baja California - that the 'Intermediate Fertility Variables' framework and the Bongaarts' 'Proximate Determinants' model offer the required assessment tools for comparing the reproductive behaviour of two sub-groups of the population, which are expected to be responding in a differentiated manner to the influences of the social, economic, and cultural environmental factors.

The three major methodological advantages that the Proximate Determinants approach provides when assessing the relationship between fertility and migration are:

(i) Both the analytical framework of the Intermediate fertility Variables and the quantitative approach of the Bongaarts' Proximate Determinants model, were originally designed and proposed as means for the purpose of comparative fertility analysis;

(ii) The major demographic hypotheses on the relationship between migration and fertility that have been empirically tested seem to be implicitly embedded within the framework and the model, since the hypotheses propose the presence of 'cultural-environmental' influences or behavioral and 'biologically-related' factors to explain the differences in reproductive patterns between mobile and non-mobile populations, and;

(iii) Since the Bongaarts' model provides an instrument of aggregated macro-evaluation, this allows us to fulfil one of the main aims of the research on the migration-fertility relation, which is that of assessing its impact on population structure and dynamics.

From the specific implementation of the framework and the model for Baja California, furthermore, the observed results allow us to suggest that future implementations of the proposed approach in the research on the fertility-migration relationship, could greatly benefit by the inclusion of a factor - that we were unable to assess due to the given data-structure of our main source of information - which allows us to take into consideration the fertility inhibiting effects of temporary spousal separation (i.e. due to causes other than marital-disruption, such as seasonal-labour migration), in order to further explain the differentiated fertility outcomes between migrant and non-migrant groups.

If future implementations of the suggested approach were to prove that such factors improve our ability to assess the differences in reproductive behaviour of those groups, then they will provide further support for the contention that the conventional assumption that "sexual exposure within marriage was so universal and frequent that this variable (i.e. coital frequency) could properly be ignored" (Rindfuss, et.al.:1989;206) may need to be revised.

In this regard, therefore, previous modelling assessments (Menken:1979), a growing amount of empirical evidence (Bumpass,et.al.:1986. Hobcraft:1987. Rindfuss, et.al.: 1989), and our own results seem to suggest that the use of surrogate measurements to identify non-zero coital frequency states (i.e. marital status) can no longer be accepted at face value, and that this indicates the requirement of either complementary measures and/or efforts to collect adequate information about the 'real' proximate determinants of fertility.

5.2.3.- Policy.

Within the specific objectives of Mexico's official and current National Population Program, the aim of promoting a slower pace of population growth through fertility reduction has been given the set goals of "reducing the total population growth-rate to a level of 1.8% by 1994, and to 1.5% by the year 2000...(under the assumption that the observed)... declining fertility trends will hold and that, therefore, the expected TFRs...(for those same dates)...will be of 2.8 and 2.4 children per woman" (O.T. CONAPO:1989;35-47).

Given that our findings indicate that by 1986 the native and inmigrant population TFRs were, respectively, 2.75 and 3.26 children per woman, our contention is that at least in the case of the state of Baja California the achievement of the above mentioned demographic goals, will demand a set of policy-measures that should allow for targeting activities on a group-specific basis.

The results reported in Chapter III, allow us to suggest the following areas for group-selective policy intervention. Firstly, the activities oriented to the promotion of later ages for first-union initiation - whether by legislative, educational or any other means - should be particularly targeted towards the inmigrant population, both on the grounds that among this group there is a higher degree of room for improvement (i.e. due to their lower mean age at marriage), and that the fertility reduction effect of such increase would be of higher magnitude due to the observed native-migrant composition of the population in Baja California.

Secondly, the activities of both the official and the private family planning programs should be oriented to the achievement of higher levels of method-acceptance in the NP-MWRA group of the inmigrant population, and within it the five younger age-groups (i.e. 15 to 39) should be assigned a higher priority. This line of age- and group-specific activity-targeting could prove to be of significant importance, since its fertility inhibiting effects would be based both on the birth-interval length increment that can be expected among new 'birth-spacing' users, as well as from the expected increase in the proportions of 'child-stopping' behaviour among users who have achieved their desired family size.

The third and final area in which we would like to suggest a group-selective policy intervention for the specific case of Baja California, is that public and private health services should promote an increase in the proportion of native women who breast-feed their children, and an increase in the length of the breast-feeding period. The magnitude of the improvement that can be achieved in this area is particularly significant given that virtually one out every two native women do not breast-feed at all and that, therefore, there are sufficient conditions to expect not only the 'direct' biologically-based fertility inhibiting effects of the lengthening of the post-partum infecundable period, but also the 'indirect' effects that the increase in breast-feeding can generate through its possible consequences in the improvements of infant mortality.

Finally, it should be noted that the suggestion of a group-selective targeting policies by no means advocates the lack of wider-target activities, and that from our findings there seem to be clear indications that activities oriented towards, for instance; the promotion of contraceptive-use for the purpose of first-birth delays; to increase the availability of contraceptive methods in the rural communities, and; the promotion of increasing levels of contraceptive-acceptance among males, could prove to be of significant consequences in the achievement of the set demographic goals, for both the native and inmigrant groups of Baja California.

ANNEX 'A'.- 1986 Baja California Demographic Survey Data Evaluation.

A.1.- Internal Consistency.

A.1.1.- Sex and Age Structure.

A.1.1.1.-Masculinity index.

The 1986 Baja California's Demographic Survey (BCDS) was based on a probability self-weighted multi-stage household sample, selected from four independent Municipal sampling frames which were purpose-built for the implementation of the BCDS, on the basis of the enumeration districts from the 1980 Population and Housing Census.

The sample design defined a sample size of 1,200 households for each of the four Municipios of the State, with an internal distribution of 1,000 interviews for the urban areas and 200 for the corresponding rural population, in order to insure representativeness for both types of population, at the Municipal and state level.

From the 4,300 completed household interviews, which were carried-out between October the 13th and December the 6th 1986, information was gathered for 19,192 individuals. Out of that total only 28 (i.e. 0.15%) were missing the corresponding age information, leaving a total sample of 19,164 persons, which included 9,568 males and 9,596 females.

Table A.A.1 presents the age distribution by five years of age groups and their corresponding masculinity index, for the total sample as well as for the urban, and inmigrant categories. For the whole sample the sex ratio values are mostly within the expected 'typical' range of 95 to 105 males to females. Nevertheless it seems noteworthy that from ages 20-24 up to 40-44 there is a tendency for the sex ratio to be under 100.0, indicating a preponderance of females in that age range.

A second feature depicted by the masculinity index for the total sample is that of the particular behaviour that they present from ages 65 onwards. From age 65 up to 79 the sex ratio indicates a predominance of males which can be associated either to the known practise of age 'exaggeration' among males at old ages or to the remaining effects of past inflows of inmigrants to the area.

TABLE A.A.1
AGE AND SEX DISTRIBUTION, AND MASCULINITY INDEX. TOTAL POPULATION, 1986 BCDS (SAMPLE DATA).

AGE GROUP	BAJA CALIFORNIA			
	TOTAL	MALE	FEMALE	M.I.
TOTAL	19164	9568	9596	99.7
0-4	2291	1136	1155	98.4
5-9	2353	1145	1208	94.8
10-14	2490	1292	1198	107.9
15-19	2348	1184	1164	101.7
20-24	2033	993	1040	95.5
25-29	1561	776	785	98.9
30-34	1317	649	668	97.2
35-39	1078	539	539	100.0
40-44	831	408	423	96.5
45-49	698	338	360	93.9
50-54	639	333	306	108.8
55-59	502	253	249	101.6
60-64	371	187	184	101.6
65-69	249	135	114	118.4
70-74	160	87	73	119.2
75-79	123	65	58	112.1
80 +	120	48	72	66.7
0-14	7134	3573	3561	100.3
15-64	11378	5660	5660	99.0
65 +	652	335	317	105.7

Source: CONEPO-B.C.,CRIM-UNAM, IIS-UABC (1987). 1986 BCDS.

TABLE A.A.1 (Continues)
AGE & SEX DISTRIBUTION, AND MASCULINITY INDEX.
URBAN & INMIGRANT POPULATION, 1986 BCDS (SAMPLE DATA).

AGE GROUP	URBAN POPULATION				INMIGRANT POPULATION			
	TOTAL	MALE	FEMALE	M.I.	TOTAL	MALE	FEMALE	M.I.
TOTAL	14334	7085	7249	97.7	9851	4893	4958	98.7
0-4	1699	831	868	95.7	368	182	186	97.9
5-9	1718	844	874	96.6	566	256	310	82.6
10-14	1819	957	862	111.0	769	400	369	108.4
15-19	1747	873	874	99.9	968	488	480	101.7
20-24	1534	739	795	93.0	1108	551	557	98.9
25-29	1213	583	630	92.5	946	466	480	97.1
30-34	1029	511	518	98.7	917	444	473	93.9
35-39	845	415	430	96.5	854	428	426	100.5
40-44	638	312	326	95.7	716	343	373	92.0
45-49	503	239	264	90.5	616	302	314	96.2
50-54	451	237	214	110.8	588	302	286	105.6
55-59	382	181	201	90.1	468	237	231	102.6
60-64	281	131	150	87.3	349	176	173	101.7
65-69	188	98	90	108.9	228	124	104	119.2
70-74	115	59	56	105.4	154	83	71	116.9
75-79	87	43	44	97.7	120	64	56	114.3
80 +	85	32	53	60.4	116	47	69	68.1
0-14	5236	2632	2604	101.1	1703	838	865	96.9
15-64	8623	4221	4402	95.9	7530	3737	3793	98.5
65 +	475	232	243	95.5	618	318	300	106.0

Source: CONEPO-B.C.,CRIM-UNAM, IIS-UABC (1987) **1986 BCDS.**

In this particular instance, the latter seems to be the case since the cohorts with current ages 65 to 79 by 1986 could be associated with the survivors of the large number of inmigrants that came into the area during the 1940s and early 1950s (attracted by a massive land-reform program), due to the fact that at that point in time the members of this group must have been between the ages of 19 to mid forties, which is an age range strongly associated with economic migrants.

The third point that can be raised in relation to the sex ratios for the total sample data is the one concerned with the values observed for this index in the adjoining age groups 5 to 14 and 45 to 54, and the particular low masculinity index that presents the open-ended age group of 80 years and over.

For the two pairs of adjoining age groups mentioned the sex ratios are unusually low for the younger group (5-9 & 45-49), and unusually high for the corresponding older age groups (10-14 & 50-54), a fact that in our view strongly suggest age misreporting among the male persons of these age groups, since there is an increase and virtually no attrition, respectively, between the numbers of males enumerated in the younger age groups and those included in the older age groups. As it would be mentioned below, this pattern of age heaping can be associated with a digit preference for ages ending in zero.

In the case of the low sex ratio observed for the open-ended age group of 80 years and over, one can suggest that at least two related factors could be operating at the same time. On the one hand it may very well be that the sex ratio may be affected by the usual heavier male mortality at old ages but, on the other hand, it also may be the case that the very small number of individuals included in the sample (the smallest number in the whole series of age groups) is affecting the results of this particular masculinity index.

The remaining set of figures included in Table A.A.1, those related to the urban and inmigrant populations, allow one to see that as in the case of the sample as a whole the values for the masculinity index are mostly within the expected range. However, as expected, the two sets of figures for these sub-groups of the sample reproduce some of the particular features noted for the whole population. A first such case is that of the predominance of females along the 20 to 44 age range which, in our view, indicates the preponderance of females among the inmigration flows and, furthermore, a possible concentration of the younger female inmigrants within the urban areas of Baja California.

The second issue that reappears in these sub-groups is that of the two pairs of adjoining age groups for which the sex ratios present unusually low and high values, respectively (i.e. from 5 to 14 and from 45 to 54). In the case of the younger pair of age groups the masculinity index seems to indicate that the above mentioned age heaping among males, tend to prevail more markedly within the inmigrant and urban population since these sub-groups present a wider gap between the adjoining sex ratios than that of the total sample.

For the older pair of age groups, the gap between the masculinity indexes seems to indicate that age heaping among males may be a characteristic only present for the native population - since the values for the sex ratios of the inmigrants are well within the 'normal' range (i.e. 96.2 & 105.6) - and that it tend to be concentrated among those natives living in the urban areas, since it is in those areas where the gap between sex ratios of adjoining age groups assumes its highest value.

On a related matter it seems worth noting that the two following age groups of the urban population (i.e. 55 to 59 and 60 to 64) present very low values for their corresponding sex ratios, which in this case seems to be a result of age heaping among females both from 50-54 to 55-59 and from 55-59 to 60-64, an issue which could be related to their digit preference for ages ending both in '5' or '0', and that will be dealt with in the following section.

A final point related with Table A.A.1 is that of the markedly higher values that the masculinity index presents for the inmigrant population at the age groups between 65 and 79 years of age. The high levels of this index for the inmigrant population seems to support the notion, mentioned above, that they are the remaining effects of the predominance of males among the migrants inflows of the 1940s and early

1950s.

A.1.1.2.-Digit preference.

When dealing with the age structure of the population included in the BCDS, a first point worth noting is that of the relatively smooth transitions that can be observed between most of the age groups of the series presented in Table A.A.1. Nevertheless, the few deviations from the pattern already mentioned are those that seem to be present in the three pairs of adjoining age groups with unusually low and high sex ratios (i.e. within the range 5 to 14, 45 to 54 and 55 to 64).

In order to seek for some evidence that would help explain and measure such irregularities in the age structure of the sample and its subgroups, an analysis of digit preference for single years of age was carried out and its results are presented in Table A.A.2.

From the information related to the deviation from the expected 10.0% distribution between ending digits of the declared ages, one can point out at least three interrelated patterns of digit preference among the sampled population. The stronger of those patterns seems to be the avoidance of ages ending in '1' since this digit presents a consistently negative sign for all subgroups included in the Table, and also since it involves most of the higher values for the deviation from the expected 10.0% distribution.

Related to the avoidance pattern for the digit '1' one can also observe a strong clustering at ages ending in '0' and '2', which is indicated by the uniform positive sign in the values for these digits and also by the relatively high levels of discrepancy from the expected 10.0% distribution, discrepancy that in this case seems to be stronger for the ages ending in 'zero' than that of ages ending in digit '2'.

The last point mentioned in relation to the ages ending in digit '0' allows us to point to the second pattern of digital preference among the sample. In this case it relates to the consistent avoidance of ages ending in digit '9', as shown by the relatively high and negative values observed for all but one of the subgroups included in Table A.A.2, a pattern that in our view indicates a predominant tendency of age heaping from ages ending in digit '9' to ages ending with digit '0', although the small but positive values for ages ending with '8' should not be completely disregarded.

The third related pattern that can be observed from the data in Table A.A.2 is that of a weak but nevertheless present preference among the population to declare ages ending with 'even' digits, with the sole exception of digit '4' which presents consistently low and predominantly negative values for the deviation from the 10.0% distribution. This latter point seems to be associated with the small but mainly positive values that can be observed for the ages ending with digit '5'.

In order to have a comprehensive and overall measure of age heaping and digit preference the Myers' and Whipple's Indexes were computed for the whole sample and its subgroups, and the results are also presented in Table A.A.2. The first of these indexes, Myers' Index, has been defined as "a summary index of preference for all terminal digits, and is derived as one-half the sum of the deviations from 10.0%, each taken without regard to sign....If age heaping is nonexistent, the index would approximate to zero. This index is an estimate of the minimum proportion of persons in the population for whom an age with an incorrect final digit is reported. The theoretical range of Myers' Index is 0, representing no heaping, and 90 which would result if all ages were reported at a single digit" (Shryock, Siegel, et. al.;1976:118).

The values for the Myers index presented in Table A.A.2 are those corresponding to the total sum of the deviations from 10.0%, and they indicate that for the whole sample at least 4.6% of the population reported an age with an incorrect final digit. When considering the male and female subgroups of the whole population, it can be seen that the proportion reporting ages with incorrect ending digits is almost 10.0% larger for the male population than that of the female group, indicating better age reporting for women as a whole.

TABLE A.A.2
DEVIATION FROM 10.0% AT EACH TERMINAL DIGIT OF AGE, AND MYERS' & WHIPPLE'S INDEXES (continuation) FOR POPULATION 10 TO 79 & 23 TO 62, RESPECTIVELY. 1986 BCDS.

POPU-LATION	D I G I T S									
	0	1	2	3	4	5	6	7	8	9
TOTAL	1.7	-2.1	1.1	-0.1	-0.4	0.5	0.6	-0.9	0.5	-1.0
MALES	1.4	-2.2	1.2	-0.1	-0.2	0.2	0.9	-1.2	0.8	-1.0
FEMALES	1.9	-2.0	1.0	-0.1	-0.6	0.7	0.3	-0.6	0.2	-1.0
TOTAL URBAN	1.6	-2.0	1.1	-0.1	-0.4	0.5	0.7	-0.9	0.5	-1.1
MALES	1.6	-2.1	1.2	-0.1	-0.1	0.1	0.9	-1.3	0.5	-0.7
FEMALES	1.7	-2.0	0.9	-0.2	-0.6	1.0	0.6	-0.5	0.5	-1.4
TOTAL RURAL	1.9	-2.3	1.4	0.2	-0.4	0.3	0.3	-0.9	0.3	-0.8
MALES	1.1	-2.5	1.3	0.1	-0.4	0.6	1.0	-1.0	1.5	-1.8
FEMALES	2.8	-2.1	1.5	0.4	-0.5	-0.1	-0.3	-0.9	-0.8	0.1
INMIGT. TOTAL	2.3	-2.6	1.5	0.1	-0.6	0.2	0.9	-1.1	0.5	-1.2
MALES	1.9	-2.5	1.8	-0.1	-0.6	-0.1	1.3	-1.4	0.9	-1.1
FEMALES	2.6	-2.6	1.1	0.3	-0.7	0.6	0.6	-0.8	0.1	-1.4
NATIVES TOTAL	0.6	-1.2	0.5	-0.3	0.1	1.0	0.1	-0.6	0.5	-0.6
MALES	0.4	-1.6	0.2	0.1	0.4	1.1	0.3	-0.9	0.5	-0.8
FEMALES	0.7	-0.8	0.8	-0.9	-0.3	0.9	-0.1	-0.2	0.5	-0.5

Derived by the author from: CONEPO-B.C., CRIM-UNAM, IIS-UABC (1987).

TABLE A.A.2
(Continues)

POPU-LATION	MYERS INDEX	WHIPP-LES'S INDEX
TOTAL	9.24	113.5
MALES	9.60	109.7
FEMALES	8.88	117.2
TOTAL URBAN	9.37	114.2
MALES	9.00	110.3
FEMALES	9.72	118.0
TOTAL RURAL	9.37	110.9
MALES	11.61	107.8
FEMALES	9.94	114.4
INMIGT. TOTAL	11.40	112.3
MALES	12.12	106.9
FEMALES	11.32	117.6
NATIVES TOTAL	5.77	117.0
MALES	6.73	118.1
FEMALES	6.17	115.9

Derived by the author from: **CONEPO-B.C., CRIM-UNAM, IIS-UABC** (1987).

In the case of the remaining subgroups of the population, their corresponding Myers' index values indicate that the proportions of age misreporting vary between 3.1 and 6.1%, and they also allow one to see a pattern of better age reporting among both natives and urban populations, than that of the rural and inmigrant subgroups.

A third pattern that can be observed from the series of Myers indexes presented in Table A.A.2 relates to the fact that with the only exception of the urban females, the values of the index suggest a better age reporting on the part of all the female subgroups of the five population categories presented.

On the other hand - looking at the series presented in the same table for the Whipple Index - it can be seen that the values of the Whipple index indicate that with the exception of the native females, all the women's subgroups present a higher preference for ages ending with digits '0' or '5', than males.

For the whole population, however, the value of the Whipple index indicates that within the sample the reported ages included 13.5% more cases ending with digits '0' or '5' than those accounted for in the corresponding unbiased population assumed by the index computation.

The range of values that the Whipple index present for the remaining subgroups of the sample, suggest that the range of departure from the expected distribution for ages ending in digits '0' or '5' can be set between 6.0 & 18.0%. This range of variation for the value of the index computed for the sample of the BCDS, fits very well into the range defined by the values obtained when computing the Whipple's index for the data from Baja California's 1970 and 1980 Population and Housing Censuses, which respectively give values of 118.9, 117.8, 119.9, and 113.0, 111.9 and 114.0 for the corresponding total, male, and female populations (see Table A.A.3).

A.2.- External Comparison.

A.2.1.- Age and sex accuracy.

In order to assess the overall quality of the combined age reporting and sex structure obtained from the BCDS sample, and with the purpose of establishing a reference bench point from external sources against which the results of the BCDS could be compared, we have computed the Overall Accuracy of Age Data Index, and the United Nations Age and Sex Accuracy Index for the corresponding populations included in the BCDS, and in Baja California's 1970 & 1980 Population and Housing Censuses. The results of this procedure are presented in Table A.A.3, and in it we have also included the available information for the Mexico Fertility Survey 1976-77, and that of 41 fertility surveys of the World Fertility Survey program.

As can be see in Table A.A.3 the value of the U.N. age-sex accuracy index - which combines the sum of (a) the mean deviation of the age group ratios for males from 100.0, (b) the mean deviations of the age group ratios for females from 100.0, and (c) three times the mean of the age-group-to-age-group differences in reported sex ratios computed for the BCDS sample - indicates that its reported age and sex structure are less distorted than those of the populations included in the 1970 Baja California Population and Housing Census, the Mexico Fertility Survey 1976-77, and all the remaining forty countries included in the assessment of data quality for their corresponding fertility survey, which were carried out under the WFS program (Goldman, Rutstein & Singh: 1985).

The situation above described holds when one considers the values presented for the index of the overall accuracy of age data - which is one half the sum of the mean deviations of the age ratios for males and females - since, as it was the case with the U.N. age-sex index, only the data included in the 1980 Baja California Population and Housing Census seems to present a less distorted age structure than that of the population included in the BCDS.

A.2.2.- Data for females.

Since our main concern in this thesis relates to the reproductive behaviour of the female population of Baja California, we have computed three measurements to assess the quality of the age structure reported in the BCDS, taking into consideration the availability of comparable external information.

These three measurements - which are the female age-ratio index for age groups 20 to 44 and 25 to 44, the Whipple's Index for single ages 23 to 69, and the Myers' Summary for females between the ages of 10 and 79 - are presented in Table A.A.3.

The first of these indexes has been computed in order to measure the distortion of the five-year age groups distribution - calculated as the sum of the deviations of the age-ratio from 100.0 - and surveys usually have been classified according to the values adopted by the index in the following fashion; "a value 20 or below indicates low distortion, 20 to 35 shows that distortion is present but that the distribution is still acceptable, and a value above 35 means that distortions make the age distribution unacceptable" (Goldman, Rutstein & Singh;1985:18).

On this basis both values presented for the age-ratio index indicate that the female five-year age groups distribution of the BCDS presents low distortion, and that in the case of the measurement for the 25 to 44 age range the value for the BCDS data is on the low boundary of the range for the values of the 13 American countries included in the WFS program, and also that only 2 out of the 41 countries included in the data quality assessment presented a value under 11.0 for the index of this particular age range.

TABLE A.A.3
OVERALL REPORTING ACCURACY FROM FIVE SELECTED DATA SOURCES.
(1970-1986)

MEASUREMENT	DATA SOURCE				
	B.C. D.S. 1986	B.C. 1980 CENSUS	M.F.S. 1976 1977	B.C. 1970 CENSUS	41 WFS ASSESS-MENT.
U.N. AGE-SEX ACCURACY INDEX	20.5	17.3	26.0	26.8	26/69* ALL >25
OVERALL ACCURACY OF AGE DATA	2.78	2.68	3.33	3.13	N.A.
FEMALE AGE-RATIO INDEX; (20 TO 44)	15.3	10.7	32.0	12.0	3 Out of 41 < 16
(25 TO 44)	10.9	9.3	20.4	12.0	2 Out of 41 < 11
WHIPPLE'S (a) INDEX FOR; FEMALES	117.2	114.0	113.9	119.9	104.5 to 146.6* 96/306**
MALES	109.7	111.9	N.A.	117.8	N.A.
TOTAL	113.5	113.0	N.A.	118.9	N.A.
MYERS' INDEX FOR FEMALES (b)	8.88	6.46	9.35	8.20	8.5/23.3* 5.0/82.6**

Notes: (*).- Values corresponding to 13 American and Caribbean countries. **(**).-** Values corresponding to all 41 countries included in the data assessment. **N.A.-** Not available. **(a).-** Baja California values computed for age range 23 to 62, WFS values for age range 20 to 49. **(b).-** Baja California values computed for age range 10 to 79; WFS values computed for age range 20 to 49. **Sources: CONEPO-BC, CRIM-UNAM, IIS-UABC** (1987). **Goldman, N. et.al.** (1985).

The values for the remaining two indexes, Whipple's and Myers', depict very much the same situation than the female age ratio index, in that they suggest that on the whole the data from the BCDS compares well with that of the other available sources. For instance, values between 110.0 & 130.0 for the Whipple's index have been defined as an indicator of acceptable survey data when considering age reporting with ending digits '0' or '5' (Ibid;1985:p.17), and the value for the data of the females included in the BCDS is in the order of 117.2. By the same token, values under 10.0 for the Myers' index of digital preference are considered to indicate good quality of the data set, and in this case the BCDS data presents a value of 8.9.

A.3.- Discussion and Recommendations.

From the foregoing assessment of the BCDS data it can be stated that based on the masculinity index analysis, the inconsistencies that the sex structure present for the most part can be accounted for by considering the migratory tradition that characterises the area of Baja California. Its migratory history allows one to understand the particularly unbalanced sex-ratios for the older age groups, and the recent inmigratory flows seem to be behind the moderate excesses of females within the economically-productive age range.

As in the case of the masculinity index analysis, the migratory status of the population also seems to influence the patterns of age reporting, since natives and females show less distorted age structures than the inmigrant and male populations.

This pattern of better age reporting on the part of females, however, does not preclude the fact that at the same time the women included in the sample denoted a higher preference for declaring ages ending with digits '0' or '5', to the detriment - mostly - of those ages ending with digits '9' or '1' or '4'.

When compared against purpose-compatible and available data sets, the quality of the BCDS data can be considered in the range from 'good to acceptable', judging on the basis of the values that the indexes computed provided, and given their location within the classificatory ranges usually accepted for those purposes. Nevertheless, for the purpose of this thesis at least two considerations should be kept in mind when dealing with the age structure of the sampled population.

First, that the pattern of age heaping that seems to characterize the female population included in the BCDS, may lead to an effect of age exaggeration, even when considering five year age groups. This may be the case since the avoided end digits ('9' & '4') would tend to exclude women from any given age group, and the pattern of digit preference ('0' & '5') will attract women into the correspondingly following age group, which in all situations would involve an older age group.

The second general consideration is that both the pattern of age heaping and digital preference seems to be closely related to the migratory status of the population, and that therefore special consideration should be taken when dealing with particular subgroups of the population that may not be very well represented in the sample (i.e. inmigrants in the rural areas).

ANNEX 'B'.- 1986 Baja California Demographic Survey Questionnaire.

B.1.- Original Questionnaire.

ENCUESTA DEMOGRAFICA DE BAJA CALIFORNIA 1986

ENTREVISTA DE HOGARES

ENCUESTA DEMOGRAFICA DE BAJA CALIFORNIA

IDENTIFICACION DE LA VIVIENDA

Domicilio ______________________________
Calle — No. exterior — No. interior

Colonia (sector, barrio, fraccionamiento) ______________________________

Datos de localización ______________________________

Localidad Nombre ______________________________ Tipo Urb-Rur |_|_|

Municipio ______________________________ Clave |_|_|

Identificación muestral ______ |_|_|_|_|_| AGEB — |_|_| Listado — |_|_| Seleccion

RESULTADO DE LA ENTREVISTA	No. DE HOGARES [ ][ ]	HOGAR No. [ ][ ]		
Número de visita		1	2	3
Fecha (día, mes)				
Entrevista completa				
Sin entrevista	Nadie en casa			
	Rechazo			
	Otro (especifique)			
Duración	Hora de inicio			
	Hora en la que terminó			

DATOS DE CONTROL DEL CUESTIONARIO

Nombre del entrevistador ______________________________

Nombre del supervisor ______________________________

Observaciones ______________________________

ENCUESTA DEMOGRAFICA DE BAJA CALIFORNIA

Buenos días, estamos realizando una encuesta en Baja California para conocer el número de personas que viven en este estado, algunas de sus características socioeconómicas y la movilidad que han tenido dentro de la República Mexicana y hacia el exterior. Su vivienda fue seleccionada en esta encuesta y por ello sus respuestas son de vital importancia para los objetivos de este proyecto. La información se mantendrá con carácter estrictamente confidencial por lo que en ningún momento se publicarán los nombres de las personas entrevistadas. Ahora, le voy a hacer algunas preguntas sobre las características de su vivienda.

SECCION I CARACTERISTICAS DE LA VIVIENDA

1. ¿Cuántos cuartos tiene esta vivienda? (sin contar, cocina, baños y pasillos)
2. ¿Cuántos de estos cuartos se utilizan como dormitorios?
3. ¿Tiene la vivienda cuarto para cocinar? (que no sea usado también como dormitorio)
   01 Si 02 No
4. ¿Esta vivienda es propia? (aunque se esté pagando o esté hipotecada)
   01 Si 02 No
5. ¿Los residentes de esta vivienda disponen de agua entubada?
   01 Si 02 No (pase a 6)
   5.1. ¿Dónde?
   01 Dentro de la vivienda
   02 Fuera de la vivienda, pero dentro del edificio, vecindad, terreno o predio
   03 De llave pública o hidrante
6. ¿Tiene esta vivienda tubería de drenaje?
   01 Si 02 No (pase a 7)
   6.1 El drenaje está conectado
   01 La tubería de drenaje está conectada a la calle
   02 Está conectada a una fosa séptica
   03 Escurre por la superficie
7. ¿Hay en la vivienda luz eléctrica?
   01 Si 02 No
8. ¿De qué material están hechos la mayor parte de los muros o paredes de esta vivienda?
   01 Tabicón, block, piedra, mampostería, cemento o ladrillo
   02 Madera 04 Lámina o cartón
   03 Adobe 05 Otros (especifique) ______________
9. ¿De qué material es la mayor parte de los pisos de esta vivienda?
   01 Tierra 02 Cimento 03 Madera u otros recubrimientos

SECCION II NUMERO DE RESIDENTES Y HOGARES

1. ¿Todas las personas que residen habitualmente en esta vivienda se sostienen de un gasto común para comer, sean o no parientes?
   01 Si (pase a 3) 02 No
2. ¿Cuántos hogares o grupos de personas hay en esta vivienda que se sostienen con gastos separados para comer?

(CUANDO EXISTA MAS DE UN HOGAR DENTRO DE LA VIVIENDA, HAGA UN CUESTIONARIO PARA CADA HOGAR)

3. ¿Cuántas personas residen habitualmente en este hogar?
   (No olvide ancianos, niños chiquitos, sirvientes, ni personas temporalmente ausentes) ______________

PARA TODOS LOS RESIDENTES HABITUALES DE LA VIVIENDA

1 No. de registro	2 Nombre	3 Relación Parentesco	4 Sexo	5 Edad
Circular informante	Empezando con el JEFE DEL HOGAR, ¿Me podría decir los nombres de cada una de las personas que viven aquí, así como su relación de parentesco con el Jefe del Hogar? CODIGO PARENTESCO: 01 Jefe del Hogar 02 Cónyuge del jefe 03 Hijo(a) o Hijastro(a) del jefe 04 Yerno o Nuera del jefe 05 Nieto(a) del jefe 06 Padre, madre, suegro del jefe 07 Hermano(a) o cuñado(a) del jefe 08 Otro pariente del jefe (tío, primo, abuelo, etc.) 09 Otro no pariente (amigo, compadre, etc.) 10 Sirviente 11 Huesped o pensionista 12 Otro		¿Es hombre o mujer? 01 Hombre 02 Mujer	¿Cuantos años cumplidos tiene ...? (Para menores de un año utilice cero-cero)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

5.1. ¿Hay alguien más que viva aquí como recién nacido, niños chiquitos, sirvientes, huespedes o ancianos que no haya contado?
01 Si (anótelos en el cuestionario) 02 No

5.2. Finalmente ¿Hay algún miembro del hogar que habitualmente vive aquí, pero que se encuentre ausente por motivos de trabajo, vacaciones, de visita o en el hospital?
01 Si (anótelos en el cuestionario) 02 No

PARA TODOS LOS RESIDENTES HABITUALES DE LA VIVIENDA

6 Sobrevivencia madre	7 Lugar de nacimiento	8 Tiempo de residencia actual		9 Lugar de residencia anterior
¿Actualmente vive la madre de . . .? 01 Sí 02 No 99 NS	¿Dónde nació . . .?	¿Cuánto tiempo hace que vive en esta localidad? 01 Años 02 Meses 03 Días 04 Siempre (pase a 13) 99 NS		¿Dónde vivía antes . . .?
		Código	No	
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país
	Municipio			Municipio
	Entidad o país			Entidad o país

PARA LAS PERSONAS DE 6 AÑOS CUMPLIDOS O MAS	PARA LAS PERSONAS DE 18 AÑOS CUMPLIDOS O MAS	
10 Lugar de residencia en 1980	11 Lugar de residencia en 1970	12 Lugar de residencia a los 12 años de edad?
¿En qué lugar vivía en 1980?	¿En qué lugar vivía en 1970?	¿En qué lugar vivía cuando tenía 12 años de edad? (Anotar en todos los casos localidad, municipio y entidad federativa o país)
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país
Municipio	Municipio	Localidad
Entidad o país	Entidad o país	Municipio
		Entidad o país

PARA HOMBRES Y MUJERES DE 6 AÑOS O MAS DE EDAD							PARA HOMBRES Y MUJERES DE 12 AÑOS O MAS DE EDAD		
13 Alfabetismo	14 Nivel de escolaridad		15 Estudia actual	16 Escolaridad actual		17 Lugar de estudios	18 Estado Civil	19 Trabajo en EE.UU.	20 Tarjeta verde
¿Sabe leer y escribir? 01 Si 02 No 99 NS	¿Cuál fue el último grado de estudio que aprobó? (ver código)		¿. . . estudia actualmente? 01 Si 02 No } pase 99 NS } a 18	¿Qué grado y nivel estudia . . .? (vea código) p. 14		¿Dónde estudia . . .? (ver código)	¿Cuál es actualmente el estado civil de . . .? (anote código)	¿Esta persona ha ido a trabajar o buscar trabajo a los EE.UU. en los últimos cinco años? 01 Si 02 No 99 NS	¿Esta persona es emigrado? 01 Tarjeta verde 02 Ciudadano Norteamericano 99 NS
	Grado o año	Nivel		Grado o año	Nivel				

Código p. 14
00 Sin estudios
01 Kinder, preescolar o preprimaria
02 Primaria
03 Técnico con primaria
04 Secundaria o equivalente
05 Técnico con secundaria
06 Preparatoria o vocacional
07 Técnico con preparatoria
08 Normal
09 Profesional
10 Posgrado
99 No sabe

Código p. 17
01 Esta localidad
02 Otra localidad del municipio
03 Otro municipio del Estado
04 Otro Estado
05 EE.UU.
06 Otro país
99 N.S.

Código p. 18
01 Casado
02 Unión libre
03 Divorciado
04 Separado
05 Viudo
06 Soltero
99 N.S.

PARA HOMBRES Y MUJERES DE 12 AÑOS O MAS DE EDAD							
21 Condición de presencia semana pasada	22 Tiempo de ausencia semana pasada	23 Tiempo de ausencia		24 Lugar de presencia		25 Motivo de ausencia	26 Condición de presencia actual
Esta persona ¿Durmió en la casa todas las noches de la semana anterior (es decir del domingo al sábado de la semana pasada) 01 No 02 Si } pase 99 NS } a 26	¿Cuántas noches no durmió esta persona en la casa durante la semana pasada? ____Noches	¿Y desde cuándo estuvo ausente de la casa? 01 Días 02 Meses 03 Años 99 NS		¿Dónde estuvo . . . durante ese tiempo? (anote código)		¿Por qué motivo estuvo . . . ausente de la casa? (anote código)	¿Esta persona durmió en la casa anoche? 01 Si 02 No 99 NS
		Código	tiempo	Código	Otro Edo. especificar		

Código p. 24
01 Esta localidad
02 Otra localidad del municipio
03 Otro municipio del Estado
04 Otro Estado
05 EE.UU.
06 Otro país
07 Otro lugar (mar)
99 N.S.

Código p. 25
01 Trabajo
02 Búsqueda de trabajo
03 Vacaciones
04 Compras
05 Visita
06 Estudio
07 Otro motivo
08 Atención médica
99 N.S.

PARA HOMBRES Y MUJERES DE 12 AÑOS O MAS DE EDAD

27 Condición de actividad		28 Actividad la semana pasada	29 Posición en el trabajo	30 Ocupación principal
Durante la semana pasada ¿trabajó . . . para sostener a la familia o cubrir alguno de sus propios gastos, al menos una hora al día? 01 Si 02 No 99 NS 27.1 ¿Cuantas horas diarias? (anote horas y pase a p. 29)		Entonces, ¿A qué se dedicó esta persona la mayor parte de la semana pasada? (anote código)	Ahora le voy a hacer algunas preguntas sobre el trabajo principal que tuvo . . . la semana pasada, En su trabajo principal de la semana pasada . . . era: anote código) (lea código)	¿Cuál es el nombre del oficio, profesión, puesto o cargo que . . . desempeñó en su trabajo principal de la semana pasada? (ver código)
CODIGO	HORAS			

Código p. 28.
01 Tenía trabajo pero estaba de vacaciones, permiso, enfermedad incapacitado temporal, etc. } pase a 29
02 Buscó trabajo y ya ha trabajado antes. } pase a p. 33
03 Buscó trabajo y no ha trabajado antes. } pase a p. 36
04 Estudios
05 Quehacer del hogar
06 Jubilado o pensionado
07 Vive de sus rentas
08 Incapacitado permanente
09 Otro
99 No Sabe
} Si es hombre pase a siguiente persona o sección. Si es mujer pase a p. 36

Código p. 29
01 Patrón
02 Subcontratista
03 Trabajador por su cuenta
04 Trabajador cooperativista
05 Trabajador a sueldo fijo, salario o jornal.
06 Trabajador a destajo, propina, comisión o porcentaje
07 Trabajador no familiar sin pago.
08 Trabajador familiar sin pago
09 Otro
99 No Sabe

Código p. 30
01 Profesionales y técnicos afines
02 Funcionarios superiores y de categoría directiva en la Administración Pública
03 Funcionarios superiores administradores y Propietarios del Sector Privado excepto del Sector Agropecuario
04 Administradores, Gerentes y Propietarios del Sector Agropecuario
05 Administradores, Gerentes y Propietarios del Sector Pesquero
06 Trabajadores directos y operarios de maquinaria del proceso agropecuario
07 Trabajadores directos y operarios de maquinaria en el proceso de producción del Sector Pesquero.
08 Trabajadores directos y operadores de maquinaria en el proceso de Producción Industrial
09 Personal Administrativo y personas en ocupaciones afines
10 Comerciantes, vendedores y similares
11 Trabajadores en servicio al público y servicios personales excepto doméstico
12 Trabajadores en servicio doméstico
13 Operadores de equipo de transporte excepto choferes particulares
14 Trabajadores con ocupaciones no clasificadas anteriormente o insuficientemente especificadas
99 No sabe

PARA HOMBRES Y MUJERES DE 12 AÑOS O MAS DE EDAD

31 Rama de actividad	32 Ingreso			33 Condición de trabajo año pasado?	34 Tiempo trabajado año pasado	35 Lugar de trabajo
¿A qué se dedica el establecimiento (negocio, fábrica, empresa, institución o rancho) donde tiene su trabajo o empleo principal? (ver código)	En el trabajo principal de la semana pasada ¿Cada cuándo obtiene sus ingresos o le pagan? (escuche y clasifique el período, después haga la siguiente pregunta) ¿Cuánto ganó o en cuánto calcula sus ingresos? (anote código) 01 Diario 02 Cada semana 03 Cada 15 días 04 Cada mes 05 Le pagan por servicio, obra o pieza 99 NS			¿Trabajó alguna vez en los últimos 12 meses? 01 Si 02 No Pase a 35	¿Cuánto tiempo trabajó . . .? 01 Doce meses 02 De 6 a 11 meses 03 Menos de 6 meses 04 De vez en cuando 99 N.S.	¿En qué lugar se encuentra el trabajo principal de . . .(o donde busca trabajo)? (anote código)
	TIEMPO	(pesos en miles) CANTIDAD	01 Pesos 02 Dólares MONEDA			

Código p. 31
01 Agricultura, ganadería, silvicultura, caza
02 Pesca
03 Explotación de minas y canteras
04 Industrias de transformación
05 Industria maquiladora
06 Construcción
07 Generación, transmisión y distribución de energía eléctrica
08 Comercio
09 Transporte
10 Gobierno
11 Establecimientos financieros, seguros, bienes inmuebles
12 Turismo (hoteles, restaurantes)
13 Servicios de educación
14 Servicios domésticos
15 Servicios técnicos y profesionales
16 Otros servicios
17 Actividades insuficientemente especificadas
99 No sabe

Código p. 35
01 Esta localidad
02 Otra localidad del municipio
03 Otro municipio de B.C.
04 Otro Estado del país
05 EE.UU.
99 N.S.

PARA MUJERES DE 12 AÑOS O MAS DE EDAD							
36 Número de hijas (mujeres)				37 Número de hijos (varones)			
36.1 ¿Cuántas hijas que nacieron vivas ha tenido esta persona en toda su vida (estén vivas o no actualmente)? No. ____ 98 Ninguna / 99 N.S. pase a 37.1	36.2. ¿Cuántas de estas hijas están vivas actualmente? No. ____ 98 Ninguna / 99 N.S. pase a 37.1	36.3 ¿Cuántas de sus hijas sobrevivientes viven en EE. UU.? No. ____ 98 Ninguna 99 N.S.	36.4. ¿Cuántas de sus hijas sobrevivientes viven en B.C.? No. ____ 98 Ninguna 99 N.S.	37.1. ¿Cuántos hijos que nacieron vivos ha tenido esta persona en toda su vida (esten vivos o no actualmente)? No. ____ 98 Ninguno / 99 N.S. pase a 38	37.2. ¿Cuántos de estos hijos están vivos actualmente? No. ____ 98 Ninguno / 99 N.S. pase a 38	37.3. ¿Cuántos de sus hijos sobrevivientes viven en EE. UU.? No. ____ 98 Ninguno 99 N.S.	37.4. ¿Cuántos de sus hijos sobrevivientes viven en B.C.? No. ____ 98 Ninguno 99 N.S.

PARA MUJERES DE 12 AÑOS O MAS DE EDAD												
38 último hijo							39 anticoncepción					
Sólo para mujeres que han tenido cuando menos un hijo o hija (ver p. 36.1. y 37.1.; sin hijos pasa a p. 39)							Sólo para mujeres de 12 a 49 años de edad					
38.1. ¿En qué fecha tuvo esta persona su última hija o hijo nacido vivo?		38.2. ¿Este hijo(a) está vivo(a) actualmente? 01 Sí 02 No (fecha de muerte) 99 N.S.		38.3. ¿Dónde la atendieron en este último parto? (anote código)	38.4. ¿Le dió el pecho a su último(a) hijo(a) nacido vivo(a)? 01 Sí 02 No / 99 N.S. pase a 4 39	38.5. Durante cuántos meses le dió el pecho? No. de meses 98 Aún se lo dá 99 N.S.	39.1. ¿Actualmente esta persona o su pareja hacen algo para no tener hijos? 01 Sí 02 Embarazada / 03 No / 99 NS pase a siguiente persona o sección	39.2 ¿Qué hace esta persona o su pareja para no tener hijos? (anote código) En caso de que mencione más de un método anotar los tres primeros y en las preg. 39.3 y 39.4 refierase al más efectivo	39.3. ¿Desde cuándo usa . . . (método más efectivo) sin interrupción (o cuando la(o) operaron)? 99-99 NS		39.4. ¿Donde consiguió . . . (método más efectivo) cuando lo empezó a usar, lo donde la operaron) (anote código)
MES	AÑO	Código	02 fecha Mes/Año						MES	AÑO	

Código 38.3.
01 S.S.A.
02 I.M.S.S.
03 I.S.S.S.T.E.
04 Otras Instituciones de Seguridad Social (ISSSTECALI, Marina, etc)
05 Otras instituciones públicas (Cruz Roja, Hospital Civil)
06 Hospital o clínica privada en México
07 En su casa
08 En EE.UU.
99 N.S.

Código 39.2.
01 Operación femenina
02 Vasectomía
03 Pastillas
04 Inyecciones
05 Dispositivos
06 Ovulos, jaleas, espumas
07 Condones
08 Diafragma
09 Ritmo
10 Retiro
11 Otro
12 Aborto
99 N.S.

Código 39.4.
01 I.M.S.S.
02 IMSS-COPLAMAR
03 I.S.S.T.E.
04 ISSTECALI
05 S.S.A. (Hospital o Clínica)
06 S.S.A. (Encargada de la comunidad)
07 Otra institución gubernamental
08 Partera
09 [illegible]
10 Boticario
11 Consultorio, clínica u hospital privado
12 Otro
99 N.S.

SECCION IV INMIGRANTES TEMPORALES

1. ¿Hay alguna persona que no sea miembro de este hogar pero que haya dormido en casa una o más noches de la semana anterior (es decir del domingo al sábado de la semana pasada)?

- 01 Si
- 02 No } p. 2
- 99 N.S. }

1.1. ¿Cuántas personas? (durmieron la semana pasada) . . . . (No.)
(Pase a bloque "Semana anterior", haga preguntas 4 a 15, y regrese a pregunta 2)

2. ¿Y anoche durmió en la casa alguna persona que no sea miembro del hogar?

- 01 Si
- 02 No } Pase a siguiente
- 99 N.S. } sección

2.1. ¿Cuántas personas? (durmieron anoche) . . . . (No.)
(Pase a bloque "Anoche" y haga preguntas 4 a 13)

	3 No. de registro	4 Nombre	5 Relación de parentesco (código)	6 Sexo 01 Hombre 02 Mujer	7 ¿Cuántos años cumplidos tiene esta persona?	8 ¿Por qué motivo presente esta persona en la casa? (código)	9 ¿En qué lugar trabaja (o busca trabajo)? (código)	10 ¿Cuánto tiempo ha estado presente en la casa? 01 Días 02 Meses 99 N.S. — Código	10 — No.	11 ¿Dónde reside habitualmente esta persona? (código) — código	11 — Otro Estado especifique	Para personas de 6 años o más: 12 ¿Esta persona sabe leer y escribir? 01 Si 02 No 99 NS	Para personas de 12 años o más: 13 ¿Cuál es el estado civil de esta persona? (código)	14 Cuántas noches durmió esta persona en la casa la semana pasada? (código)	15 ¿Esta persona durmió anoche en la casa 01 Si 02 No 99 NS Código
Semana anterior	1														
	2														
	3														
	4														
	5														
Anoche	1														
	2														
	3														
	4														
	5														

p. 5.
- 01 Parientes
- 02 Amigo, compadre, conocido
- 03 Otro no pariente
- 99 N.S.

p. 8.
- 01 Trabajo
- 02 Busqueda de trabajo
- 03 Visita } pase a p. 10
- 04 Estudios }
- 05 Otro }
- 99 N.S. }

p. 9.
- 01 B.C.
- 02 EE.UU.
- 03 Otro Edo.
- 99 N.S.

p. 11.
- 01 Esta localidad
- 02 Otra localidad del municipio
- 03 Otro municipio del Estado
- 04 Otro Estado
- 05 EE.UU.
- 06 Otro país
- 99 N.S.

p. 13.
- 01 Casado
- 02 Unión libre
- 03 Divorciado
- 04 Separado
- 05 Viudo
- 06 Soltero
- 99 N.S.

SECCION V DEFUNCIONES.

1. Durante 1985 o 1986 murió alguna persona de este hogar?
- 01 Si
- 02 No } Pase a la
- 99 NS } siguiente sección

1.1. ¿Cuántas personas murieron . . . . (No.)
¿Me podría dar alguna información de ella(s)?

2 No. de registro	3 Nombre y apellidos	4 Sexo 01 Hombre 02 Mujer	5 Edad (en años)	6 Fecha del fallecimiento — mes	6 — año	7 Dónde murió (código)
1						
2						
3						

Código p. 7.
- 01. Este municipio
- 02. Otro municipio de B.C.
- 03. Otra entidad federativa
- 04. EE.UU.
- 99 NS

SECCION VI EMIGRACION.

1. Ahora quisiera preguntarle si alguien de este hogar se fue a vivir a otra localidad durante el último año?
(No olvide sirvientes, huespedes y otros no parientes)

- 01 Si
- 02 No
- 99 NS Fin de la entrevista

1.1. ¿Cuántas personas?
¿Me podría dar la siguiente información de ella(s)?

2 No. de registro	3 Nombre	4 Relación de parentesco con el jefe del hogar (anote código)	5 Sexo 01 Hombre 02 Mujer	6 Edad (años)	7 Lugar de residencia actual (anote código)

Código p. 4.
- 01 Cónyuge del jefe
- 02 Hijo(a) del jefe
- 03 Yerno o nuera del jefe
- 04 Nieto(a) del jefe
- 05 Padre, madre o suegro(a) del jefe
- 06 Hermano(a) del jefe
- 07 Otro pariente del jefe
- 08 Otro no pariente
- 09 Sirviente
- 10 Huesped o pensionista
- 11 Otro
- 99 NS

Código p. 7.
- 01 Otra localidad del municipio
- 02 Otro municipio de B.C.
- 03 Otra entidad (especifique)
- 04 EE.UU.
- 05 Otro país
- 99 NS

B.2.- Questionnaire Translation.

B.2.1.- Identification.

HOUSE IDENTIFICATION.

Address: Street, Road number, internal number.
City borough.

Localization data.

Name of Town Type (urban-rural)

Municipality Code

Sample identification

Geo-statistic basic unit(AGEB): List: Selection.

INTERVIEW RESULT No. of Households Household No.

Visit Number

Date of visit

Full interview

No interview; nobody in; rejection;
other (specify).

Interview duration; starting time;
finishing time.

QUESTIONNAIRE CONTROL DATA.

Interviewer's Name

Supervisor's Name

Remarks.

B.2.2.- Section I.

'Good morning; we are conducting a survey in Baja California to estimate the number of people who live in the state, some of their social and economic characteristics, and the mobility that they have had within Mexico and abroad. Your house has been selected for this survey and therefore your answers are of vital importance for the study's objectives. The information will be kept strictly confidential, and at no time any of the names of those interviewed would be published. Now, I would like to make some questions about the house's characteristics'.

SECTION I HOUSE CHARACTERISTICS.

1.- How many rooms are in this house? (kitchen, bathrooms, and corridors excluded).

2.- How many of those rooms are bedrooms?

3.- Does this house have a kitchen? (not used as bedroom).

01.- Yes 02.- No.

4.- Is this a owner-occupied house? (regardless of mortgage)

01.- Yes 02.- No.

5.- Do the residents of this house have access to piped-water?

01.- Yes 02.- No (Go to 6)

5.1.- Where can they get it?

01.- Inside the house.

02.- Outside the house, but within the building or plot.

03.- From a public tap or hydrant.

6.- Does this house have sewage?

01.- Yes 02.- No (Go to 7)

6.1.- What is it connected to?

01.- To the city sewage system

02.- To a septic tank.

03.- It runs on the surface.

7.- Does this house have electricity?

01.- Yes 02.- No

8.- What is the main material in the walls of this house?

01.- Bricks, blocks, stone, cement

02.- Wood

03.- Dust bricks

04.- Board or tin

05.- Other (specify).

9.- What is the main material in the floor of this house?

01.- Dust

02.- Cement

03.- Wood or other.

B.2.3.- Section II.

SECTION II.- NUMBER OF RESIDENTS AND HOUSEHOLDS

1.- Do all the persons who usually reside in this house have a common budget for food expenses, whether they are relatives or not?

01.- Yes (Go to 3) 02.- No.

2.- How many households or groups of persons that have separate budgets for food expenses are there in this house?

(WHEN THERE IS MORE THAN ONE HOUSEHOLD WITHIN THE HOUSE, DO A SEPARATE QUESTIONNAIRE FOR EACH HOUSEHOLD)

3.- How many persons usually reside in this household?
(DO NOT FORGET OLD-AGE PERSONS, SMALL CHILDREN, SERVANTS, OR TEMPORARILY ABSENT PERSONS)

B.2.4.- Section III.

SECTION III
TO ALL HABITUAL RESIDENTS OF THE HOUSEHOLD

1.- Register number (Encircle informant's number).

2.- Name. 'Beginning with the head of the household, could you please tell me the names of each of the persons that live here, as well as their relationship to the head of the household?'

3.- Relationship to the head of the household.

01.- Head of the household
02.- Spouse of the head
03.- Son/Daughter, or step children.
04.- Son/Daughter in-law
05.- Grand-son/grand-daughter
06.-Father/mother, or in-laws
07.- Brother/Sister, or in-law
08.- Other relative (uncle, cousin, grandparent)
09.- Other non-relative (friends, god-father)
10.- Servant
11.- Lodger/guest
12.- Other.

4.- Is this person a man or a woman?

01.- Male 02.- Female

5.- How many years-old is this person? (for those under 1 use double zero).

5.1.- Is there someone else who lives here like a new-born, small children, servants, lodgers or old-age persons that we have not included?

01.- Yes (include them in questionnaire) 02.- No

5.2.- Finally, is there any member of the household who usually resides here but that is temporarily absent due to work, holidays, visiting relatives, or in hospital?

01.- Yes (include them in questionnaire) 02.- No

6.- Is the mother of...... actually alive?

01.- Yes 02.- No 99.- Don't Know (D.K.)

7.- In which municipio was..... born?

Municipio______________ State or country______________

8.- How long has......... being living in this municipio?

01.- Years 02.- Months

03.- Days 04.- Always (go to 13)

99.- D.K..

(Code, and number of years, or months, or days).

9.- In which municipio was.... living before?

Municipio______________ State or country______________

TO RESIDENTS AGED 6 AND ABOVE:

10.- In which municipio was... living in 1980?

Municipio______________ State or country______________

TO RESIDENTS AGED 16 AND ABOVE:

11.- In which municipio was... living in 1970?

Municipio______________ State or country______________

12.- In which place was.... living when he/she was 12 years old? (In all cases write down; town, municipio, and state or country)

Town_________ Municipio_________ State or country_________

TO RESIDENTS AGED 6 AND ABOVE:

13.- Does.... know how to read and write?

01.- Yes 02.- No 99.- D.K.

14.- Which was the last grade and level of education that.... attended? (Grade or year, and Level)

Levels:

00.- Without education	01.- Kinder, pre-primary
02.- Primary	03.- Technician w/primary
04.- Secondary or equivalent	05.- Technician w/secondary
06.- High school or vocational	07.- Technn. w/high school
08.- Teaching school	09.- College
10.- Post graduate	99.- D.K.

15.- Is..... currently studying?

01.- Yes 02.- No (go to 18) 99.- D.K. (go to 18)

16.- What grade and level of education is .... currently in? (Grade or year, and Level) Levels as question 14.

17.- Where is..... currently studying?

01.- In this town 02.- Other town of this municipio

03.- Other municipio of this state 04.- Other state

05.- U.S.A. 06.- Other country 99.- D.K.

FOR MAN AND WOMAN AGED 12 AND ABOVE:

18.- Which is..... current marital status?

01.- Married 02.- Consensual union 03.- Divorced

04.- Separated 05.- Widow/er 06.- Single 99.- D.K.

19.- Has....... gone to work or in search of work into the U.S.A. within the last 5 years?

01.- Yes 02.- No 99.- D.K.

20.- Is...... an 'emigrado' (i.e. with legal permit/right to work)?
01.- Green-card holder 02.- American citizen
03.- No 99.- D.K.

TO ALL RESIDENTS OF THE HOUSEHOLD:

21.- Did.... sleep in the house all the nights during the last week (i.e. from Sunday to Saturday of last week)?
01.- No 02.- Yes (go to 26) 99.- D.K. (go to 26)

22.- How many nights did... sleep away from home during last week?

23.- And since when has.... been absent from the house? (Code and time)
01.- Days 02.- Months 03.- Years 99.- D.K.

24.- Where has......been during that time? (Code and name of the state when in other state of Mexico)
01.- This town 02.- Other town of this municipio
03.- Other municipio of this state 04.- Other state of Mexico
05.- U.S.A. 06.- Other country
07.- Other place (e.g. at sea) 99.- D.K.

25.- Why was... absent from the house?
01.- Working 02.- Searching for work 03.- Holidays
04.- Shopping 05.- Visiting 06.- Studying
07.- Other reason 08.- Medical care 99.- D.K.

26.- Did.... sleep in the house last-night?
01.- Yes 02.- No 99.- D.K.

FOR MAN AND WOMAN AGED 12 AND ABOVE:

27.- During last week did.... work at least one hour or one day to provide for the family or to cover his/her own expenses?
01.- Yes (go to 27.1) 02.- No 99.- D.K.

27.1.- How many hours per day did.... work?
(write down number of hours and go to 30)

28.- Then what is the main activity that... did during the last week?

01.- Employed but on holiday/leave (go to 29)
02.- Looking for work and has worked before (go to 33)
03.- Looking for work and has not worked before (go to 35)
04.- Studying (If man go to next person. If woman go to 36)
05.- House-keeping (as in 04)
06.- Retired (as in 04)
07.- Lives on own income - i.e. investments.(as in 04)
08.- Disabled (as in 04)
09.- Other (as in 04)
99.- D.K. (as in 04)

NOW I AM GOING TO ASK SOME QUESTIONS IN RELATION TO THE MAIN EMPLOYMENT THAT.... HAD DURING THE LAST WEEK:

29.- In his/her main job...... was he/she?

01.- Employer 02.- Sub-contractor 03.- Works on its own
04.- Member of a cooperative 05.- Salaried employee
06.- Works on commission or by piece-work
07.- Non-relative employee without salary
08.- Relative employee without salary
09.- Other 99.- D.K.

30.- Which is the name of the craft, profession, position, or appointment that... held in his/her job during the last week?

01.- Professionals and technicians
02.- Officials and directors within the public sector
03.- Officials, directors and proprietors in the private sector, other than in agriculture
04.- Administrators, managers and proprietors in agriculture
05.- Administrators, managers and proprietors in fisheries
06.- Direct workers (i.e. manual) and machine operators in agriculture
07.- Direct workers and machine operators in fisheries

08.- Direct workers and machine operators in manufacture
09.- Administrative personnel and similar occupations
10.- Sales-persons, merchants, and similar occupations
11.- Employees serving the public, or in personal services except domestic servants
12.- Employees in domestic service
13.- Transport equipment operators, except private chauffeurs
14.- Non-classified or insufficiently specified occupations
99.- D.K.

31.- What is the main business of the (factory, enterprise, institution, ranch) where... has his/her main/permanent job?
01. -Agriculture, cattle, forestry, hunting 02.-Fisheries
03.- Mining 04.- Transformation industry
05.- 'Maquiladora' 06.- Construction 07.- Electricity
08.- Commerce 09.- Transport 10.- Government
11.- Banking, insurance, real state 12.- Tourism
13.- Education services 14.- Domestic services
15.- Professional and technical services
16.- Other services
17.- Insufficiently specified activities 99.- D.K.

32.- In his/her main job, how often does.... receives his/her pay?
(Listen and classify the period, then ask) How much did he/she earn, or what is your estimate of his/her income?
(PERIOD, AMOUNT, AND CURRENCY - i.e. Mexican Pesos in thousands or American Dollars)
Periods:
01.- Daily 02.- Weekly 03.- Fortnightly
04.- Monthly 05.- By piece-work, service, or contract
99.- D.K.

33.- Did... work at any time during the last 12 months?
01.- Yes 02.- No (go to 35)

34.- How much time did.... work?
01.- 12 months 02.- from 6 to 11 months
03.- Less than 6 months 04.- Once in a while 99.- D.K.

35.- Where is the main job of... located (or where is he/she looking for a job?)
01.- In this town 02.- Other town of this municipio
03.- Other municipio of this state 04.- Other state
05.- U.S.A. 99.- D.K.

(WHEN YOU FINISH QUESTION 35; IF IT IS A MAN GO TO THE NEXT PERSON; IF IT IS A WOMAN GO TO 36)

ONLY FOR WOMEN AGED 12 AND ABOVE:
36.- NUMBER OF DAUGHTERS (FEMALES)
36.1.- How many daughters that were born alive has.....had during all her life (regardless of whether they are alive or not)?
Number_______
98.- None (go to 37.1) 99.- D.K. (go to 37.1)

36.2.- How many of those daughters are still alive?
Number_______
98.- None (go to 37.1) 99.- D.K. (go to 37.1)

36.3.- How many of those daughters that are still alive, live in the U.S.A?
Number_______ 98.- None 99.- D.K.

36.4.- How many of those daughters that are still alive, live in Baja California?
Number_______ 98.- None 99.- D.K.

37.- NUMBER OF SONS (MALES)
37.1.- How many sons that were born alive has....had during all her life (regardless of whether they are alive or not)?
Number_______
98.- None (go to 38) 99.- D.K. (go to 38)

37.2.- How many of those sons are still alive?

Number_______

98.- None (go to 38) 99.- D.K. (go to 38)

37.3.- How many of those sons that are still alive, live in the U.S.A?

Number_______ 98.- None 99.- D.K.

37.4.- How many of those sons that are still alive, live in Baja California?

Number_______ 98.- None 99.- D.K.

38.- LAST CHILD BORN

(ONLY FOR WOMEN WHO HAVE HAD AT LEAST ONE SON OR DAUGHTER. SEE QUESTIONS 36.1 & 37.1. FOR WOMEN WITHOUT CHILDREN GO TO 39)

38.1.- In which date was..........last child born?

Month_______ Year________

38.2.- Is that child still alive?

01.- Yes 02.- No (date of death) 99.- D.K.

(Code; if 2: month and year)

38.3.- Where did that last delivery take place?

01.- Social Assistance services

02.- Workers (other than public servants) Health services

03.- Public servants health services

04.- Other public employees health services (i.e. army)

05.- Public charity health services (i.e. Red Cross)

06.- Private hospital or clinic within Mexico

07.- In her house

08.- Private hospital or clinic in the U.S.A.

99.- D.K.

38.4.- Did... breast-feed her last child born alive?

01.- Yes 02.- No (go to 39) 99.- D.K. (go to 39)

38.5.- For how many months did... breast-feed the child?

Number_______ 98.- Still does 99.- D.K.

39.- CONTRACEPTION

ONLY FOR WOMEN 12 TO 49 YEARS OF AGE:

39.1.- Does..... or her partner currently do something to avoid having children?

01.- Yes 02.- Pregnant (go to next person or section)

03.- No (as in 02) 99.- D.K. (as in 02)

39.2.- What does.... or her partner do to avoid having children? (Write down the first three methods being mentioned. In questions 39.3 & 39.4 allude to the most effective)

01.- Female sterilization	02.- Vasectomy	
03.- Pills	04.- Injections	
05.- I.U.D.	06.- Foam, jelly	
07.- Condom	08.- Diaphragm	
09.- Rhythm	10.- Withdrawal	
11.- Other	12.- Abortion	99.- D.K.

39.3.- Since when has... been using (most effective method) without interruption (or when was she/he operated on)? (Month and year) 99.- D.K.

39.4.- Where did.... get (most effective method) when she/he began to use it (or where was...operated on)?

01.- Workers' (other than public servants) Health services
02.- 'Marginal' population special health services
03.- Federation public servants health services
04.- State public servants health services
05.- Social Assistance services (hospital or clinic)
06.- Social Assistance services (community services)
07.- Other governmental health services
08.- Midwife
09.- Private family planning program
10.- Chemist
11.- Private hospital, clinic, or consultant
12.- U.S.A.
13.- Other
99.- D.K.

B.2.5.- Section IV.

SECTION IV TEMPORARY INMIGRANTS.

1.- Is there any person which is not a member of this household but who has slept in this house one or more nights during last week (i.e. from Sunday to Saturday of last week)?

01.- Yes 02.- No (go to 2) 99.- D.K. (go to 2)

1.1.- How many persons (non-residents) slept here during last week? Number ____________

(Ask questions 4 to 15 in 'Last week' panel and then come back to question 2)

2.- And, did any person which is not a resident of the household sleep in the house last night?

01.- Yes 02.- No (go to next section)

99.- D.K. (go to next section)

2.1.- How many persons (non-residents) slept here last night? Number ____________

(Go to panel 'Last night' and ask questions 4 to 13)

FOR BOTH PANELS:

3.- Register Number

4.- Name?

5.- Relationship to the head of the household?

01.- Relative 02.- Friend, acquaintance

03.- Other non-relative 99.- D.K.

6.- Sex?

01.- Male 02.- Female

7.- How old is this person?

Number (in years)_________

8.- Why was.... present last night in the house?
01.- Work 02.- Looking for work
03.- Visiting (go to 10) 04.- Studying (go to 10)
05.- Other (go to 10) 99.- D.K. (go to 10)

9.- Where does... work (or is looking for a job)?
01.- Baja California 02.- U.S.A.
03.- Other state 99.- D.K.

10.- For how long has.... been present in the house?
(Code and number)
01.- Days 02.- Months 99.- D.K.

11.- Where does.... usually reside?
01.- This town 02.- Other town of this municipio
03.- Other municipio of the state 04.- Other state
05.- U.S.A. 06.- Other country 99.- D.K.
(If code 04; specify name of state)

ONLY FOR THOSE AGED 6 AND ABOVE:

12.- Does... know how to read and write?
01.- Yes 02.- No 99.- D.K.

ONLY FOR THOSE AGED 12 AND ABOVE:

13.- Which is..... marital status?
01.- Married 02.- Consensual union 03.- Divorced
04.- Separated 05.- Widow/er 06.- Single 99.- D.K.

ONLY FOR THOSE IN PANEL 'Last week':

14.- How many nights did.... sleep in the house during last week?
Number of nights ____________

15.- Did..... sleep in the house last night?
01.- Yes 02.- No 99.- D.K.

B.2.6.- Section V.

SECTION V DEATHS.

1.- Has any member of this household died during 1985 or 1986?

01.- Yes 02.- No (go to next section)

99.- D.K. (go to next section)

1.1.- How many persons died?

Number__________

Could you please give me some information about them?

2.- Register number

3.- Full name (forenames and surnames)?

4.- Sex?

01.- Male 02 Female

5.- Age (in years)?

6.- Date of death?

Month_______ Year________

7.- Where did he/she died?

01.- In this municipio 02.- In other municipio of the state

03.- In other state 04.- U.S.A. 99.- D.K.

B.2.7.- Section VI.

SECTION VI EMIGRATION.

1.- Now I would like to ask you whether or not a member of this household moved to another town during the last year? (do not forget servants, lodgers, and other non-relatives)

01.- Yes 02.- No (end of questionnaire)

99.- D.K. (end of questionnaire)

1.1.- How many persons moved?

Number__________

Could you please give me some information about them?

2.- Register number

3.- Name?

4.- Relationship to the head of the household?

01.- Spouse of the head
02.- Son/Daughter, or step children
03.- Son/Daughter in-law
04.- Grand-son/grand-daughter
05.- Father/mother, or in-laws
06.- Brother/Sister, or in-law
07.- Other relative (uncle, cousin, grandparent)
08.- Other non-relative (friends, god-father)
09.- Servant
10.- Lodger, guest
11.- Other
99.- D.K.

5.- Sex?

01.- Male 02.- Female

6.- Age (in years)?

7.- Current place of residence?

01.- Other town in this municipio
02.- Other municipio in this state
03.- Other state (specify)
04.- U.S.A.
05.- Other country
99.- D.K.

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