DIFFERENTIAL FERTILITY IN BANGLADESH

By

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A thesis submitted in partial fulfilment of the requirements for the degree of Master of Arts in Demography in the Australian National University

Canberra, May 1979

DEDICATED TO MY PARENTS

DECLARATION

EXCEPT WHERE OTHERWISE INDICATED,
THIS THESIS IS MY OWN WORK.

BASHIR-UD-DIN-AHMED
MAY 1979

ACKNOWLEDGEMENT

I take this opportunity to express my profound thanks to Dr S.K. Jain, my supervisor, who was so sincere and encouraging in providing guidance and assistance. I also wish to thank Dr P.F. McDonald, Dr D.W. Lucas and other staff of the Department of Demography, who spared some of their valuable time in discussing some of the problems and making comments on specific points.

I am thankful to Dr M.A. Satter, Secretary of the Ministry of Health and Population Control of the Government of Bangladesh, Dr A.R. Khan, National Director of the World Fertility Survey in Bangladesh, Professor L.H. Lewis, Resident Adviser of the World Fertility Survey in Bangladesh, who made data available for me to undertake this study. Thanks also to Professor J.C. Caldwell and Dr L.T. Ruzicka of the Department of Demography, the Australian National University, who corresponded the relevant authority in Bangladesh to get data tape.

My deepest gratitudes are due to Professor L.H. Lewis and Dr S. D'Souza who nominated me for a "Project Award" of the Australian Government. I wish to thank the Australian Government for offering me this Award.

I owe many thanks to Mrs P. Ashman for her secretarial assistance and to Mrs E. Oakman for her excellent typing of this thesis.

Finally, I gratefully acknowledge the company of my wife, Parvin, and the affection of our son, Rizwan, which made my stay in Australia so interesting.

ABSTRACT

This study of differential fertility is based on a subset of data obtained from the Bangladesh Fertility Survey (BFS) conducted in 1975-76 by the Ministry of Health, Population Control and Family Planning of the Government of Bangladesh under the auspices of the World Fertility Survey. The index of fertility used here is the mean number of children ever born to ever married women (aged 10-49) who were selected for the individual interview in the survey. The differentials in fertility are examined in terms of selected demographic, socio-economic, and cultural characteristics of the ever married women and their current/last husbands' socio-economic background.

The study has succeeded in dissecting the "high fertility segments" of the population and exploring some of the underlying causes and motives. It has also built up fertility models separately for the rural area, the urban area, and the country as a whole. Though the models are temporal and subjective, these can be used for disentangling a complex set of relationships that are at work in the population.

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INTRODUCTION

1.1 Socio Economic and Demographic Background of the Population

1.1.1 Geographical Setting

Bangladesh emerged as an independent nation in the year 1971. Before its independence it was East Pakistan, a part of Pakistan, and before August 14, 1947, it was a part of the Indian sub-continent ruled by the British for about two hundred years. It is surrounded by Indian territory on three sides except for a common border with Burma on the south-east. To the south of the country is the Bay of Bengal. Situated on the delta of the Ganges, Brahmaputra, and Meghna rivers, Bangladesh is characterised by high temperatures, heavy rainfall, and excessive humidity. With the exception of the hilly areas in the south-east and the north-east, most of the country is less than fifty feet above sea level (Ahmad, 1968).

1.1.2 Population Size and Density

The population of Bangladesh remained fairly stable at about 17 million during the eighteenth century (Mosley and Hossain, 1973:8). Thereafter, it started growing slowly to about 29 million in 1901 and 42 million in 1951 (Bangladesh, 1977:8). The growth rate has increased tremendously since 1951, and the 1974 Census estimated, as on 1st March 1974, a population of 76.4 million. With this population in an area of 55,126 square miles, Bangladesh is among the most crowded countries of the world. The implication of such a high density (about 1386 persons per square mile) of population is apparent when one considers that: "For every person depending almost exclusively on land as a source of income (i.e., for each member of the farming families), the available cultivable acreage is only 0.445 on the average" (Khan, 1972:10). This means that an average family of five persons has to support a living from a farm of just over two acres only. The dependency ratio which increased from ninety eight in 1961 to one hundred and six in 1974 also reveals the gravity of the situation.

1.1.3 Religious Communities

Religion plays an important role in the day to day life of the people of Bangladesh. The major religious community is formed by the Muslims (about 85 per cent) with the Hindus comprising about 14 per cent (Bangladesh, 1977:23). The other religious groups which constitute only 1 per cent of the total population are the Christians, Buddhists and some tribes. The Muslim community has largely accounted for the overall growth of population in the past decades partly due to its predominance in the area and partly due to the migration of a large number of Muslims from India. Always guided by the religious doctrines and moral codes, the Muslims believe that man and woman should surrender to the will of God as He determines the number of babies to be born to them and provides food for all the mouths in the family. If there are disasters like cyclones, tidal bores, devastating floods, famines, and epidemics, they take it as the will of God and also as a punishment for not performing religious activities (Zaidi, 1970). The teachings of Hindus also have a pro-natalist orientation on the whole (Prabhu, 1958).

1.1.4 Literacy and Education

The change in the concept of literacy in the various censuses undertaken in the area now constituting Bangladesh make it hardly possible to compare the levels at various points of time in the past. The data available from the last two censuses of 1961 and 1974, however, conform to the definition of literacy adopted by the United Nations. Though literacy has increased from about 20 per cent in 1961 to about 24 per cent in 1974 (Bangladesh, 1977:27), it appears that a great majority of the people are living in the realm of unlettered darkness. The gravity of the situation can be visualised by the fact that 69 per cent of the males and 93 per cent of the females in the age group of thirty five years and over did not possess a single year of formal education in 1974 (Bangladesh, 1977:30). Given the economic constraints and demographic prospects, it seems that Bangladesh will find it impossible to provide universal high quality education in the near future.

1.1.5 Marriage Patterns

That marriage is almost universal in Bangladesh is evident from the proportions of males and females reported "never married" at ages 45-49 in all censuses and surveys. The percentages of males and

females reported to be never married in the age group 45-49 in the 1951 census were as low as 1.3 and 0.2 respectively (Bangladesh, 1977:19). These percentages experienced a further decline to 0.8 and 0.1 respectively in 1961. The 1974 census, on the other hand, showed an increase to 1.1 and 0.3 per cent. It suggests that no significant change in the overall practice of marriage has occurred since 1951. Marriage is not only universal in Bangladesh, it takes place at an early age too. Female age at marriage (singulate mean age at marriage) as estimated from the 1974 Census data is not more than sixteen years. Males, on the average, marry at a higher age but not later than twenty four years (Bangladesh, 1977:19).

The social and religious attitudes attached to the importance of marriage are primarily responsible for the practice of nearly universal marriage and the low age at marriage. According to Samuel (1965:6), "The Hindu scriptures urged the parents to give away their daughter in marriage while she goes still naked and warned not to keep the maiden in their home after she has attained puberty". Though no age limits have been fixed by Islam for marriage, Muslims also place high value on the unmarried girl's virginity. Girls who attain puberty are, therefore, objects of great anxiety and care in the eyes of their parents even today. With regard to the selection of partner, the choice is left to the parents. They arrange the marriages of their children as a part of their moral and religious obligations and fix up the amount and nature of dowry in this connection.

1.1.6 Urbanisation

Bangladesh is predominantly a rural country. Although there are some discrepancies in the definition of urban areas in various censuses, the country has not experienced any substantial change in urbanisation since the turn of the century. In 1901, the urban population constituted 2.4 per cent of the total. After an elapse of more than seven decades the rate has increased to only 8.8 per cent in 1974 (Bangladesh, 1977:14). This low level of urbanisation undoubtedly indicates that Bangladesh was not susceptible to rapid urbanisation and modernisation during this period.

1.1.7 Labour Force

In Bangladesh the percentage of economically active population is quite low and the percentage of the total population in the labour force has decreased from 34 per cent in 1961 to 29 per cent in 1974 (Bangladesh, 1977:35). Women constituted only about 9 per cent of the total nonagricultural labour force in 1961 and this also decreased to about 5 per cent in 1974 (Bangladesh, 1977:40). The social customs that prescribe that females should not be sent for outside work as well as the lack of suitable employment opportunities may be held responsible for their low participation rate in non-agricultural sector. So, until and unless females are at least educated and the social and cultural taboos on their economic activities are removed, it appears unlikely that this situation will dramatically change.

1.1.8 The Economic Condition

At its independence Bangladesh inherited a largely static and traditional rural economy with a small industrial base. The production of two main crops, rice and jute, which determine the fate of the vast majority of the people is always dependent on the environmental conditions. Floods, droughts and cyclones, often accompanied by tidal bores have been a major cause of severe crop damage and consequent local famine. Even in the period of good harvest the food supply has been barely adequate for the needs of the population. The simple explanation for this chronic state of food shortage is that production never catches up with demand as the population has been growing at a rate of about 3 per cent per year. Khan (1972:25-27) has given an estimate of the extremely low level of consumption of goods and services by the "average" people of Bangladesh. According to him, "... nearly half the population are on a starvation diet, nearly 90 per cent have some kind of deficiency in food, and that a vast majority are ill-clad and nearly shelterless". Although there was some progress in the modern sector, the traditional small-scale and cottage industries of Bangladesh declined during its two and a half decades of union with Pakistan (Khan, 1972).

1.1.9 Birth and Death Rates

Like many other developing countries, Bangladesh does not have and cannot afford to maintain either a nationwide vital registration system or a population register that can provide basic and detailed fertility and mortality data at any point of time. Birth and death rates have therefore been estimated from data obtained in population censuses and specially designed sample surveys. One exception is the Demographic Surveillance System (DSS) in Matlab thana of Comilla district, instituted by the former Cholera Research Laboratory (CRL) in Bangladesh. Under this system, the registration of births, deaths and migration has been in operation since 1966 and, of marriages and divorces since 1975 (Ruzicka and Chowdhury, 1978).

The crude rates of birth, death and natural increase in Bangladesh as obtained from different sources during the period 1961-74, do not show a consistent declining trend (Table 1.1). Though the estimates were obtained from different sources by different techniques and hence not strictly comparable, they do indicate that both the levels of fertility and mortality in Bangladesh are fairly high. Khan (1973) has estimated that the crude death rate had experienced a sharp decline from a level of 46 per 1000 to a level of 20 per 1000 during the period 1901-65. The crude birth rate, on the other hand, remained stable at a high level of around 50 per 1000 during the same period.

1.2 Importance of the Study

The alarming rate of growth of population in Bangladesh has been posing a serious threat to its social and economic development. The Government of Bangladesh recognises that if the present rate of population growth is sustained, then all the development efforts will be frustrated, aggravating the already unfavourable economic condition. It is also recognised that high fertility, one of the key components of population growth is mainly responsible for this high rate of growth.

Does this high fertility norm vary from one socio-economic stratum to another? The study of differential fertility can identify the "high fertility segments" of the population and the underlying causes and motives. This can then be utilised for building up causal models as well as assessing future composition and characteristics of the

population. Countries like Bangladesh, planning to solve their population problems through the "multisectoral approach", will require information from this type of research for policy formulations.

TABLE 1.1

Crude Rates of Birth, Death and Natural Increase in Bangladesh: 1961-74

Source	Year	Crude birth rate (per 1000)	Crude death rate (per 1000)	Crude rate of natural increase (per cent)
Obaidullah[a]	1961-62	46.5(R) 49.7(U)	20.0(R) 18.7(U)	2.7(R) 3.1(U)
Farooqui and Farooq[b]	1962-65	53.0(CD)	20.0(CD)	3.3(CD)
Chowdhury *et al.*[c]	1966-67	47.1	15.0	3.2
Sirageldin *et al.*[d]	1968-69	42.0	-	-
United Kingdom[e]	1974	48.0	20.0	2.8
Rabbani *et al.*[f]	1974	47.4	19.4	2.8

NOTE: R=Rural U=Urban CD=Chandrasekar-Deming

[a] Obaidullah, M. 1966 "On Marriage, Fertility and Mortality" in *Demographic Survey in East Pakistan, 1961-62.* Part Two, Chapter Two. Dacca: Institute of Statistical Research and Training.

[b] Farooqui, M.N.I. and G.M. Farooq 1971 *Final Report of the Population Growth Estimation Experiment, 1962-65.* Dacca: Pakistan Institute of Development Economics.

[c] Chowdhury, A.K.M.A. *et al.* 1969 *Demographic Studies in Rural East Pakistan.* Second Year: May 1967-April 1968. Dacca: Pakistan-SEATO Cholera Research Laboratory

[d] Sirageldin, I. *et al.* 1975 "Fertility in Bangladesh: Facts and Fancies". *Population Studies* 29(2):207-215.

[e] United Kingdom, Ministry of Overseas Development 1977 *Report on the 1974 Bangladesh Retrospective Survey of Fertility and Mortality.* London and Dacca.

[f] Rabbani, A.K.M.G. *et al.* 1976 "1974 Census Estimates of Fertility Levels in Bangladesh", a paper presented to the Cox's Bazar Seminar sponsored by the Bangladesh Fertility Survey. Dacca, December.

1.3 Purpose and Scope of the Present Study

The purpose of this study is to fill in the gaps of differential fertility analysis of Bangladeshi women. With this end in view it will make an attempt:

i) to determine whether the number of children ever born (fertility) varies among women who are differentiated: by the current place of residence, childhood place of residence, religious affiliation, working status, economic status, and educational achievement and by the childhood place of residence, type of occupation, and educational achievement of their husbands;

ii) to learn whether the differences or similarities among subgroups in fertility are related to their age distributions and duration of marriage;

iii) to investigate how fertility varies by marital status and number of times married;

iv) to determine whether there is any connection between the fertility of subgroups in each social category and the ages at which their women marry; and

v) to build up a fertility model by taking the number of children ever born as a dependent variable and all other selected demographic, socio-economic, and cultural characteristics as explanatory variables.

1.4 Data Source

This study of differential fertility is based on the primary analysis of a subset of data obtained from the Bangladesh Fertility Survey (henceforth called the BFS) conducted in 1975-76 by the Ministry of Health, Population Control and Family Planning of the Government of Bangladesh in collaboration with the International Statistical Institute, the Hague. While the methodology of the survey is briefly discussed in Section 1.6, the data subset used for this analysis is given in Appendix A. In establishing comparability, data from several other studies are used.

1.5 Review of Relevant Studies

Numerous studies were conducted almost all over the world to find differentials in fertility by socio-economic status. In this section, only some of the studies conducted in Bangladesh will be reviewed briefly. The findings of these studies inside and outside the country will be referred to in the appropriate places in the text of this thesis.

The first demographic survey in Bangladesh was undertaken in 1961-62 under the auspices of the Institute of Statistical Research and Training, the University of Dacca. Using data from this survey, Obaidullah (1966) made an attempt to examine the fertility differentials by place of residence, religion, and occupation of husband in urban area. The findings of this study were limited, however, by the smallness of the sample size and the limited coverage as the data were collected only for four (out of 17) districts, Dacca, Faridpur, Comilla and a small portion of the southern part of former Mymensingh, which comprise roughly the central region of the country. Moreover, the quality of the data especially the pregnancy history information might have been impaired because such data were collected by male investigators.

Badrud Duza (1967) endeavoured to find fertility differentials by demographic, and socio-economic status of the women of Bangladesh. He used 1961 Census data and took the child-woman ratio and child-married woman ratio as the indices of fertility and marital fertility respectively.

Stoeckel and Choudhury (1969) studied the differentials in fertility in a rural area of Bangladesh. They used data from a survey conducted in 1967 under the auspices of the Pakistan Academy for Rural Development. The study area covered fifteen villages of Comilla-Kotwali thana. The hypotheses concerning the relation between female marital fertility and socio-economic status (occupation, education, and landholding of husband), religious affiliation, family type and age at marriage of wife were tested.

The former Cholera Research Laboratory (CRL) in Bangladesh had instituted a continuous Demographic Surveillance System (DSS) in Matlab thana of Comilla district, situated 45 km south-east of Dacca, the national capital. In addition to its longitudinal registration of births, deaths, migration and marriages, there had been intervening

censuses in 1966, 1968, 1970 and 1974 which provided data of very high quality. These data, though not nationally representative, present the current levels and past trends in fertility of rural women by demographic and socio-economic status since 1966.

A retrospective survey of fertility and mortality was conducted in Bangladesh in 1974 by the Census Commission with technical assistance from the Population Bureau of the Ministry of Overseas Development, the Government of the United Kingdom (United Kingdom, 1977). The main objective of this survey was to arrive at reliable national estimates of fertility and mortality through indirect techniques rather than to investigate the social and economic factors underlying these levels. The final report of this survey, however, has presented differentials in fertility by marital status, education, religion and caste status, type of house, urban-rural place of residence, and administrative district.

A socio-economic survey of working versus non-working women of Dacca City, the capital of Bangladesh, was conducted in 1974 by the Bangladesh Institute of Development Studies (BIDS). The study was delimited to those women who were currently married, living with their husbands, and reported to be fecund. Using data from this survey, Chaudhury (1978) investigated the relationship between female status (measured by education, work experience, and conjugal role relationship) and fertility (measured by the number of children ever born) and the use of contraception.

1.6 Methodology of the BFS and Reliability of the Data

1.6.1 Methodology of the BFS

The Bangladesh Fertility Survey was undertaken under the auspices of the World Fertility Survey. The specific aims and objectives, and methodology of the survey have been discussed at length in the Country Report (Bangladesh, n.d.). Nevertheless, it is pertinent to discuss here in brief some of the issues, because, the accuracy and efficiency of the findings of a survey vary with the sample design, sample size, criteria for selection of the respondents, and the quality of the data.

The Sample Design: The sample design of the BFS involved a three-stage sample of households in urban and rural areas of Bangladesh. In the first two stages area selection was done with probability proportional to size (PPS) and in the last stage households were selected with probability inversely proportional to the measure of size (Bangladesh, n.d.). The sample was drawn independently for the rural and urban strata and the selection procedure made the sample self-weighted within each stratum. The number of households selected for interview was 6145, out of which 4626 households came from the rural area, and 1519 from the urban area. However 4437 households were successfully interviewed in the rural area and 1418 in the urban area. The distributions of the 240 sample villages/ blocks (160 for rural, 80 for urban) from which the households were selected are shown in the following map (Figure 1.1).

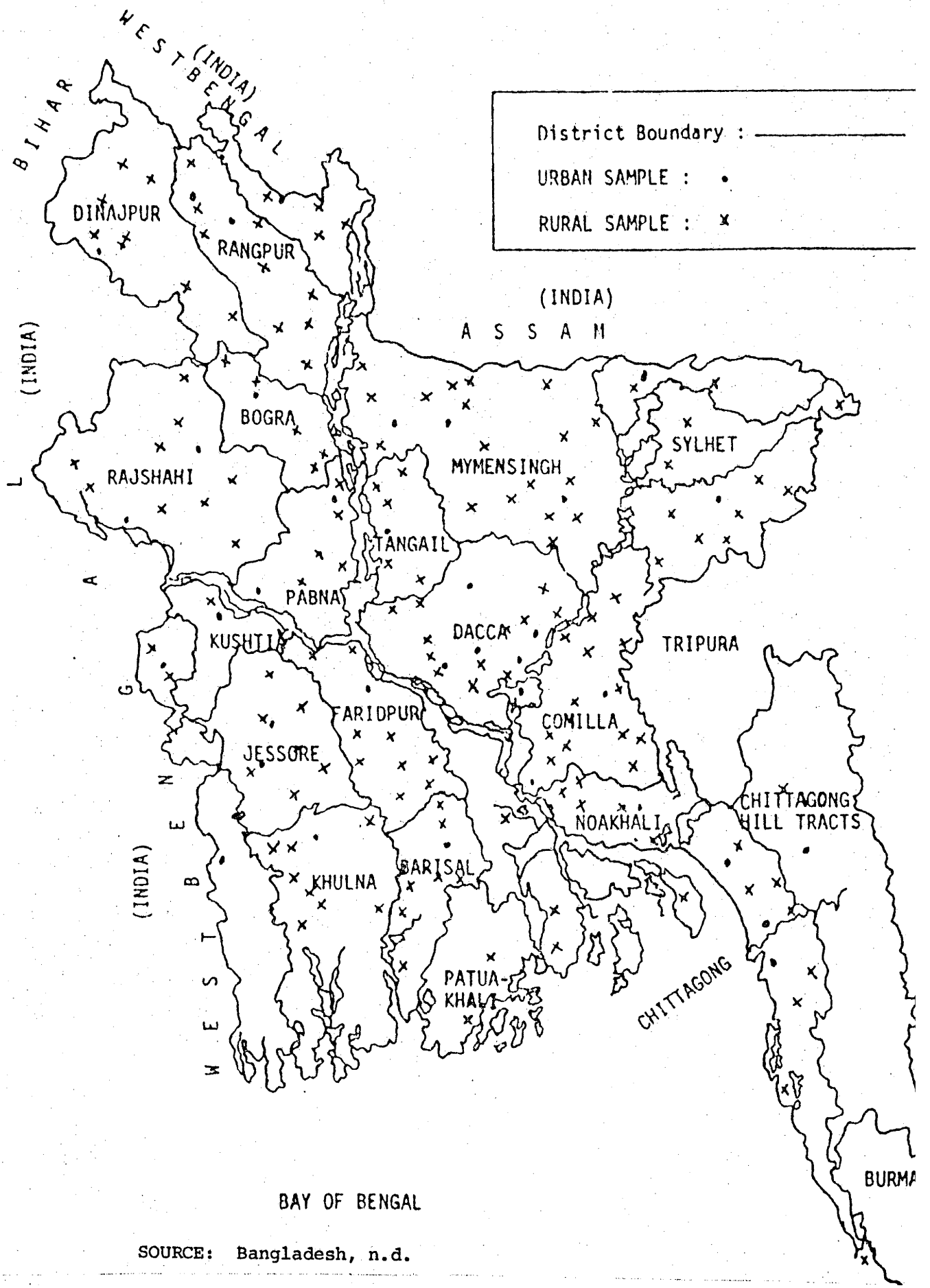
Selection of Eligible Respondents: After the household interview, ever married women who were below fifty years of age and who slept in the household the night preceding the interview were selected as eligible respondents for individual interview. The female members of a household who did not sleep there the night preceding the household interview were not eligible for individual interview whereas the women visitors who slept at that household the night preceding the day of interview were eligible. Thus the individual survey was conducted on a de-facto basis and not on a de-jure basis. This was done on the assumption that the number of absentee women and the number of visiting women would neutralise each other. In all, 6648 women, out of whom 5123 came from rural areas and 1525 from urban areas, were identified as eligible respondents. Of these, 5024 women were successfully interviewed in the rural area and 1489 women in the urban area giving an overall response rate of 98 per cent.

1.6.2 The Data Obtained for Fertility Study

The pregnancy history section of the individual questionnaire was specially designed for obtaining data on fertility. In this section detailed history of all pregnancies of a woman starting from the first pregnancy and ending in the most recent, was recorded. Using this information, one can estimate different indices of fertility at the time of the survey as well as at different points of time before the survey.

FIGURE 1.1

Bangladesh Fertility Survey: Scatter of Sample Points



SOURCE: Bangladesh, n.d.

In addition, one can also make use of the age-sex data and the own children data of the household schedule to estimate fertility. There was no direct question as to the number of births occurred in the household during the twelve months preceding the survey date.

For the analysis of fertility in this thesis, only the "Children Ever-Born" data summarised from the pregnancy history of ever married women would be taken into account. The socio-economic variables which would be related to the mean number of children ever born are taken from the following sections of the BFS questionnaire: Section 1 - Respondent's Background; Section 2 - Marriage History; Section 6 - Work History; Section 7 - Present (Last) Husband's Background; and Section 9 - Assets and Expenditure.

1.6.3 Evaluation of Data

The quality of data obtained by a sample survey is a function of the accuracy with which the entire survey operation is carried out. In practice, it is very difficult to establish this relationship empirically and identify the relative importance of each factor responsible for high quality of data. Survey operators are therefore left with their own choice and judgment which is usually influenced by their experience and knowledge of previous surveys undertaken in the country concerned. While conducting the survey they take adequate measures to minimise the errors which affect the population estimates. The sources of errors except for the sampling error have been summarised by Cochran (1962:292) as given below:

i) Failure to measure some of the units in the chosen sample. This may occur in human population because of failure to locate some units or their refusal to answer the questions when located.

ii) Errors of measurement on a unit. This may happen due to the misreporting of events and dates by the respondents and/or misinterpretation of events by the interviewers.

iii) Errors introduced in coding, editing, and tabulation of the results.

To reduce the errors introduced by (i) and (iii) mentioned above, the BFS field staff, coders, and editors were specially trained.

Some of the refusal and deferred cases of individual interviews were later successfully dealt with during the Post Enumeration Survey (Bangladesh, n.d.). The second kind of error depends on the inability and inefficiency of the interviewers to interview as well as the misreporting of events and dates by the respondents. In a traditional society like Bangladesh, where the population is characterised by widespread illiteracy, it is very difficult to obtain even approximately correct statements. The efficiency of the interviewers is therefore a prominent factor in obtaining data of good quality. The BFS interviewers were highly educated, well-paid, well-trained, and well-equipped for the field operation. The entire network of data collection was well-organised and well-done. So, one can expect that the errors in reporting were largely due to the respondents.

1.7 Analysis

It is evident from an earlier section (section 1.6.1) that the percentage of urban women (about 23 per cent) in the sample is about two and a half times greater than the percentage of urban population in the whole country (about 8.8 per cent). The urban women were purposely oversampled so that separate analysis for urban women could be carried out. Appropriate weighting factors for the two different strata have been estimated and given in the Country Report so that any analysis at the national level can be performed (Bangladesh, n.d.). In this thesis, rural and urban areas have been taken separately unless otherwise stated. All tables, with certain specified exceptions are based on the original analysis of BFS data.

The discussion of findings begins with a brief description of the socio-economic characteristics of the respondents. The term "marital duration" refers to years since first marriage by taking into consideration the marital dissolution, remarriage, etc., that had happened since that initial event. The estimation procedure of marital duration of all ever married women in the sample is given in Appendix B.

The technique of direct standardisation is applied althrough in the relevant places. The marginal distributions of the weighted national sample of women (respondents) by age and duration of marriage (given in Appendix B) are taken as the standard populations unless otherwise stated.

The analytical technique of the causal model (Path Analysis) is described in the appropriate place (Chapter 4).

1.8 Organisation of the Present Thesis

There are four more chapters in this thesis. While Chapter 2 presents the differentials in fertility by socio-economic status, Chapter 3 presents the same by marital status, and age at marriage. Chapter 4 attempts to build up a causal model (Path Analysis) and Chapter 5 draws the summary and conclusion.

CHAPTER 2

SOCIO-ECONOMIC DIFFERENTIALS IN FERTILITY

2.1 Socio-Economic Characteristics of the Respondents

2.1.1 Rural-Urban Place of Residence

Since the country was divided into two strata, rural and urban, respondents can be easily identified for rural-urban comparison with regard to their fertility behaviour and other socio-economic characteristics. In addition, the information collected on their childhood place of residence and the childhood place of residence of their husbands can also be employed for the same purpose. The selection of the variable "childhood place of residence" stems from the hypothesis that people who grow up in the countryside, small towns, or cities would be exposed to different values, norms, and socialisation experiences, which in turn could affect their fertility behaviour.

Of the total respondents, 5024 were found to live in rural area and 1489 in urban area (Table 2.1). Almost all of those (98 per cent) who lived in the rural area had a rural background in terms of their childhood place of residence, whereas about two-thirds of those who lived in the urban area had a rural background. This observation is important in studying the differentials in fertility by urban and rural place of residence. When asked about the childhood place of their current or last husbands, about 99 per cent of the respondents in the rural stratum and 73 per cent in the urban stratum reported that their husbands' childhood place of residence was rural areas.

2.1.2 Religion

Most respondents either from rural or urban areas were Muslims. Their proportions (83 per cent in the rural and 85 per cent in the urban area) were very close to the corresponding proportions of Muslim population in the whole country. The non-Muslim category consisted of Hindus, Christians, Buddhists and other religious groups, the major group being formed by the Hindus in both the strata.

2.1.3 Education

Education here refers to the highest level passed by the respondents and their husbands. Less than 1 per cent of respondents or their husbands had attended *madrasha* (religious schools). So the possible positive effect on fertility of koranic schooling could not be tested. As expected, the marjority of respondents, particularly in the rural area, were uneducated. Urban respondents were more likely to have secondary education than rural respondents, but in both areas husbands were, on average, better educated than their wives.

2.1.4 Working Status of Respondents

In the work-history section of the BFS questionnaire, respondents were asked to report whether they were working in addition to doing their household work for cash or kind. Those who answered "yes" were subsequently asked to report about the type of work they were doing. And those who answered "no" were asked whether they had ever worked since marriage and if "yes" to report the type of work. From this information the respondents have been classified into two broad categories, non-working and working. The former category includes those who had never worked after marriage whereas the latter category includes those who were currently working at the time of the survey and those who had ever worked before the survey. It is pertinent to investigate whether a woman had ever worked after marriage and whether her work had any depressing effect on the fertility. Women who worked sometime between marriage and the time of the survey are therefore included in the working group as it appears in Table 2.1 and other relevant tables.

It is evident from Table 2.1 that 87 per cent of the respondents in the rural area and 84 per cent in the urban area did not work aside from doing household activities for cash or kind. Those who were currently working or had worked sometime between marriage and the time of the survey were mainly working as maids, domestic servants, spinners, weavers, feed and beverage processors and related workers, and labourers.

2.1.5 Occupation of Husbands

Respondents were asked to report the type of work their husbands were doing at the time of the survey or before the survey. If the husband was unemployed or retired, the respondent was asked

to report the last occupation. Since the question on occupation was an open-ended one, detailed coding was necessary and proper care was taken to do so. Even then, the occupations of 848 husbands could not be properly classified and they have been taken in this thesis as the "unclassified" group due to its large size. This group comprises mainly labourers not elsewhere classified, new workers seeking employment, and workers not reporting any occupations. The size of this group might have been enlarged due to the misreporting of occupations by the respondents, and due to the ambiguous type of work reported.

The occupations of the remaining husbands have been divided into four groups: (1) landless agricultural; (2) production and related; (3) agricultural-own land; and (4) white-collar. The first group comprises of: (i) landless agricultural labourers; and (ii) animal husbandry and forestry workers, fishermen and hunters. The second group includes: (i) production and related workers; and (ii) transport equipment operators. The third group consists of: (i) cultivators tilling their own land; (ii) cultivators tilling their own land and also share cropper; and (iii) cultivators who are only share croppers. The last group includes: (i) professional, technical and related workers; (ii) administrative, executive and managerial workers; (iii) clerical and related workers; (iv) sales workers; and (v) service workers.

2.1.6 Economic Status

There was no direct question on family income in the BFS questionnaire. An attempt has therefore been made here to measure the family's economic position from data on the family's holdings of selected assets. From Section 9 of the BFS questionnaire, data on the holdings of the following items: radio, boat, tea set, car, iron, television, bicycle, refrigerator, watch/clock, motor bicycle, sewing machine, and bedstead, are taken to create a measure of economic status. Women in households having none of these assets would belong to one group called "poor" and women having at least one of these assets would belong to another group called "rich". Though this scale of measurement of the economic status is not absolutely correct and scientific, it will at least serve the present purpose and throw some guidelines for the future analysis of economic data for understanding fertility behaviour.

TABLE 2.1

Socio-economic Characteristics of the Respondents by Rural-Urban Place of Residence: BFS, 1976

Socio-economic characteristics	RURAL		URBAN	
	Number	Per cent	Number	Per cent
All	5024	100.0	1489	100.0
Childhood place of wife: rural	4937	98.3	995	66.9
urban	84	1.7	492	33.1
Childhood place of husband:				
rural	4909	98.7	1047	72.5
urban	64	1.3	398	27.5
Religion : Muslim	4164	82.9	1263	84.8
non-Muslim	858	17.1	226	15.2
Education of wife: no education	3972	79.4	897	60.4
primary	878	17.6	341	23.0
secondary or more	152	3.0	247	16.6
Education of husband:				
no education	2910	59.0	583	40.3
primary	1139	23.1	309	21.4
Secondary or more	882	17.9	554	38.3
Working status of wife:				
non-working	4357	86.8	1245	83.8
working	665	13.2	241	16.2
Occupation of husband:				
unclassified	636	12.7	212	14.6
landless agricultural	761	15.2	63	4.3
production and related	449	9.0	308	21.2
agricultural (own land)	2329	46.5	141	9.7
white-collar	830	16.6	726	50.1
Economic status: poor	3588	71.4	751	50.4
rich	1436	28.6	738	49.6

NOTE: The subtotals may not add up to the total because of the deletion of missing (not stated, etc.) cases.

It appears from the BFS data that 71 per cent of the respondents in the rural area do not possess a single asset while 29 per cent have at least one of the assets (Table 2.1). In the urban area, on the other hand, the percentage of respondents possessing at least one of the household assets is 50, and that of respondents having none of these assets is also 50. That the percentage of poor women in the urban area is less than that in the rural area does not necessarily mean that urban women are always better-off than their rural sisters. The difference might have arisen partly due to the differential selection of women in the rural and urban areas and partly due to the criteria on which the index of economic status is based.

2.2 Socio-Economic Status and Fertility

2.2.1 Rural-Urban Place of Residence and Fertility

The literature on rural-urban place of residence and fertility often advocates that there is a substantial difference between rural and urban fertility and that fertility is higher in rural than in urban populations, and is smaller than in larger urban communities. Spengler (1952:102-103) explains:

> Urbanization (or deruralization) concomitant of output-increasing industrialization, has been unfavorable to fertility, presumably because there has been associated with progress in urbanization an intensification of more elements (e.g., level and content of aspirations, relative net cost of rearing children) that are or can become inimical to childbearing and childrearing than of elements that are favorable (e.g., better medical care).

While describing the factors responsible for differences between rural and urban fertility, Landis (1943:101) says:

> ... the urban family has become rather highly individualized, unstable, and pleasure-motivated rather than progeny-motivated, whereas in more isolated rural cultures, where primary group restraints are characteristic, where individual behavior is under the close surveillance of neighbors and friends, and where even the courtship and mate selection of youth has some guidance by the elders, the family still maintains many of its important functions as a social

> institution, being primarily concerned with family and community welfare than with pleasure considerations of the individual.

In fact if the urban culture is different from the rural culture, the value systems are quite different in these two areas, people living in urban areas are progress-minded and those living in rural areas are fatalistic, access to birth-control devices and practice of abortion are easier in urban than in rural areas, urban fertility will tend to become lower than rural one.

The existence of a rural-urban fertility differential has been well-established in the European nations and in those nations whose population is predominantly European descent (Jaffe, 1942). Several studies were conducted in India, Pakistan and Bangladesh to examine rural-urban fertility differentials, but the results were mostly conflicting and the differences observed were very small. Davis (1951), by using the child-woman ratio as an index of fertility, found significant differences between rural and urban fertility, the former being higher than the latter, in the Indian sub-continent. His findings suggest a fertility differential not only between rural and urban areas but also between larger and smaller cities. Ahmed (1962), in contrast, observed a positive correlation between urbanisation and both the child-woman ratio and the child-married woman ratio in Pakistan. Badrud Duza's (1967) study, based on the 1961 Census data of Pakistan, supports the findings of Davis (1951) on the point that when fertility is measured by the child-woman ratio, there is a negative association between urbanisation and fertility in Pakistan and Bangladesh. He was critical of Ahmed's hypothesis regarding a positive correlation between "urbanity" and fertility, because it was based on the grossly incorrect age data of the 1951 Census. Robinson's (1961) analysis, however, suggests that the rural-urban fertility differential which becomes apparent by employing fertility ratios, is spurious and that 40 to 50 per cent of the differences in India can be explained by differential infant and childhood mortality alone.

There is no difference between rural and urban marital fertility in Bangladesh (Table 2.2). The age pattern shows that the rural women had about 0.2 of a child more than the urban women in all

age groups except the group 10-19. The lower mean parity of rural women in this age group may result from omission of live births who died immediately after birth and were misreported as still births. This sort of omission of live births is not unlikely in Bangladesh, especially in rural areas where most of the deliveries are not attended by doctors and where midwives are not trained enough to distinguish between live births and still births. In the urban area, most births take place either in hospitals or in private clinics attended by doctors and/or nurses. So, there is less chance of misreporting of live births as still births. If fertility under-reporting of rural women occurred in all age groups, not just the youngest (as postulated), then average rural fertility could well exceed urban to a more noticeable extent than appears in Table 2.2.

TABLE 2.2

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, by Current Age and Rural-Urban Place of Residence: BFS, 1976

Current age	Rural		Urban	
10-19	0.62	(1071)	0.78	(267)
20-29	3.13	(1893)	2.91	(622)
30-39	6.05	(1142)	5.85	(354)
40-49	6.94	(918)	6.74	(246)
Observed mean	3.96	(5024)	3.86	(1489)
Standardised mean	3.96		3.82	

NOTE: The standard population is the weighted national sample of respondents (ever married women aged 10-49) by age.

After standardising for age, the difference between the overall rural and urban parity becomes only 0.2, the rural parity being 4.0 and the urban parity, 3.8. After standardisation for duration of marriage, the difference remains the same, but in the opposite direction (Table 2.3).

TABLE 2.3

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, by Duration of Marriage and Rural-Urban Place of Residence: BFS, 1976

Duration of marriage	Rural		Urban	
< 10	1.11	(1735)	1.47	(587)
10-19	4.07	(1640)	4.31	(505)
20 +	6.84	(1649)	6.84	(397)
Observed mean	3.96	(5024)	3.86	(1489)
Standardised mean	3.93		4.14	

NOTE: The standard population is the weighted national sample of respondents (ever married women aged 10-49) by duration of marriage.

This is because of the fact that the mean parity of urban women is either equal to or greater than that of rural women at each duration of marriage and because the distributions by duration of marriage are different. Here again, the highest difference arises in the shorter duration of marriage, which might indicate better reporting of live births by the urban young women who are more educated than their rural sisters. Otherwise, urban young women may be more fertile than rural young women who are perhaps subject to malnutrition or dietary habits.

After standardising for duration of marriage, the mean parity of urban women with urban childhood background becomes greater than that of rural women with rural childhood background, though the difference is only 0.2 of a child (Table 2.4). Also in the rural area, women with urban childhood background show higher mean parity than women with rural childhood background. The difference between the mean parity of urban women with rural and urban childhood background is negligible.

TABLE 2.4

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, by Duration of Marriage and Childhood Place of Wife: BFS, 1976

Duration of marriage	Current place of residence	Childhood place of wife: Rural		Childhood place of wife: Urban	
< 10	Rural	1.10	(1695)	1.56	(39)
	Urban	1.52	(351)	1.39	(236)
10-19	Rural	4.06	(1618)	4.55	(22)
	Urban	4.30	(352)	4.34	(151)
20 +	Rural	6.83	(1624)	7.13	(23)
	Urban	6.84	(292)	6.83	(105)
Observed mean	Rural	3.96	(4937)	3.87	(84)
	Urban	4.07	(995)	3.46	(492)
Standardised mean	Rural	3.92		4.34	
	Urban	4.15		4.11	

When the mean parity of urban women with husbands having urban childhood background is compared with that of rural women with husbands having rural childhood background, urban fertility becomes consistently higher than rural fertility at each duration of marriage (Table 2.5). A similar pattern is apparent when the mean parity of urban women with husbands having urban childhood background is compared with that of urban women with husbands having rural childhood background. But the overall mean parity is greater for the latter group in both the comparisons. The standardised mean parity, on the contrary, becomes higher for the former group in each of the above comparisons.

A further comparison between the mean parity of rural women having rural childhood background of themselves and their husbands (3.93 in Table 2.6), and the mean parity of urban women having urban childhood background of themselves and their husbands (4.18 in Table 2.7), shows that urban fertility becomes higher than rural

fertility after controlling for duration of marriage. Thus, from the above findings, it seems that the urban childhood place of residence, whether of the husband or of the wife, does not act in part or in combination to depress fertility if the duration of marriage is controlled. Rather, it tends to increase the fertility of ever married women. Why does it operate on fertility positively? Perhaps better health and nutrition accrued from better food, better housing and sanitation, and better medical facilities in the urban area are responsible for this. The health and nutritional status may also act on fertility negatively. But their validity is contingent upon empirical investigation.

TABLE 2.5

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, by Duration of Marriage and Childhood Place of Husband: BFS, 1976

Duration of marriage and current place of residence		Childhood place of husband			
		Rural		Urban	
< 10	Rural	1.10	(1682)	1.81	(26)
	Urban	1.46	(397)	1.52	(168)
10-19	Rural	4.07	(1606)	4.23	(22)
	Urban	4.28	(355)	4.36	(137)
20 +	Rural	6.85	(1621)	6.38	(16)
	Urban	6.82	(295)	7.00	(93)
Observed mean	Rural	3.97	(4909)	3.78	(64)
	Urban	3.93	(1047)	3.78	(398)
Standardised mean	Rural	3.93		4.08	
	Urban	4.12		4.22	

TABLE 2.6

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Childhood Place of Wife and Childhood Place of Husband in Rural Bangladesh: BFS, 1976

Childhood place of husband	Childhood place of wife			
	Rural		Urban	
	A	B	A	B
Rural	3.97	3.93	4.04	4.26
Urban	3.87	3.92	3.36	5.49*

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

A = Observed mean parity
B = Duration of marriage-standardised mean parity

TABLE 2.7

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Childhood Place of Wife and Childhood Place of Husband in Urban Bangladesh: BFS, 1976

Childhood place of husband	Childhood place of wife			
	Rural		Urban	
	A	B	A	B
Rural	4.07	4.13	3.35	4.10
Urban	4.05	4.28	3.64	4.18

NOTE: A = Observed mean parity
B = Duration of marriage-standardised mean parity

Nevertheless, the overall mean parity in urban areas becomes slightly lower than that in rural areas when the differentials in age distributions are controlled. The absence of a substantial rural-urban fertility gap in Bangladesh as revealed by this analysis is supported by data available from other sources. For example, the report on the 1974 Bangladesh Retrospective Survey of Fertility and Mortality reveals that the age-standardised mean parity for urban women is 4.0 and that for rural women 4.1 (United Kingdom, 1977:114). To search for an explanation of the non-existence of a substantial rural-urban fertility differential in non-Western countries, it is pertinent to investigate how the process of urbanisation is taking place in these countries. According to a UNESCO (1958:34-35) report:

> Many cities in Asia and the Far East, in contrast with Western cities, often retain strong village characteristics or those of an agglomeration of villages. In general, they tend to be characterized by the coexistence of two distinctive areas: (i) the Western type area, and (ii) the indigenous type area consisting of an agglomeration of villages. In consequence, although a rather small elite indigenous population appears in Asian cities with the same characteristics as those possessed by urban residents in the West, the mass population of many Asian cities is resident in village agglomerations and tend to retain "folk" characteristics.

The urban localities in Bangladesh are nothing but clusters of villages full of recent migrants from the rural areas. Though no systematic study can be cited to support this contention empirically, information from the 1974 Census does not go far from this. According to this Census, of the total population enumerated in the urban area, 52.2 per cent were resident since birth, 30.2 per cent had less than ten years of residence and the remaining 17.6 per cent had ten or more years of residence (Bangladesh, 1977, Table 10, p.191). The high proportions of urban women reporting their childhood place of residence and the childhood place of residence of their husbands as the rural area also support this contention partially. Under certain assumptions, it has been estimated from the migration data of Matlab thana (a group of administrative unions) that the urban population of Bangladesh would have grown by at least 10 per cent in 1969 from rural out-migration alone (Stoeckel *et al.*, 1972). Under the circumstances, it would not be surprising if the reproductive

behaviour of the urban women does not differ markedly from that of their rural counterparts. It may take a number of generations to replace rural life style characteristics by urban values and behaviour (Goldberg, 1958-59).

2.2.2 Religion and Fertility

Religion is usually believed to be well-related with human fertility behaviour. The mechanism underlying the religious differentials is not easy to interpret, because, it is not certain that the difference in question is caused by a difference in religious orientations or in some variable associated with it. Goldscheider (1971:275) describes three hypotheses: (i) the "particularised theology" hypothesis, (ii) the "characteristics" hypothesis, and (iii) the "minority group status" hypothesis, which are most prevalent for explaining religious differentials in fertility. According to the "particularised theology" hypothesis, "... the impact of religion on fertility behavior and attitudes operates with particular church doctrine or religious ideology on birth control, contraceptive usage, and norms of family size" (Goldscheider, 1971:272). The "characteristics" hypothesis states that "..., the distinct fertility of religious subgroups merely reflects a matrix of social, demographic, and economic attributes that characterizes the religious subgroup" (Goldscheider, 1971:272). The particularised theology hypothesis places emphasis on the religious doctrines and moral codes while the characteristics hypothesis gives emphasis not on the religious group membership, but on the social, demographic, and economic characteristics that religious group membership connotes. These two hypotheses are not mutually exclusive. The "minority group status" hypothesis is used to explain religious as well as ethnic and racial differences in fertility.

Goldscheider (1971) however, casts doubt on the viability of the "particularised theology" and "characteristics" propositions. He says,

> Only when religious identification is viewed as involving subcommunities and subcultures and only when fertility is viewed as social behaviour or social process can we expect beginning solutions to the sociological understanding of the relationship between religion and fertility. (Goldscheider, 1971:298)

Chamie (1977:7), after reviewing the above three hypotheses, has proposed a new hypothesis, called the "interaction" hypothesis. According to Chamie (1977:7), ":... religious differentials in fertility are largely a function of two broad factors: (1) the doctrines and the current, local orientations of the religions involved; and (2) the socio-economic levels of the religious groups". While the other three hypotheses require cross-sectional data, the "interaction" hypothesis requires longitudinal data for empirical evaluation.

Studies conducted in Tropical Africa (Caldwell, 1968), the Middle East (Yaukey, 1961; Rizk, 1963), and the Indian sub-continent (Rele, 1963: El-Badry, 1967; Stoeckel and Choudhury, 1969) show substantial differences between Muslim and non-Muslim fertility. In his excellent review of the factors that affect Muslim fertility, Kirk (1967:150) says:

> Mohammedanism shares with other religions injunctions to marry and multiply. Children are among the richest blessings that Allah bestows - He will provide for the souls He permits to come into the world.

The marriage institutions, perception on sexuality, son preference, and subordination of women, as noted by Kirk, are among the major causes of high fertility of the Muslims. Hinduism also encourages high fertility by a number of its percepts, the approval of early universal marriage, early childbearing and the begetting of sons (Prabhu, 1958).

Unlike the teachings of the Catholic Church, Muslim doctrines do not forbid the voluntary control of births. Quoting the Mufti of Egypt, Kirk (1967:152) says, "it is permissible for either husband or wife, by mutual consent, to take any measures to prevent semen entering the uterus, in order to prevent conception". Since this statement has gone unchallenged so far, it has an important bearing upon the contraceptive practices of Muslims. Khan (1963) has translated extracts from Al-Ghazzali and Ibn Kaiyimal Jawziya, the most renowned theologians and jurists that Islam has ever produced. He noted Al-Ghazzali to declare that, "A Muslim may adopt contraceptive precautions for graceful living, to preserve his wife's beauty and vigour, or to escape numerous anxieties caused by a large family" (Khan, 1963:11). In reply to a question, His Excellency

Ayatollah Hajji Sheikh Bahaeddin (1967:1) of Iran said, "In the name of God: From the standpoint of the divine law, the utilisation of drugs or contraceptive devices, especially if it is temporary, to control human fertility does not seem illegal if this practice does not lead to damage the female's fecundity and make her barren". The Muslims of Bangladesh, as in other countries, are not aware of these principles of Islam. They still believe with other religions fatalistic themes which prevent them from rationally thinking about the voluntary control of births.

The differences between average fertility of Muslim and non-Muslim women in Bangladesh as obtained from the BFS data are negligibly small (Table 2.8). Except the age group 10-19 in the rural area, the mean parity of Muslim women is higher than that of non-Muslim women in all age groups in both the rural and urban areas of Bangladesh. This makes Muslim fertility to be slightly higher than non-Muslim fertility when standardised for age. The standardised mean parity is 4.0 for Muslim and 3.8 for non-Muslim women in the rural area. In the urban area, the standardised parity is 3.9 for Muslim and 3.6 for non-Muslim women. The same pattern of relationship between religion and fertility is observed in both the rural and urban areas when the differential effect of duration of marriage is controlled (Table 2.9). It is important to note that the differentials obtained by standardising either age or duration of marriage are very small.

It is sometimes argued that religion is not a significant factor and that it operates on fertility through education and income. This is examined here by comparing the mean parity of Muslim and non-Muslim women at different levels of education of wife and at different levels of economic status. In both cases the duration of marriage is controlled. It is evident that at primary level of education, Muslim fertility tends to be slightly higher than non-Muslim fertility in the rural area and that at the level of no education, there is no difference between Muslim and non-Muslim fertility in both the rural and urban areas (Table 2.10). It is also evident that poor Muslim women have slightly higher fertility than poor non-Muslim women in both the rural and urban areas, whereas there is no difference in fertility of Muslim and non-Muslim women who are rich (Table 2.11).

TABLE 2.8

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Current Age and Religion: BFS, 1976

Current age and place of residence		Religion			
		Non-Muslim		Muslim	
10-19	Rural	0.73	(159)	0.61	(911)
	Urban	0.69	(29)	0.79	(238)
20-29	Rural	2.92	(324)	3.18	(1568)
	Urban	2.71	(87)	2.95	(535)
30-39	Rural	5.65	(196)	6.14	(946)
	Urban	5.48	(63)	5.93	(291)
40-49	Rural	6.64	(179)	7.01	(739)
	Urban	6.38	(47)	6.83	(199)
Observed mean	Rural	3.91	(858)	3.97	(4164)
	Urban	3.99	(226)	3.84	(1263)
Standardised mean	Rural	3.75		4.01	
	Urban	3.58		3.88	

TABLE 2.9

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Religion: BFS, 1976

Duration of marriage and place of residence		Religion			
		Non-Muslim		Muslim	
< 10	Rural	1.22	(289)	1.09	(1445)
	Urban	1.46	(80)	1.47	(507)
10-19	Rural	3.78	(281)	4.13	(1358)
	Urban	4.31	(80)	4.31	(425)
20 +	Rural	6.74	(288)	6.86	(1361)
	Urban	6.65	(66)	6.87	(331)
Observed mean	Rural	3.91	(858)	3.97	(4164)
	Urban	3.99	(226)	3.84	(1263)
Standardised mean	Rural	3.84		3.95	
	Urban	4.07		4.15	

TABLE 2.10

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Religion and Education of Wife, Standardising for Duration of Marriage: BFS, 1976

	Non-Muslim		Muslim	
Education of wife	Rural	Urban	Rural	Urban
Uneducated	3.85	3.99	3.94	4.12
Primary	3.83	4.47	4.00	4.37
Secondary or more	4.15*	3.87*	3.68	3.93

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

TABLE 2.11

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Religion and Economic Status, Standardising for Duration of Marriage: BFS, 1976

	Non-Muslim		Muslim	
Economic status	Rural	Urban	Rural	Urban
Poor	3.72	3.71	3.92	4.01
Rich	4.10	4.36	4.04	4.31

Obaidullah (1966) showed that Muslim fertility was about 26 per cent higher than Hindu fertility in rural areas of Bangladesh during the period 1961-62. The difference as he observed in urban areas was, however, negligibly small. The Bangladesh Retrospective

Survey of Fertility and Mortality also reports that Muslims have higher fertility (about 0.4 of a child) than Hindus in the country as a whole (United Kingdom, 1977:110). Badrud Duza's (1967) findings do not show a positive correlation between fertility and the percentage of Muslims in Pakistan. He argues that wide social changes that have occurred to the population of Pakistan from 1947 to 1961 might have altered the previous base of differential fertility by religion.

Chaudhury (1971), by using the 1961 Census data of East Pakistan and taking the child-woman (ever married) ratio as an index of fertility, casts doubt on the suggestion of Badrud Duza. According to Chaudhury (1971), Muslims have higher fertility than Caste and Schedule Caste Hindus possibly for the following reasons: (1) higher proportion of women enjoying lengthy conjugal life; (2) higher infant mortality; (3) unfavourable attitudes toward family planning; (4)less ritual abstinence.

The BFS data show that 59.9 per cent of the Muslim women and 64.6 per cent of the non-Muslim women in the urban area have experienced ten or more years of duration of marriage. The percentages of Muslim and non-Muslim women having ten or more years of conjugal life in the rural area are 65.3 and 66.3 respectively. This differential distribution of duration of marriage has been controlled here. Thus it cannot be said that the higher fertility of Muslim women as evident from the BFS data is due to the higher proportion of them in the lengthy marital life. No estimates of infant and child mortality by religion have been produced here from the BFS data. The Bangladesh Retrospective Survey of Fertility and Mortality, being conducted only two years before the BFS reports that Muslims had lower infant and child mortality than the Hindus (United Kingdom, 1977:109). If this happens to be so from the BFS data, then it cannot be argued that higher infant mortality of Muslims makes Muslim fertility higher. As regards the pattern of contraceptive usage, the proportion of Muslim (currently married, fecund) women who have ever used a contraceptive method is considerably lower than the proportion of non-Muslim (currently married, fecund) women who have ever used a contraceptive method (Bangladesh, n.d.). This factor along with others, such as less ritual and short postpartum abstinence observed by Muslims, and their comparatively low age at marriage may account for their higher fertility. The validity of this speculation is contingent upon empirical verification.

2.2.3 Education and Fertility

There is a general hypothesis that fertility decreases with increasing levels of education. This hypothesis has been tested empirically across a wide range of societies to yield a consistent pattern. Mason *et al.* (1971:48-52), for example, uncovered a consistent and in most cases a strong inverse relationship between education and fertility in 24 of the 32 empirical studies they reviewed. Kasarda (1971) investigated into the empirical relationship between each of the three exogenous variables, urbanisation, industrialisation, and education, and the fertility measures, using data from forty nine nations. His findings suggest that each of the variables bears a strong inverse relationship to fertility. From a sample survey of households in the city of Lucknow in India, Husain (1970) found a strong negative relationship between general fertility rate and educational status of the households. Driver (1963) noted from his study in the Nagpur district of India that after controlling for age women with primary education formed the highest parity group, while those with more than primary education remained as the lowest parity group. Hull and Hull (1977) showed from Indonesian data that women with no education and secondary education had lower mean births than those with primary education. They contend that the fertility differentials exhibited by level of schooling of ever married women are at least partially real and not merely the result of recall lapse of uneducated women. Pullum (1975:168) using data of the 1968 National Demographic Survey in the Philippines, concludes that "better-educated women tend to have higher fertility than less-educated women, controlling for marital exposure, up to about age 35". While these conclusions act against the general hypothesis, some studies suggest that some threshold level of educational attainment may be necessary for education to have a profound impact on fertility. Such indications of a threshold level have been found in empirical studies in the United States (Freedman *et al.* 1959) as well as Puerto Rico (Jaffe, 1959; Stycos, 1968; Bouvier and Macisco, 1968).

Holsinger and Kasarda (1976:156-169) advocate that education influences fertility in three fundamental ways: (i) by exerting a direct influence on fertility; (ii) by affecting other variables that have a direct influence on fertility; and (iii) by an interaction effect of education and other independent variables. The host of

factors as enumerated and summarised by Holsinger and Kasarda are given below to help understand the causal mechanisms through which education operates on fertility.

(i) Direct effects of education

Education affects fertility directly by changing individuals' attitudes, values, and beliefs towards small family size. It affects a broad spectrum of psychological attributes, including freedom from tradition, heightened aspirations, views concerning ideal family size, contraception and other modern values which are germane to the motivation for limiting family size.

(ii) Indirect effects of education

(1) "Formal schooling delays age at marriage and thereby reduces the total possible number of childbearing years of the wife."

(2) "Education provides directly or facilitates the acquisition of information on modern contraceptive devices and use."

(3) "Education increases exposure to mass media and printed materials concerning family planning."

(4) "Education increases aspirations for upward mobility and the accumulation of wealth, which reduce the desirability of large families."

(5) "Schooling enhances a girl's prospects for obtaining employment outside the home that competes with bearing and rearing children as a career."

(6) "Education reduces the perceived economic utility of children, thus lowering the demand of parents for them."

(7) "Schooling affects communication between husbands and wives in ways that are conducive to lower fertility."

(8) "Schooling affects fertility by reducing infant and child mortality."

(9) "Schooling imparts a sense of self-efficacy, control over one's own fate, trust in science and technology, all of which promote the use of contraception as a rational means of controlling one's life and destiny."

(iii) Joint effects of education

In addition to its direct and indirect effects, education

affects fertility jointly with other exogenous variables, such as urbanisation and industrialisation.

The impact of education on fertility of the ever married women cannot be ruled out in Bangladesh. Although a consistent pattern of a direct relationship between education and fertility is revealed by the BFS data, the differentials become negligible when duration of marriage is controlled (Table 2.12). After standardising by duration of marriage, women with primary education become the highest mean parity group, while women with secondary or more education still remain as the lowest mean parity group. This pattern is in force in both the rural and urban areas of Bangladesh.

TABLE 2.12

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Education of Wife: BFS, 1976

Duration of marriage and current place of residence		Education of Wife		
		Uneducated	Primary	Secondary or more
< 10	Rural	1.11	1.15	0.94
	Urban	1.48	1.57	1.35
10-19	Rural	4.05	4.15	3.92
	Urban	4.32	4.50	3.88
20 +	Rural	6.84	6.81	6.83
	Urban	6.71	7.33	6.66
Observed Mean	Rural	4.16	3.35	2.13
	Urban	4.15	4.00	2.65
Standardised Mean	Rural	3.93	3.96	3.82
	Urban	4.10	4.39	3.89

Inspection of the mean parity by duration of marriage reveals that in the urban area, women with primary education have the highest parity at all groups of duration of marriage. They also have the highest parity in the rural area except the highest duration of marriage.

The education of husbands as borne out by the BFS data is not as significant as that of wives in depressing their average fertility. Although the differences in mean parities are very small, there is a weak decreasing trend in fertility of women with increasing educational levels of husbands (Table 2.13). This trend vanishes in the rural area and gets reversed in the urban area when duration of marriage is controlled. Again the differences are negligible. Thus it cannot be said that in Bangladesh, education of husbands can make any significant differences in the average fertility of their wives. However, unlike the education of wife, the education of husband tends to show a positive relationship with fertility when compared by taking different groups of duration of marriage in the urban area.

TABLE 2.13

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Education of Husband: BFS, 1976

Duration of marriage and current place of residence		Education of Husband		
		Uneducated	Primary	Secondary or more
< 10	Rural	1.07	1.19	1.14
	Urban	1.44	1.45	1.49
10-19	Rural	4.02	4.06	4.21
	Urban	4.17	4.22	4.50
20 +	Rural	6.76	7.00	6.94
	Urban	6.49	6.93	7.31
Observed Mean	Rural	4.04	4.00	3.61
	Urban	4.01	3.76	3.74
Standardised Mean	Rural	3.88	4.01	4.02
	Urban	3.97	4.13	4.36

It would be interesting to examine how the education of wife and that of husband affect fertility jointly. With this end in

view, efforts should be made to control duration of marriage, because, it has been seen that after controlling for the duration of marriage, the pattern of relationship between education and fertility either changes or the differences in fertility become very small even if the set pattern persists. There are significant differentials in observed mean parities of the groups: (i) uneducated women with uneducated husbands; (ii) women with primary education and having husbands with primary education; and (iii) women with secondary or more education and having husbands with secondary or more education (Tables 2.14 and 2.15).

However, after the standardisation, the differences in mean parties of the above three groups diminish completely in both the rural and urban areas. The highest parity group in both the rural and urban areas is the women with primary education and having husbands with secondary or more education. The lowest parity group in the rural area is the women with primary education and having husbands with no education and that in the urban area is the women with secondary or more education and having husbands with secondary or more education.

How the education of the ever married women is associated with their average fertility is also evident from data available from other sources in Bangladesh. For example, the 1974 Census of Bangladesh (Bangladesh, 1977) reports that women with no schooling had borne on an average 3.9 live births, women with primary education, 3.4 live births, and women with secondary or more education, 2.6 live births. These figures are, however, not standardised for either age or duration of marriage. Much confidence cannot be vested in these findings for the purpose of comparisons.

Chaudhury (1978) reports that the mean number of children ever born decreases consistently as the educational level of currently married, fecund women increases. This holds true even after adjusting for the effects of duration of marriage, and age at marriage. His study area was, however, limited to Dacca, the capital of Bangladesh. The report on the 1974 Bangladesh Retrospective Survey of Fertility and Mortality, on the other hand, reveals that women who have primary education tend to bear more children than do women who have no education. The report also reveals that the education of husbands tends to be positively associated with the average fertility of their wives.

TABLE 2.14

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Education of Wife and Education of Husband in Rural Bangladesh: BFS, 1976

	Education of Wife					
	Uneducated		Primary		Secondary or more	
Education of husband	A	B	A	B	A	B
Uneducated	4.13	3.89	2.87	3.63	1.20*	1.33*
Primary	4.23	4.02	3.31	3.90	2.67	4.36*
Secondary or more	4.23	4.00	3.57	4.13	2.13	3.79

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

A = Observed mean parity
B = Duration of marriage-standardised mean parity

TABLE 2.15

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Education of Wife and Education of Husband in Urban Bangladesh: BFS, 1976

	Education of Wife					
	Uneducated		Primary		Secondary or more	
Education of husband	A	B	A	B	A	B
Uneducated	4.13	3.97	2.86	3.68*	2.75*	3.60*
Primary	3.98	4.13	3.41	4.01	2.20*	2.65*
Secondary or more	4.44	4.53	4.61	4.62	2.65	3.89

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

A = Observed mean parity
B = Duration of marriage-standardised mean parity

The data obtained from the BFS are in line with other sources that the education of wife after primary school has a slight tendency to depress fertility. The education of husband, on the other hand, has a positive but insignificant relation or no relation at all with fertility.

What factors can be held responsible for the differentials in fertility by the education of wife? More in-depth analysis is required to answer this question. However, it may not be exaggerated in saying that a highly education woman is more likely to marry at later ages, she will be less confined physically and psychologically within her husband's family, she will be more eager to provide medical care for her children, and she will be better able to save some resources so that she does not have to depend on her children in her old age. Moreover, she will be more likely to feel free in discussing about the regulation of sex with her husband. These characteristics of a highly educated woman are likely to induce her to limit her fertility through contraceptive usage. That the education of wife is positively associated with the use of contraceptive method is established by the BFS data elsewhere (Bangladesh, n.d.) and by other sources of data (Chaudhury, 1978).

2.2.4 Working Status of Respondents and Fertility

There has been a considerable interest in finding the relationship between female labour force participation and fertility. Although the relationship is most often negative in the industrialised countries (Blake, 1965; Ridley, 1968; Weller, 1968), it is less clear in most developing countries (Gendell *et al.*, 1970; Heer and Turner, 1965; Miro and Rath, 1965). The problem with which the researchers are entangled is that it is difficult to understand whether women have fewer children because they work or work because they have fewer children. Ridley (1959) concludes from her analysis of the data obtained from the Growth of American Families study, that long work experience is associated with low fertility even after allowance is made for fecundity impairment. Whelpton *et al.*, (1966), on the other hand, finds from the second Growth of American Families study, that subfecund women tend to seek employment. No generalisation can be made as to the female-employment-fertility relationship on the basis of these studies, because it varies from one type of society to another and from one sector of society to another.

Nevertheless, attention has been drawn to the concept of role incompatibility in attempting to explain variations in the strength of the association between female employment and fertility (Stycos and Weller, 1967). The more mutually exclusive are the roles of mother and worker, the more likely it is that gainfully employed women will tend to have smaller families than nonemployed women. The degree of incompatibility between the two roles again varies with variations in the socio-economic status of women and the type of occupations in which they are engaged. In traditional rural economy of the developing countries, children are viewed as a potential source of cheap labour, social prestige, old age security, psychological benefit, and economic help to parents in distress. Here within the extended family structure, women find no conflict between the roles of worker and mother. Moreover, the family farms and the cottage industries are the only sources of employment where a woman may keep her younger children with her while she works. The role of incompatibility theory is not, therefore, strongly operative here. Even in traditional rural sector of a more developed country like Japan, fertility was observed to be the highest among married women who were engaged in agricultural work (Jaffe and Azumi, 1960).

In the urban areas, on the other hand, the theory of role incompatibility can possibly play a part in reducing fertility of women who are employed outside the home in some modern sector of the economy. Piepmeier and Adkins (1973:511) say, "The conditions of the working women in urban areas in developing countries differ from those in rural areas in three main ways: (i) job opportunities become slightly extended to include domestic and factory work; (ii) employment shifts from the category of unpaid to paid worker; (iii) the home is no longer the centre of economic activity". They postulate that of these three, the last is perhaps the most significant factor that can reduce fertility by increasing the conflict between the roles of mother and worker. They, however, conclude that employment as an independent variable is not significant and that it becomes significant when coupled with related variables such as education and socio-economic status. In San Juan, Puerto Rico, a high score on the index of incompatibility was found to be associated with high education and high income by Weller (1968). But he did not intend to generalise it because of the complex relationship between socio-economic status and role incompatibility.

In rural Bangladesh, working women show lower mean births than non-working women in all age groups except the group 20-29, the highest difference being about 1.8 in the age group 40-49 (Table 2.16). To explain this variation in completed parity between the working and non-working women aged 40-49, control should be made for their age at marriage and duration of marriage and investigation should be carried out on their detailed work history by education, income, and contraceptive practice. After standardising for age, the mean parity of non-working women becomes 4.0, while for working women it is 3.7. This is in line with the general hypothesis that working women would have less fertility than non-working women if the concept of role incompatibility holds true.

In the urban area, the mean parity of working women is consistently lower than that of non-working women in all age groups except the group 10-19. The relatively small sample size of working women at the age group 10-19 in the urban area may account for the higher mean parity of this group than non-working women. After age 19, the difference between the mean parity of non-working and working women becomes wider and wider. The difference between the age-standardised mean parity of non-working and working women also becomes considerably higher.

TABLE 2.16

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Current Age and Working Status: BFS, 1976

Current age and place of residence		Working Status			
		Non-working		Working	
10-19	Rural	0.63	(994)	0.48	(77)
	Urban	0.75	(247)	1.10	(20)
20-29	Rural	3.11	(1667)	3.33	(224)
	Urban	2.98	(521)	2.56	(100)
30-39	Rural	6.09	(942)	5.88	(200)
	Urban	6.07	(289)	4.88	(64)
40-49	Rural	7.25	(754)	5.49	(164)
	Urban	7.04	(188)	5.65	(57)
Observed Mean	Rural	3.91	(4357)	4.30	(665)
	Urban	3.87	(1245)	3.78	(241)
Standardised Mean	Rural	4.02		3.70	
	Urban	3.95		3.34	

NOTE: "Working" women include those who were currently working and those who had worked some time after marriage.

That the working status of wife is inversely related to fertility is also evident from the BFS data when duration of marriage is controlled. In the rural area, the standardised mean parity is 4.0 for non-working women, 3.8 for working women, whereas in the urban area the standardised mean parity is 4.2 for non-working and 3.8 for working women (Table 2.17). The pattern of fertility by duration of marriage shows that working women tend to average lower mean parity than non-working women from twenty years of duration of marriage in the rural area, and from ten years of duration of marriage in the urban area.

TABLE 2.17

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Working Status: BFS, 1976

Duration of marriage and current age		Working Status			
		Non-working		Working	
< 10	Rural	1.10	(1580)	1.24	(155)
	Urban	1.42	(512)	1.74	(74)
10-19	Rural	4.05	(1405)	4.21	(233)
	Urban	4.41	(407)	3.88	(98)
20 +	Rural	6.99	(1372)	6.09	(277)
	Urban	7.03	(326)	5.84	(69)
Observed Mean	Rural	3.91	(4357)	4.30	(665)
	Urban	3.87	(1245)	3.78	(241)
Standardised Mean	Rural	3.97		3.78	
	Urban	4.21		3.77	

Using the 1961 Census data and taking the child-woman ratio as an index of fertility, Chaudhury (1974) finds for Bangladesh as a whole: (i) a negative and statistically significant relationship between female labour force participation and fertility; and (ii) a positive and statistically significant relationship between female engaged in domestic work and fertility. He, however, finds two conflicting relationships between female labour force participation and fertility when he divides females in labour force into two groups: (i)non-agricultural; and (ii) agricultural. The former group shows a positive but insignificant while the latter group shows a negative

and significant relation with fertility. Although these findings are rather surprising, Chaudhury (1974) contends that if women are provided with alternative roles to play other than those related to household work, then their fertility will go down even in the traditional sector of the economy. This contention of Chaudhury does support the findings of the present analysis when mean numbers of children ever born to working and non-working ever married women are compared in the rural and urban areas of Bangladesh by controlling either age or duration of marriage.

In another study of Chaudhury (1978) it is noted that work experience has very little or no effect on fertility of currently married, fecund women living with their husbands in Dacca, the capital of Bangladesh. This study reveals another striking point in that fertility varies with work status at the lower levels of education, but there is little or no variation in fertility by work status at the higher levels of education.

The present analysis reveals that fertility varies with work status at all levels of education, but not in the same direction (Table 2.18). In both the rural and urban areas, a working woman who is uneducated or who has secondary or more education has borne fewer children than her counterpart who is not working. But at primary level of education, working women have more children than non-working women irrespective of place of residence. Work experience is also found to have a negative effect on fertility at both the levels (poor and rich) of economic status (Table 2.19). The highest difference in fertility (0.6 of a child) is observed between the rich non-working and rich working women in the urban area.

From the above findings of this analysis it may be concluded that working women, whether in rural or urban areas, whether uneducated or highly educated, whether rich or poor, have lower fertility than their counterparts who are non-working, provided that duration of marriage is controlled.

TABLE 2.18

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Working Status and Education of Wife, Standardising for Duration of Marriage: BFS, 1976

Education of Wife	Non-working		Working	
	Rural	Urban	Rural	Urban
Uneducated	3.97	4.20	3.76	3.73
Primary	3.96	4.37	4.13	4.58*
Secondary or more	3.87	4.04	3.37*	3.25*

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

TABLE 2.19

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Working Status and Economic Status, Standardising for Duration of Marriage: BFS, 1976

Economic status	Non-working		Working	
	Rural	Urban	Rural	Urban
Poor	3.93	4.04	3.77	3.76
Rich	4.06	4.37	3.88	3.81

2.2.5 Occupation of Husband and Fertility

The occupation of husband is probably one of the most widely utilised indices of socio-economic status in the study of fertility differentials. In Bangladesh, women rarely go outside the home for paid employment. The roles of housewives and mothers as sanctioned by the society and the dominance of husbands over the wives in decision-making prevent them from doing outside work. Moreover, the competition for gainful employment is very keen under the conditions of unemployment, underemployment, and low wages, and women find it very difficult to exercise their right to equal work and equal pay. They are destined to stay at home and abide by the prescribed rules of the family and the society. One can therefore hypothesise that the fertility of wives would be influenced by the occupational status of the husbands. In the developed countries, during the period of fertility decline, lower fertility was found to be associated with the professional classes, white-collar workers and urban industrial workers, while relatively high fertility was observed to be associated with the primary industries, particularly agriculture and mining (United Nations, 1973). This pattern of relationship is not maintained all the time in all countries and in some countries it is rather inverse. Yaukey (1961) found no significant differences between the fertility levels of Muslim farmers and non-farmers of the villages and towns in Lebanon. In Karachi, it was noted by Hashmi (1965) that farmers, fishermen, and related workers had the lowest fertility rates, while the members of the armed forces and professional, technical and related workers had the highest fertility. In India, on the other hand, the highest fertility was observed among the agricultural group and the lowest fertility among the clerical group (Driver, 1963:92). The difference, however, narrowed down when the differences in age were controlled. Similarly in Singapore, fertility was observed to be lower among the white-collar workers than among blue-collar workers (Chang, 1974).

In the rural areas of Bangladesh, after standardising for age, the agricultural (own land) workers appear as the most fertile group, while the unclassified workers, the production and related workers, and the white-collar workers become the least fertile group (Table 2.20). The difference between the age-standardised mean parity of these two extreme groups, however, does not exceed 0.4. In

the urban area, the landless agricultural workers show the least fertility, while the white-collar workers and the unclassified labourers show the highest fertility when age is controlled. The difference between the age-standardised mean parity of these two groups is not more than 0.6.

TABLE 2.20

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Current Age and Occupation of Husband: BFS, 1976

Current age and place of residence of wife		Occupation of husband				
		Unclassified	Landless Agricultural	Production & related	Agricultural (own land)	White-collar
10-19	Rural	0.50	0.60	0.65	0.63	0.72
	Urban	0.92	0.91	0.81	0.57	0.75
20-29	Rural	3.09	3.09	2.95	3.29	2.97
	Urban	3.03	2.35	2.86	2.94	2.93
30-39	Rural	5.80	5.99	5.78	6.27	5.84
	Urban	5.94	4.79	5.59	5.75	6.12
40-49	Rural	6.36	7.26	6.87	7.10	6.54
	Urban	6.45	6.30	6.43	6.97	6.95
Observed Mean	Rural	3.61	3.65	3.54	4.32	3.74
	Urban	3.66	3.46	3.53	4.33	4.04
Standardised Mean	Rural	3.75	3.98	3.82	4.10	3.80
	Urban	3.87	3.32	3.70	3.81	3.92

The standardisation by duration of marriage reinforces the fact that in the urban area, the landless agricultural workers are the least fertile group and the white-collar workers, the most fertile, and that in the rural area, the unclassified labourers are the least fertile and the agricultural (own land) workers are the most fertile groups (Table 2.21).

TABLE 2.21

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Occupation of Husband: BFS, 1976

Duration of marriage and current place of residence of wife		Occupation of husband				
		Un-classified	Landless Agri-cultural	Production & related	Agri-cultural (own land)	White-collar
< 10	Rural	0.93	1.07	1.06	1.16	1.22
	Urban	1.31	1.62	1.36	1.46	1.54
10-19	Rural	4.13	4.00	3.86	4.18	3.93
	Urban	4.22	4.06	4.17	4.35	4.45
20 +	Rural	6.28	6.90	6.52	7.02	6.77
	Urban	6.64	6.00	6.32	7.20	7.11
Observed Mean	Rural	3.61	3.65	3.54	4.32	3.74
	Urban	3.66	3.46	3.53	4.33	4.04
Standardised Mean	Rural	3.71	3.91	3.74	4.04	3.90
	Urban	3.99	3.84	3.88	4.26	4.29

It appears from the above findings that the association of occupation and the average level of fertility in Bangladesh does not conform to a pattern of class position. Also no systematic pattern of relationship can be deduced between occupation and mean parity when studied by age and duration of marriage in both the rural and urban areas of Bangladesh.

Why the fertility of unclassified labourers is less than that of agricultural (own land) workers in the rural area? Presumably, both types of workers will place high value on having a large number of children, marry at a low but almost same age, and practise no voluntary birth control, it can be hypothesised that the former will have lower fertility than the latter due to: (1) higher proportion of wives working outside home; (2) worse health status; and (3) less coital frequency caused by seasonal labour migration and disintegration of stable family life.

A comparison between the working and non-working women by the occupation of husband shows that, in the rural area, 25 per cent of working women have husbands who are unclassified labourers while the percentage of working women whose husbands are agricultural (own land) workers is only 7.6. Since the working status of the wife is negatively associated with fertility (see section 2.2.4), a higher proportion of working wives of the unclassified labourers will obviously lead to a lower average fertility. No data pertaining to the second and third factors are available in this analysis. However, it would not be overemphasised in predicting that agricultural workers who have their own land to cultivate are less likely to move out and that the unclassified labourers who are at the bottom of the society are more likely to move out in search of occupational opportunities. It has been estimated from a study that occupational absences of the husbands could account for a 10 per cent decrease in the birth rate that would be recorded if the husband remained at home (Chen *et al.*, 1974). The differential in fertility by the presence or absence of the husband should again be restricted to currently married women, because only the currently married women in Bangladesh are exposed to intercourse.

In the urban area the white-collar workers have higher fertility than the landless agricultural workers possibly for the following reasons: (1) low proportion of wives working outside; and

(2) better economic status. The percentage of the working wives of the white-collar group (about 12.7 per cent) in the urban area is much lower than the corresponding percentage (about 33.3 per cent) of the landless agricultural group. But the percentage of the rich, white-collar workers (about 70 per cent) is much higher than the percentage of the rich, landless agricultural workers (about 14.3 per cent). As it can be seen from the following section that the rich tend to have higher fertility than the poor in both the rural and urban areas, the postulated factors partly or wholly account for the observed differentials in fertility.

2.2.6 Economic Status and Fertility

The relationship between a family's economic position and the number of children achieved and/or planned is a complex one. Historically, there has been an inverse rather than a positive relationship between economic status and fertility in the West during the period of urbanisation and industrialisation (United Nations, 1953). Recent works on the development of the economic theory of fertility reveal that economic status has been associated with both negative and positive effects on fertility in both the developing and the developed countries. In most of these studies, income rather than wealth is used as an index of economic status, because data on wealth are very sparse and because the distribution of income is often easier to manipulate than is the distribution of wealth. Becker (1960:217) suggests that "... a rise in income would increase both the quality and quantity of children desired ...". His model is based on the conventional economic theory of consumer behaviour by treating children as a consumption good analogous to cars, houses and refrigerators. It is conceptually reasonable that if children provide utility, a rise in income, lessening the constraint on consumption, should increase the consumption of all kinds of goods, including having more children. Serious objection was raised, however, by Blake (1968) to Becker's thesis in that children cannot be considered as consumer goods, because they certainly have some properties which set them apart from most consumer durables. Several other economists have put forward economic theories of fertility determination. But most of these theories are based primarily on

Western, urbanised, industrialised societies, and care should be taken while applying these theories to the peasant life in developing countries.

Freedman (1975) investigated the inter-relation between modern consumption patterns and fertility behaviour in Taiwan. She observed that consumption of modern durables were negatively related to number of living children even after adjusting for income and education. Similarly in Singapore, as noted by Chang (1974), a negative relationship was observed between standard of living (measured by the ownership of modern consumer durables) and fertility (measured by the average number of children under five years of age of household heads).

Very little is known about the relationship between consumption of modern durables and fertility in Bangladesh. The BFS is probably the first of its kind to collect data on possession of household assets, including the modern durables. An index of economic status, as described earlier, is made on the basis of the holdings of these items to examine its relation to fertility.

A comparison between fertility of two different economic groups, poor and rich, by age, by duration of marriage, and by education of wife is attempted here for the rural and urban areas of Bangladesh. It is evident that there is little or no difference in mean parity by economic status in all age groups except the group 40-49 in the rural area and the groups 30-39, and 40-49 in the urban area (Table 2.22). At the age group 40-49 a rich woman tends to have 0.5 more children in the rural area and 0.7 more children in the urban area than a poor woman. At the age group 30-39 in the urban area, a rich woman tends to have borne 0.6 more children than a poor woman. Controlling for age, poor women tend to have borne fewer children than rich women, though the difference is negligible.

The same pattern of relationship between economic status and fertility is observed when duration of marriage is controlled (Table 2.23). The duration-specific mean parity of rich women is either equal to or slightly greater than that of poor women in both the rural and urban areas. The highest difference is however, 0.9 of a child in the urban area at the highest duration of marriage. A further analysis has to be pursued to explain this differential. However, it can be postulated at this stage that poor women having twenty or more years of duration of marriage probably spent a long

period working outside the home for mere survival. While working they might have found childbearing an obstacle to continuing their work. But because they had to work for the mere survival, they were compelled to limit their fertility.

TABLE 2.22

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Current Age and Economic Status: BFS, 1976

Current age and place of residence of wife		Economic status			
		Poor		Rich	
10-19	Rural	0.62	(732)	0.63	(339)
	Urban	0.82	(125)	0.75	(142)
20-29	Rural	3.15	(1341)	3.10	(552)
	Urban	2.92	(303)	2.91	(319)
30-39	Rural	6.01	(863)	6.19	(279)
	Urban	5.61	(195)	6.16	(159)
40-49	Rural	6.80	(652)	7.29	(266)
	Urban	6.41	(128)	7.10	(118)
Observed Mean	Rural	3.98	(3588)	3.89	(1436)
	Urban	3.86	(751)	3.86	(738)
Standardised Mean	Rural	3.93		4.04	
	Urban	3.72		3.95	

The differentials in fertility by economic status are also found to persist at different levels of education of wife. The uneducated rich women have slightly higher fertility than the uneducated poor women in the rural area, but considerably higher fertility (0.6 of a child) in the urban area (Table 2.24). Although

there is no difference between fertility of rich and poor women with primary education in the rural area, the difference is 0.3 of a child in the urban area. No reliable and consistent pattern is indicative at the secondary level because of small sample size. Nevertheless, the above findings do suggest that fertility varies positively with economic status though the difference is very small.

TABLE 2.23

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Duration of Marriage and Economic Status: BFS, 1976

Duration of marriage and current place of residence		Economic Status			
		Poor		Rich	
< 10	Rural	1.09	(1187)	1.16	(548)
	Urban	1.42	(266)	1.50	(321)
10-19	Rural	4.05	(1188)	4.12	(452)
	Urban	4.25	(273)	4.38	(232)
20 +	Rural	6.75	(1213)	7.09	(436)
	Urban	6.42	(212)	7.31	(185)
Observed Mean	Rural	3.98	(3588)	3.89	(1436)
	Urban	3.86	(751)	3.86	(738)
Standardised Mean	Rural	3.89		4.05	
	Urban	3.96		4.32	

TABLE 2.24

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Economic Status and Education of Wife, Standardising for Duration of Marriage: BFS, 1976

Education of Wife	Poor		Rich	
	Rural	Urban	Rural	Urban
Uneducated	3.87	3.93	4.11	4.47
Primary	4.01	4.19	3.93	4.46
Secondary or more	4.22*	3.24*	3.79	3.92

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage

The absence of a substantial difference in fertility by economic status may have resulted from a wide range of underlying factors. Poor women, on the one hand, place a high value on the large number of children. They think that the more children, especially male ones they will have, the more likely it is that their economic condition will improve because of children's involvement in the work force. From a study conducted in a typical village of Bangladesh, Cain (1977:224) concludes, "Children of both sexes begin to work and put in relatively long hours of work at young ages. Male children appear to become net producers at least by age 12, compensate for their cumulative consumption by age 15, and compensate for their own and one sister's cumulative consumption by age 22". Though this conclusion may not reflect the work of all children in the country and it may vary by economic status, it would remain unequivocal that poor women perceive their children as economic assets. This does not necessarily mean that parents perform any conscious calculations on fertility, but an awareness of the fact that children are economically advantageous to them. Moreover, women of lower and poorer groups may tend to bear more children, partly because they have shorter lactation and anovulatory periods due to the death of children in their infancy and partly because they want to replace those they lose (Potter *et al.*, 1965).

Rich women, on the other hand, may not find a large number of children as a financial burden. Consumption of modern durables or household assets may not be achieved at the expense of limiting children. In case these compete, it is more likely that they will go for children and forego consumption durables. Like poor women, they also think that the more children they will have, the more prosperous and better-off they will be in course of time. Children help their parents by strengthening their local power, working in the family farm or enterprise, ensuring the control over family property if the father dies or becomes incapacitated, and by augmenting family holdings through marriage and purchase or foreclosure of mortgages (Arthur and McNicoll, 1978). In addition, they can increase the social prestige of their parents if they are sent to school, employed in white-collar occupations, and married to brides/grooms of a family of higher status. Because of all these factors and because of

improved nutrition which influences both fecundity and early marriage, rich women too have large families. From an econometric investigation by Sirageldin *et al.* (1976), it was suggested that an improvement in economic well-being would probably have a positive impact on fertility in Bangladesh. This conclusion was based on data obtained from the National Impact Survey conducted in Bangladesh in 1968-69.

CHAPTER 3

MARITAL STATUS, AGE AT MARRIAGE AND FERTILITY

3.1 Marital Status and Fertility

Of the ever-married women, proportions currently married, widowed, divorced and separated, childless and the number of marriages play an important role in differential fertility. The amount of the reproductive period spent after or between unions, either as a result of divorce, separation or desertion, or as a result of the husband's death is one of the "intermediate variables" of Davis and Blake (1956). It has a negative effect on marital fertility. Davis (1946) estimated that the ban on widow remarriage in India curtailed the Hindu birth rate by an average of 16.4 per cent in the period 1901-1941. Nag (1962) found evidence of a negative effect of the high proportion of widows on marital fertility in some Asian societies. Driver (1963), on the other hand, found in India that even when age is controlled, the fertility of widows exceeded that of remarried women. He found that the very fertile women had almost no chance of remarriage, whereas infertile women had a very high probability of being remarried.

Palmore and Marzuki (1969) used the technique of Multiple Classification Analysis (MCA) to investigate the differentials in fertility by age at first marriage and being married more than once for a sample of West Malaysian currently married women aged 15-44 years. After controlling for the effects of age at marriage and the other variables: present age by single years, race, residential stratum, and education, they found that multiple marriages lead to lower cumulative fertility. From a hypothetical calculation of the effect of being married more than once on cumulative fertility, they concluded that "..., decreases in rates of divorce or widowhood would lead to some increase in the fertility of women who might otherwise be divorced or widowed", in West Malaysia (Palmore and Marzuki, 1969: 399-400).

From the BFS data it is evident that of the 5024 ever married women aged 10-49 in the rural area, 89.0 per cent are

currently married, 8.0 per cent widowed, and the remaining 3.0 per cent divorced and separated (Table 3.1). Of the 1489 ever married women aged 10-49 in the urban area, the corresponding percentages of currently married, widowed, and divorced and separated women are 87.5, 8.8 and 3.7. The percentage of divorce and separation as revealed by the BFS data is fairly low. Although divorce is considered to be easy, it is restrained by the fact that the husband must return the dowry to the wife or otherwise pay a substantial penalty. Moreover, it is socially looked down on. The high percentage of widowhood is a partial reflection of high adult male mortality. This figure may be an underestimate of the "true" figure because of the incidence of early remarriage of widows. The percentages of the widowed, and divorced and separated women at one point of time, however, do not reflect in a "true" sense the incidence of marital dissolution.

TABLE 3.1

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Marital Status and Duration of Marriage: BFS, 1976

Duration of marriage	Currently married		Widowed		Divorced and separated		Ever married	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
< 10	1.11	1.44	2.13	2.14	0.68	1.43	1.11	1.47
10-19	4.07	4.37	4.48	4.07	2.40	3.38	4.07	4.31
20 +	6.94	6.92	6.20	6.35	5.80	3.50*	6.84	6.84
Observed Mean	3.96 (4469)	3.88 (1303)	5.05 (388)	4.46 (131)	1.29 (167)	1.96 (55)	3.96 (5024)	3.86 (1489)
Standardised Mean	3.96	4.17	4.22	4.13	2.90	2.74	3.93	4.14

NOTE: * Less than ten cases in the cell.

In both the rural and urban areas, as might be expected, the average fertility of divorced and separated women is much lower than that of either the currently married women or widows (Table 3.1). However, the fertility of widows is unexpectedly high and higher than that of any other group. This unexpected finding may be the result of the differences between widows and others in terms of their present age or marital duration of life. It is apparent from Table 3.2 that there are substantial differences in the distributions of women by marriage duration and marital status. When the differences in the distributions of duration of marriage are controlled, the fertility of widows still remains higher than that of others in the rural area and becomes equal to the fertility of currently married women in the urban area. However, the differences between the standardised means narrow irrespective of the place of residence.

TABLE 3.2

The Distribution of Ever Married Women Aged 10-49, By Marital Status and Duration of Marriage: BFS, 1976

Duration of marriage	Currently married		Widowed		Divorced and separated	
	Rural	Urban	Rural	Urban	Rural	Urban
< 10	34.8	39.8	14.2	21.4	76.0	72.7
10-19	33.1	33.4	33.5	43.5	18.0	23.6
20 +	32.1	26.8	52.3	35.1	6.0	3.6
TOTAL	100.0 (4469)	100.0 (1303)	100.0 (388)	100.0 (131)	100.0 (167)	100.0 (55)

There are also substantial differences in the age distributions of the women classified by marital status (Table 3.3). When the mean numbers of children ever born to women classified by marital status and age are compared, currently married women are found to be more fertile than widows and much more fertile than divorced

and separated women of the same age group (Table 3.4) in both the rural and urban areas. Another striking point is that as age increases, the difference in mean parity between currently married women and others also increases. When standardised for age, currently married women become the highest parity group, divorced and separated women, the lowest parity group, and the widows take the intermediate position. This pattern holds for both the rural and urban women.

TABLE 3.3

The Distribution of Ever Married Women Aged 10-49, By Marital Status and Current Age: BFS, 1976

	Currently married		Widowed		Divorced and separated	
Current age	Rural	Urban	Rural	Urban	Rural	Urban
10-19	22.1	19.5	1.3	1.5	47.3	20.0
20-29	40.0	43.4	12.6	20.6	33.5	54.6
30-39	22.6	23.4	29.9	29.0	10.8	20.0
40-49	15.4	13.7	56.2	48.9	8.4	5.4
TOTAL	100.0 (4469)	100.0 (1303)	100.0 (388)	100.0 (131)	100.0 (167)	100.0 (55)

It is important to mention here that there is little or no difference between the mean parity of currently married and ever married women by duration of marriage (Table 3.1). This is due to the small representation of widowed, and divorced and separated women in the group of ever married women. Thus the analysis based on information obtained from the ever married women, instead of currently married women is justifiable.

TABLE 3.4

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Current Age and Marital Status: BFS, 1976

Current age	Currently married		Widowed		Divorced and separated	
	Rural	Urban	Rural	Urban	Rural	Urban
10-19	0.65	0.79	1.20*	1.00*	0.32	0.55
20-29	3.19	3.01	3.06	2.48	1.52	1.50
30-39	6.20	6.08	5.23	4.71	3.17	3.55
40-49	7.47	7.29	5.48	5.25	3.50	6.00*
Observed Mean	3.96 (4469)	3.88 (1303)	5.05 (388)	4.46 (131)	1.29 (167)	1.96 (55)
Standardised Mean	4.12	4.02	3.60	3.18	2.00	2.58

NOTE: * Less than ten cases in the cell.

3.2 Number of Marriages and Fertility

In the rural area of Bangladesh, 88.4 per cent of the currently married women, 78.6 per cent of the widows, and 68.3 per cent of the divorced and separated women are found to be married only once. In the urban area, on the other hand, 92.0 per cent of the currently married women, 80.9 per cent of the widows, and 67.3 per cent of the divorced and separated women are found to be married only once. The percentage of women married more than once is, therefore, much lower than the percentage of women married once, whatever may be the status of marriage and place of residence.

It is evident that in both the rural and urban areas (Table 3.5): (i) the mean parities of currently married and only once married women are slightly higher than those of currently married and more than once married women; (ii) there is no difference in mean parities of widows married only once and widows married more than once; (iii) the mean parities of divorced and separated women who married only once are much lower than those of divorced and separated

women married more than once; (iv) the mean parities of widows are much higher than those of currently married women or divorced and separated women whether they are married once or more than once.

TABLE 3.5

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Marital Status and Number of Times Married: BFS, 1976

Number of times married	Currently married		Widowed		Divorced and separated	
	Rural	Urban	Rural	Urban	Rural	Urban
1	3.99	3.90	5.04	4.47	0.76	1.49
2 +	3.76	3.67	5.08	4.40	2.43	2.94

The standardised mean parities for widowed, and divorced and separated women by the number of times married and rural-urban place of residence are not considered. This is because the observed mean parities which would participate in the process of direct standardisation are based on such small cell frequencies that any result obtained would be misleading.

The differences in mean parities of currently married women by the number of times married become wider after being standardised for duration of marriage. This pattern of the relationship between fertility and the number of marriages of currently married women is not in deviation from the normal pattern. Given the fact that the effect of duration of marriage is equal, marital dissolution will interrupt childbearing in a society where it is permitted only within marriage and as a consequence lead to lower fertility.

3.3 Consummation of Marriage and Fertility

Another factor which may cause variability in fertility of women in Bangladesh is consummation of marriage. From information regarding consummation of marriage, collected only for currently

married women, it was found that 78.3 per cent of the currently married women in the rural area and 82.7 per cent of the currently married women in the urban area started living with their husbands immediately after the marriage (Table 3.6). The mean parities of wives in the "consummated" group and of those in the "not consummated" group become equal when the effect of duration of marriage is controlled. This does not support the general expectation that women who consummated immediately after the marriage would have higher mean parity than those who did not. Again this would depend on the time interval between the wedding ceremony and the beginning of marital sexual relations. Customarily a girl does not start living with her husband if she is married before attaining puberty. She stays with her parents until after her first menstruation. Therefore any comparison between mean parities of those who consummated and those who did not immediately after the marriage should exclude those who did not menstruate before marriage. Unfortunately, no data are available on this aspect.

TABLE 3.6

Mean Number of Children Ever Born to Currently Married Women Aged 10-49, By Duration of Marriage and Consummation of Marriage: BFS, 1976

	Consummated		Not consummated	
Duration of marriage	Rural	Urban	Rural	Urban
< 10	1.11	1.43	1.15	1.44
10-19	4.17	4.42	3.74	4.11
20 +	6.88	6.81	7.08	7.24
Observed Mean	3.80 (3498)	3.71 (1077)	4.54 (971)	4.69 (226)
Standardised Mean	3.98	4.15	3.91	4.19

NOTE: "Consummated" group includes those women who started living with their husbands immediately after the marriage.

3.4 Childlessness and Fertility

Childlessness may result either from primary or voluntary sterility. The difference between primary and voluntary sterility is that the former is not planned while the latter is planned or induced. It is difficult to ascertain whether the husband or the wife is primarily sterile, but it is easy to detect who is voluntarily sterile. Childlessness may therefore happen due to either or both the partners. It is one of the causes of differentials in fertility and in combination with the increase in spinsterhood it accounts for a greater amount of reduction in fertility.

The percentage of childless women by marital status as obtained from the BFS data reveals that the divorced and separated women have the highest percentage childless while the widows have the lowest percentage childless in both the rural and urban areas (Table 3.7). Here the childless women include only those who did not bear any live births.

TABLE 3.7

The Distribution of Childless Women by Marital Status and Duration of Marriage: BFS, 1976

Duration of marriage	Currently married		Widowed		Divorced and separated	
	Rural	Urban	Rural	Urban	Rural	Urban
< 10	89.9	88.4	40.0	62.5	94.7	100.0
10-19	6.4	6.1	26.7	12.5	5.3	0.0
20 +	3.7	5.5	33.3	25.0	0.0	0.0
Total Childless	100.0 (644)	100.0 (164)	100.0 (15)	100.0 (8)	100.0 (75)	100.0 (10)
Total Women	(4469)	(1303)	(388)	(131)	(167)	(55)
% Childless	14.4	12.6	3.9	6.1	44.9	18.2

3.5 Age at Marriage and Fertility

Age at marriage is an important factor in determining the average fertility of women. It is one of the "intermediate variables", through which any social or cultural factor affecting fertility must operate (Davis and Blake, 1956). Education, for example, is believed to have a depressing effect on fertility through age at marriage. In other words, if one takes two groups of women, educated and uneducated, one would expect and may find that educated women have lower fertility than noneducated women. If the fertility rates of these two groups are further investigated by age at marriage, one may surprisingly note that the observed differences between fertility of educated and non-educated women at each age at marriage either diminish or become negligible. In this situation, one may get tempted to conclude that education itself does not affect fertility, rather it is the age at marriage through which education operates on fertility. The simple mechanism may be that educated women marry at late ages, due to which their overall fertility becomes lower than that of noneducated women who marry at earlier ages, quite often at the beginning of reproductive life.

The reproductive life of a woman is delimited physiologically by menarche - the onset of menstruation, and menopause - the cessation of menstruation. The effective duration of reproductive life, between these two extremes, is determined by behavioural and biological factors. Behavioural factors include, among others, marriage and divorce, celibacy and voluntary sterility while biological factors include, among others, fecundity, temporary or permanent sterility and death of either spouse. Assuming the effects of other factors to be constant, one can postulate that the lower the average age at marriage, the higher the average fertility and vice-versa. This hypothesis would refer to a society where sexual intercourse is permitted only within marriage or where sexual union is relatively stable and comparable (Yaukey, 1973). Age at marriage is also related to fecundity. "Late marriage eliminates fecund exposure, whereas early marriage may prejudice fecundity through morbidity attributable to premature exposure" (Ryder, 1959:415-416). The increase in age at marriage may tend, on the other hand, to raise fertility by reducing the incidence of reproductive impairments associated with early

marriages. Women marrying at older ages may also try to compensate for the loss of their reproductive life by bearing children at relatively shorter intervals. This deliberate attempt to compensate for the reduction in the reproductive period is most likely to be made in a country like Bangladesh where large family size and family size norms are still prevalent. Data from certain rural areas in India support this impact of late marriage on fertility in that for later ages the fertility rates are uniformly higher on the average among women married at a later age (Rele, 1962).

Nevertheless, there is considerable evidence to suggest that age at marriage is negatively associated with fertility of women in the Indian sub-continent. By using stable population techniques, Coale and Tye (1961:645) have demonstrated that "postponement of marriage can contribute substantially to reduction in birth rates and population growth even when completed size of family is not reduced and that this contribution is potentially greatest in those countries which have the highest fertility and low average age of marriage". Driver (1963) has found an inverse relationship between age at marriage and fertility of married women in the Nagpur District, India. Agarwala (1967) estimated in 1965 that the birth rate would decline by as much as 29 per cent in 1991-92 if Indian women married at a mean age slightly higher than 19, instead of the present average of 15.6 Sadiq (1967) has demonstrated that in Pakistan, the advancement of minimum age at marriage by about five years, will result in an immediate reduction in birth rate as well as a permanent decline.

In Bangladesh, age at first marriage of females is fairly low. The median age at marriage of women aged 10-49, as evident from the BFS data, does not exceed 13 years in both the rural and urban areas (Table 3.8). Since ex-nuptial births are socially looked down on and religiously prohibited and since contraception is not widely and expertly practised, the low age at marriage may contribute substantially to high fertility in Bangladesh. Women who marry at ages below 12 years are found to average 1.8 more children in the rural area and 1.4 more children in the urban area than women who marry at ages 16 years and over. A different pattern emerges when the intervening variable "duration of marriage" is controlled. For the purpose of direct standardisation, the distribution of the weighted national sample of the respondents by duration of marriage has been

employed. It is apparent that women who marry at ages below 12 years show the lowest mean parity in both the rural and urban areas after the effect of the duration of marriage is removed. In the rural area, the mean parity remains more or less stable, whereas in the urban area it tends to show a negligible decrease as age at marriage increases from 12 years. However, when the differences in age distribution of women are controlled, the mean parities decrease significantly as age at marriage increases from 12 years. Here again, the mean parity of women married before 12 years tends to be lower than that of women married at ages 12-13, irrespective of the place of residence. Two points become obvious from these findings: (i) the duration of marriage accounts for a large variation in fertility by age at marriage; and (ii) the females who are married at ages below 12 years become less fertile if either the effects of the differences in duration of marriage or age are held constant.

TABLE 3.8

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, by Age at Marriage and Rural-Urban Place of Residence: BFS, 1976

Age at marriage	Rural				Urban			
	N	O	A	B	N	O	A	B
< 12	1534	4.68	4.10	3.59	337	4.47	3.96	3.72
12-13	1817	4.03	4.18	4.12	438	4.34	4.35	4.40
14-15	1144	3.35	3.85	4.09	356	3.53	3.89	4.27
16 +	529	2.92	3.16	4.00	358	3.04	3.11	4.12
Total	5024	3.96	3.97	3.94	1489	3.86	3.85	4.15

NOTE: N = Number of cases (respondents)
O = Observed mean parity
A = Age-standardised mean parity
B = Duration of marriage-standardised mean parity

By controlling the duration of marriage and looking at the patterns of the relationship between age at marriage and fertility for different socio-economic characteristics, the following features become evident (Tables 3.9 and 3.10).

(i) Both in the rural and urban areas, the mean parities of women married at ages below 12 years are less than those of women married at ages 12-13 years for different socio-economic groups. In the rural area, the minimum difference is 0.4 and the maximum difference is 0.7 between parities of women married at ages below 12 years and at ages 12-13 years respectively. In the urban area, the differences between parities of women married at ages below 12 years and at ages 12-13 years by socio-economic characteristics range from 0.2 to 1.2.

(ii) In the rural area, the mean parities remain the same or tend to show a negligible decrease as age at marriage increases from 12 years for all the socio-economic groups except those who have primary education, who belong to the rich group, whose husbands have primary education, and whose husbands are in white-collar occupations. In the urban area, also, the mean parities of different socio-economic groups except non-Muslims tend to show either a decreasing trend or no trend at all as age at marriage increases from 12 years. However, in the urban area, a shift from age at marriage of 12-13 years to 16 years and over produces a decrease of not less than 0.5 of a child for women who have urban childhood background, who are Muslims, whose husbands have rural childhood background, whose husbands are in white-collar occupations, and who belong to the rich class.

To examine the socio-economic differentials in fertility by age at marriage, the technique of direct standardisation is again employed with a view to removing the differential effect of the duration of marriage. Here, the distribution of the weighted national sample of ever-married women by age at marriage cross-classified by duration of marriage is taken as the standard distribution (see Appendix Table B.3). So unlike other cases, here, four standard populations were used for the purpose of direct standardisation. By comparing the overall mean parities of rural and urban women at different groups of age at marriage, it can be seen that the urban fertility is higher than the rural one for all groups except the group whose age at marriage is less than 12 years (Tables 3.11 and 3.12).

TABLE 3.9

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Age at Marriage and Selected Socio-Economic Characteristics, Standardising for Duration of Marriage in Rural Bangladesh: BFS, 1976

Selected socio-economic characteristics		Age at marriage			
		< 12	12-13	14-15	16+
All women		3.59	4.12	4.09	4.00
Childhood place of wife:	Rural	3.57*	4.12*	4.08*	4.00*
	Urban	5.15	3.96	5.19	4.00
Childhood place of husband:	Rural	3.59*	4.12*	4.09*	3.97*
	Urban	3.23	3.93	4.20	5.49
Religion:	Muslim	3.60	4.13	4.13	4.08
	Non-Muslim	3.55	4.03	3.92	3.83
Education of wife:	Uneducated	3.61	4.14	4.06	3.97
	Primary	3.50*	4.03*	4.20*	4.07*
	Secondary or more	1.95	3.70	4.07	4.39
Education of husband:	Uneducated	3.59	4.10	3.96	3.96
	Primary	3.67	4.14	4.30	3.85
	Secondary or more	3.46	4.19	4.21	4.20
Working status of wife:	Non-working	3.64	4.14	4.12	4.06
	Working	3.42	4.05	3.93	3.77
Occupation of husband:	Unclassified	3.33	3.96	3.76	3.85
	White-collar	3.53	3.87	4.26	4.14
	Agricultural (own land)	3.70	4.28	4.05	4.13*
	Landless agricultural	3.56	4.12	4.32	3.98*
	Production & related	3.44	4.01	3.90	3.28
Economic status:	Poor	3.60	4.07	4.02	3.95
	Rich	3.54	4.24	4.26	4.13

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

TABLE 3.10

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Age at Marriage and Selected Socio-Economic Characteristics, Standardising for Duration of Marriage in Urban Balgladesh: BFS, 1976

Selected socio-economic characteristics		Age at marriage			
		< 12	12-13	14-15	16+
All women		3.72	4.40	4.27	4.12
Childhood place of wife:	Rural	3.67	4.37	4.31	4.38
	Urban	3.95	4.48	4.19	3.77
Childhood place of husband:	Rural	3.71	4.45	4.30	4.03
	Urban	3.89	4.32	4.23	4.35
Religion:	Muslim	3.72*	4.45	4.37	4.02
	Non-Muslim	3.65	4.00	3.86	4.43
Education of wife:	Uneducated	3.74	4.35	4.30	4.28
	Primary	3.84*	4.53*	4.31*	4.45*
	Secondary or more	3.52	4.34	3.91	3.79
Education of husband:	Uneducated	3.69	4.30	4.04	4.15*
	Primary	3.74	4.29	4.23	4.26
	Secondary or more	3.87	4.65	4.52	4.04
Working status of wife:	Non-working	3.81	4.41	4.31*	4.21*
	Working	3.39	4.27	3.97	3.68
Occupation of husband:	Unclassified	3.66	4.08	4.83*	4.30*
	White-collar	3.43	4.58	4.53	4.08
	Agricultural (own land)	4.18*	4.22*	4.18*	4.73*
	Landless agricultural	3.91	4.73	3.50	2.75*
	Production & related	3.76	4.01	3.76	4.67
Economic status:	Poor	3.62	4.15	4.15	4.20
	Rich	3.91	4.67	4.37	4.07

NOTE: * Less than ten cases in one of the cells when classified by duration of marriage.

TABLE 3.11

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Age at Marriage and Selected Socio-Economic Characteristics, Standardising for Duration of Marriage[a] (Cross-Classified by Age at Marriage) in Rural Bangladesh: BFS, 1976

Selected socio-economic characteristics		Age at marriage			
		< 12	12-13	14-15	16+
All women		4.67	4.04	3.34	2.90
Childhood place of wife:	Rural	4.65*	4.04*	3.33*	2.90*
	Urban	5.92	3.90	4.22	2.98
Childhood place of husband:	Rural	4.68*	4.04*	3.34*	2.87*
	Urban	3.89	3.85	3.55	4.39
Religion:	Muslim	4.68	4.05	3.37	3.37
	Non-Muslim	4.60	3.93	3.25	2.81
Education of wife	Uneducated	4.68	4.05	3.31	2.91
	Primary	4.52*	3.95*	3.44*	2.97*
	Secondary or more	2.53	3.55	3.35	2.93
Education of husband:	Uneducated	4.66	4.01	3.24	2.85
	Primary	4.74	4.06	3.46	2.92
	Secondary or more	4.55	4.10	3.47	2.99
Working status of wife:	Non-working	4.74	4.05	3.36	2.93
	Working	4.36	4.00	3.28	2.85
Occupation of husband:	Unclassified	4.37	3.90	3.12	2.80
	White-collar	4.53	3.78	3.55	2.95
	Agricultural (own land)	4.82	4.20	3.28	3.07*
	Landless agricultural	4.55	4.03	3.47	2.82*
	Production & related	4.46	3.89	3.20	2.36
Economic status:	Poor	4.66	3.98	3.28	2.88
	Rich	4.67	4.16	3.49	2.34

NOTE: [a] Unlike elsewhere, here the standard population is the distribution of the weighted national sample of respondents by age at marriage and duration of marriage. Thus comparisons are valid only within columns.

* Less than ten cases in one of the cells when classified by duration of marriage and age at marriage.

TABLE 3.12

Mean Number of Children Ever Born to Ever Married Women Aged 10-49, By Age at Marriage and Selected Socio-Economic Characteristics, Standardising for Duration of Marriage[a] (Cross-Classified By Age at Marriage) in Urban Bangladesh: BFS, 1976

Selected socio-economic characteristics		Age at marriage			
		< 12	12-13	14-15	16+
All women		4.65	4.31	3.58	3.08
Childhood place of wife:	Rural	4.56	4.28	3.62	3.30
	Urban	4.95	4.39	3.50	2.81
Childhood place of husband:	Rural	4.62	4.36	3.62	2.98
	Urban	4.90	4.24	3.53	3.31
Religion:	Muslim	4.63*	4.36	3.66	3.01
	Non-Muslim	4.78	3.95	3.26	3.30
Education of wife:	Uneducated	4.64	4.27	3.62	3.15
	Primary	4.95*	4.44*	3.59*	3.54*
	Secondary or more	4.41	4.24	3.30	2.79
Education of husband:	Uneducated	4.51	4.21	3.42	2.99*
	Primary	4.70	4.21	3.52	3.22
	Secondary or more	4.99	4.56	3.75	3.05
Working Status of wife :	Non-working	4.81	4.32	3.61*	3.11
	Working	4.10	4.18	4.35	2.93*
Occupation of husband :	Unclassified	4.53	4.01	4.03*	2.91*
	White-collar	4.50	4.49	3.79	3.14
	Agricultural (own land)	5.21**	4.08*	3.53**	3.64**
	Landless agricultural	4.45	4.64	3.00	1.93*
	Production & related	4.58	3.97	3.14	3.27
Economic status:	Poor	4.48	4.07	3.48	3.15
	Rich	4.93	4.57	3.67	3.04

NOTE: [a] Unlike elsewhere (except Table 3.11), here the standard population is the distribution of the weighted national sample of respondents by duration of marriage and age at marriage. Thus comparisons are valid only within columns.

* Less than ten cases in one of the cells when classified by duration of marriage and age at marriage.

However, the difference is not greater than 0.3 of a child. Similar pattern is observed when the mean parities of women classified by their childhood place of residence and the childhood place of residence of their husbands are compared. In the urban area, for age at marriage 16 years and over, women having an urban childhood background have significantly lower fertility than those with a rural childhood background. For the same age at marriage, urban women with husbands having an urban childhood background have higher parity than those with husbands having a rural childhood background.

Except for the highest age at marriage the mean parities of Muslim women tend to be equal to those of non-Muslim women in the rural area for all the ages at marriage. In this group the difference between mean parities of Muslim and non-Muslim women is 0.6, indicating that Muslim fertility is about 18 per cent higher than non-Muslim fertility. In the urban area, in contrast, Muslim fertility is lower for the highest age at marriage (16 years or more) and higher for other ages at marriage than non-Muslim fertility.

The education of the wife does not appear to make any significant difference in the mean parity at different ages at marriage in the rural area. In the urban area, however, women having primary education tend to have higher fertility than noneducated women at the lowest and the highest ages at marriage. The nubmer of highly educated women in each cell of the duration of marriage groups cross-classified by age at marriage is very small in both the rural and urban areas. Therefore, no comparison by marriage cohort is made use of though the results are given in the tables. The higher education of the husband, on the other hand, seems to have a positive effect on fertility of women married at ages below 16 years in the urban area and at ages 14-15 years in the rural area.

Working women married at ages below 12 years average 0.4 fewer children in the rural area and 0.7 fewer children in the urban area than non-working women. At the higher ages at marriage in both the rural and urban areas, working status does not create any differences in mean parities.

The mean parities of women classified by occupational categories of their husbands do not differ significantly at all ages at marriage. In the rural area, women with husbands in agricultural

occupations (own land) have the highest mean parity at age at marriage less than 12 years and 12-13 years. The lowest mean parity groups at these ages at marriage are women with husbands of unclassified occupations and women with husbands of white-collar occupations respectively. At age at marriage 14-15 years, women with husbands in white-collar occupations have the highest mean parity while women with husbands in unclassified occupations have the lowest mean parity. At the highest age at marriage group, the differences in mean parity by occupational category of husband are very small. In the urban area, there is no difference in mean parity of women by occupation of husband at age at marriage below 12 years. For other ages at marriage, except the last one, the mean parity of women with husbands in white-collar occupations is higher than that of any other occupation.

The economic status of women produces some differences in mean parity at different ages at marriage. In the rural area, rich women tend to have either equal or higher mean parity than poor women at age at marriage below 16 years. At the age at marriage group 16 years and over, rich women average 0.5 fewer children than poor women. In the urban area, on the other hand, rich women have consistently higher mean parity than poor women at age at marriage less than 16 years.

CHAPTER 4

A PATH ANALYSIS OF DIFFERENTIAL FERTILITY

4.1 Introduction

In the foregoing chapters, an attempt was made to investigate how the socio-economic and demographic variables were associated with fertility in Bangladesh. The format of the analysis was mainly two-way classifications, controlling for duration of marriage and on some occasions, current age of ever married women. No control was made for other correlated variables or for one variable which is the causal effect of another. This chapter will be devoted to the incorporation of all the selected socio-economic and demographic variables in a causal manner and determining the direct and indirect contributions of each of these variables to fertility levels (measured by number of children ever born). The method of analysis is commonly known as *Path Analysis*.

Path analysis was originally formulated by Wright (1921, 1934, 1960) and explicated more recently by Duncan (1966), Land (1969), and Blalock (1971). As a statistical technique, it is no more than conventional regression analysis with certain assumptions about linearity, additivity, and causality (Holsinger and Kasarda, 1976:175). It provides algorithms for decomposing zero order correlations among variables in causal models into direct and indirect components.

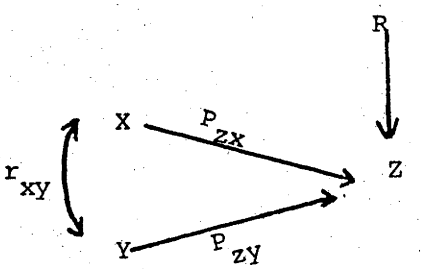
"The initial assumption for path analysis must be the specification of the causal (or temporal) ordering between the variables of the model. The data themselves cannot give us any assistance either for this or for the selection of the variables to be included in the model. The validity of these assumptions cannot be evaluated from the data; external criteria or substantive theory must provide the basis for this stage" (Kendall and O'Muircheartaigh, 1977:11). Knowledge of causal relationships can help determine the ordering of the variables in the model. For example, age can be considered a variable preceding fertility. A diagrammatic representation of the proposed model may be used to formulate the structural equations and to have a critical evaluation of the results.

The second assumption involved is that the relationships between the variables are linear and additive. Such assumptions may not hold exactly in reality, and although nonlinear and interaction effects are not included in the model, they can be included in it. The relationships between the variables are expressed in a path analysis diagram by straight, single-headed arrows. Each arrow points in the direction of the assumed effect. The straight lines with single arrows are also meant to indicate a unidirectional relationship. The curved, double-headed arrows indicate the correlations between variables for which no causal implications can be made. They also indicate mutual dependence of the variables.

An example of a path diagram is given in Figure 4.1, where it is assumed that Z is dependent on two independent or "exogenous" variables: X and Y. The curved double-headed arrow between X and Y indicates that these two variables are assumed to be correlated but that neither is the cause of the other. The straight arrows from X to Z and from Y to Z express that these two variables, in part, determine Z. Under the above assumptions it is conceivable that a unit change in X would have the same effect on Z whatever the values of the other variables. The variable Y would act on Z in a similar way.

FIGURE 4.1

Hypothetical Three-Variable Path Diagram



The third assumption in path analysis is that there is complete determination of the dependent variables involved. This is satisfied by the inclusion of variables representing residual factors. They are not standard disturbance terms, but variables not included in the model either purposely or accidentally, resulting from measurement error, and departures of true relationships from linearity and addivity. In Figure 4.1, such a residual factor is represented by R, which is residual to the dependent variable Z. There are no

residuals to ultimate (exogenous) variables. The assumptions regarding residual factors are that they have a mean value of zero and they are uncorrelated with all prior variables and hence with each other. A further assumption is that of homoscedasticity (equal dispersion or spread) of the residual factors. "The violation of the homoscedasticity assumption produces inefficient, but unbiased, estimates of the parameters. There are strategies for handling such situations; but unless the exact form of the heteroscedasticity is known they cannot be handled by an orthodox regression program" (Macdonald, 1977:85).

The last assumption is that the variables are measured at least on an interval scale. However, there are exceptions to this constraint. Binary variables (taking values of 0 and 1) can be included and treated as interval level variables. As dependent variables they can generate heteroscedasticity problems (Goldberger, 1964:249), but as predictors they are invaluable. Binary variables can also be assigned numerical scores, because the regression coeffocients being independent of origin, will remain unaffected. Ordinal variables can also be used in path models.

Under the conditions laid down as above, if X_2 is assumed to be dependent on X_1; X_3 on X_1 and X_2; and Y on X_1, X_2, and X_3; then the system of equations can be written as:

$$\begin{aligned} X_2 &= B_{21}X_1 + B_{2u}X_u \\ X_3 &= B_{31}X_1 + B_{32}X_2 + B_{3v}X_v \\ Y &= B_{o1}X_1 + B_{02}X_2 + B_{03}X_3 + B_{0w}X_w \end{aligned} \qquad (1)$$

where X_u, X_v and X_w are the error terms.

Without loss of generality, if all the variables are expressed in standard scores (that is, with zero mean and unit variance), then the model (1) can be written as:

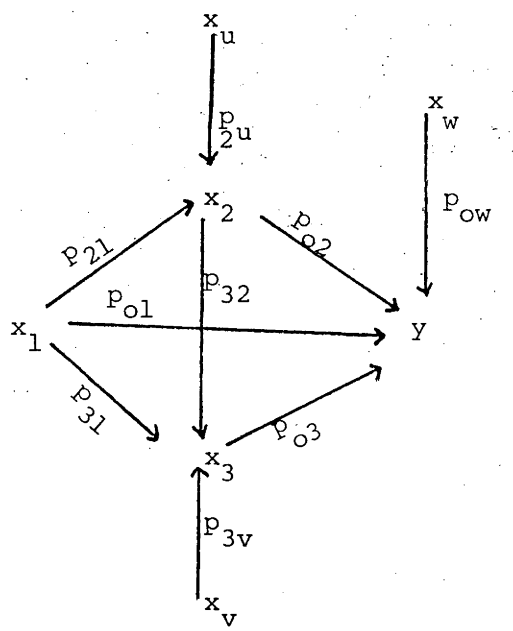
$$\begin{aligned} x_2 &= P_{21}x_1 + P_{2u}x_u \\ x_3 &= P_{31}x_1 + P_{32}x_2 + P_{3v}x_v \\ y &= P_{01}x_1 + P_{02}x_2 + P_{03}x_3 + P_{0w}x_w \end{aligned} \qquad (2)$$

where x's and y are standardised variables and p's are standardised regression coefficients. These standardised regression coefficients are conventionally called *path coefficients*. They are usually denoted by P_{ij} where the first subscript identifies the dependent variable, the second the variable whose direct effect on the variable is measured by the path coefficient. A conventional path coefficient gives the proportion of the standard deviation of the dependent variable for which the independent variable is directly responsible. The residual path coefficient measures the proportion of the standard deviation of the dependent variable which is caused by unmeasured, extraneous variables.

The diagrammatic representation of the above model is shown in Figure 4.2. Two methods can be employed to estimate the path coefficients of this model. The first method involves the use of the observed zero order correlations between the variables in the system, while the second method applies the technique of ordinary least squares regression to the equations one by one. The second method of estimation has advantages over the first in that it recognises more explicitly the handling of sample data and that it provides estimates of the precision of the coefficients as well as a premise for testing hypotheses concerning them (Kendall and O'Muircheartaigh, 1977). Under the second method, the path coefficients in Figure 4.2 can be obtained by regressing x_2 on x_1, x_3 on x_1 and x_2, and y on x_1, x_2, and x_3. The residual path coefficients are the square roots of the residual variances in the three regressions.

FIGURE 4.2

Hypothetical Four-Variable Path Diagram



4.2 Variables in the Model

Eight variables will be employed in this path analysis. The names of the variables, their abbreviations and causal order are given in Table 4.1. The order of the variables contained in the listing below is temporal and partial. Each variable may be a cause (but not an effect) of some of the variables below it on the list. Similarly each variable may be an effect (but not a cause) of some of the variables above it on the list. The partial model is also known as an unsaturated model, stating that some of the variables are not dependent on all causally prior variables. The first three variables in the analysis ("Religion", "Childhood Place of Wife", and "Childhood Place of Husband"), are considered to be exogenous. They are not affected by any other variables included in the study. Except for children ever born, all of the other variables in the study will be treated as both causes and effects. How the variables are measured and how they are causally related will be dealt with in the next section.

TABLE 4.1

Variables Used in Path Analysis

Variable	Number	Abbreviation
Religion	1	REL
Childhood Place of Wife	2	CPW
Childhood Place of Husband	3	CPH
Education of Wife	4	EDW
Education of Husband	5	EDH
Age at Marriage of Wife	6	AMW
Duration of Marriage of Wife	7	DMW
Children Ever Born	8	CEB

Path diagrams will be constructed and analysed separately for urban, rural, and a weighted national sample of Bangladesh. The models may be termed as urban, rural and national models. The national model differs from the others in that it does not have the variables "Childhood Place of Wife", and "Childhood Place of Husband". Instead, it has a variable called "Residence" (RES). A score of zero is assigned to rural place of residence and a score of one to urban place of residence in this model. The order of the variables, however, will not change, though the number is reduced to seven.

It may have been informative to use three variables: "Occupation of Husband", "Working Status of Wife", and "Economic Status", in this path analysis because these variables may be assumed to affect some of the variables and be affected by some other variables in the given list. But the problem with these variables is that they are not measured on an interval scale and therefore, though numerical scores can be assigned to these variables, such a use of them would be invalid as dummy variables cannot be used as dependent variables in regression models. These variables are, therefore, excluded from the analysis in this chapter, though they were used in the preceding chapters.

Age is usually taken as an independent variable in path analysis. But it is so highly correlated (positive) with duration of marriage that its inclusion in the model may hinder the unique determination of the regression coefficients. Assuming that the effect of age on fertility is as good as that of duration of marriage, none of the models includes age as an explanatory variable.

Another important consideration in path analysis is the treatment of missing data. Missing data can be used in calculations if they can be manipulated effectively and especially if the sample size is not very large. In this analysis, missing cases have been eliminated from all calculations through listwise deletion. Thus, all means, standard deviations, correlations, and hence path coefficients are based on the same universe of data. After the elimination process, the sample size is reduced from 5024 to 4867 in the rural area and from 1489 to 1403 in the urban area. Since the reduced sample sizes are large enough, deletion of missing data is assumed not to introduce a bias into the estimates.

4.3 Measurement of the Variables and Choice of the Paths

4.3.1 Religion

It is usual practice to include religious affiliation in fertility analysis. Religion is assigned at birth and remains unchanged throughout the lifetime of a person. During the advent of Islam, people from other religious affiliations became Muslims, and during the period of British rule some Muslims and mainly low caste Hindus accepted Christianity. These days, there is hardly any incidence of conversion from one religion to another. Religion is, therefore, prior to childhood place of residence, education, age at marriage, fertility and virtually prior to every other variable in this analysis.

In this study religion is used as a dummy variable. Dummy variables can be used as point dichotomous variables in path analysis. If zero is assigned to non-Muslims and one to Muslims, the path coefficient will indicate what consequences will result from being a Muslim. For example, a positive path coefficient from religion to children ever born would indicate that other things being equal, Muslims have higher fertility than non-Muslims. In this analysis a score of one is assigned to Muslims and a score of zero to non-Muslims to examine the effect of being Muslim.

It can be stated that religion directly affects the following variables: "Education of Wife", "Education of Husband", "Age at Marriage of Wife", "Duration of Marriage" and "Children Ever Born". The rationale underlying the path from religion to children ever born can be traced from the discussion in Chapter 2 (Section 2.2.2). The remaining paths from religion are implicit in the differences between non-Muslims and Muslims in their values, beliefs, and attitudes towards life.

4.3.2 Childhood Place of Wife

Childhood place of wife, as noted earlier, is significant in differential fertility analysis. In addition to its direct effect on fertility, it may affect other variables which in turn operate on fertility. For purposes of this analysis, this variable has been dichotomised as rural (non-urban) versus urban. Here the score of one is assigned to urban childhood place and the score of zero to rural childhood place to uncover the effects of "urbanity".

It is assumed that childhood place of wife would directly affect her education, age at marriage, duration of marriage, and number of children ever born. Since the score of one is assigned to urban childhood place, it is reasonable to assume that women with urban childhood background would possess a higher education than women with a rural childhood background, other factors being constant. Similarly, women with an urban childhood background are more likely to (i) marry at older ages, (ii) experience either a shorter or longer duration of marital life, and (iii) bear less number of children. The paths extended from childhood place of wife, therefore, appear to be hypothetically valid.

4.3.3 Childhood Place of Husband

Like the childhood place of wife, childhood place of husband is dichotomised as rural and urban. A score of zero for rural and a score of one for urban childhood background will provide the effects of a shift from rural to urban childhood background of husbands. In line with the mechanisms involved in the causal relationship of childhood place of wife and other variables, it can be postulated that childhood place of husband partly determines his education, duration of marriage of his wife, and number of children born to his wife. It is also assumed that childhood place of husband itself is not affected by any of the above variables.

4.3.4 Education of Wife

Education here refers to the number of years of schooling. Although there was no direct question about the total number of years spent in acquiring education, this can be estimated from the highest class/grade passed. The category of "no formal education" is treated as zero year of schooling. So, the variable education, whether of wife or of husband, is measured by interval scale in this path analysis. In all there are fourteen measures including no schooling for both husband and wife.

Here it is assumed that the education of wife directly affects her age at marriage, duration of marriage and number of children ever born. How education affects fertility directly was pointed out in Chapter 2 (Section 2.2.3). No further elaboration of this matter will be pursued here.

That female age at marriage is a positive function of her education is well-documented. Young women attending high school or college are not usually married and they tend to be married at a later average age. It is also possible that female age at marriage partially affects her education. While attending school they get married and as a consequence terminate schooling to join their husbands. However, it is assumed that this phenomenon is less likely to happen and even if it is in operation, it makes the age at marriage higher than that of illiterate women. Therefore the causal path is postulated in the direction of education to age at marriage instead of age at marriage to education.

It is plausible that education of wife may affect her duration of marriage, either by shortening or lengthening it.

4.3.5 Education of Husband

Education of husband is converted to an interval scale like the education of wife. This variable is assumed to have an effect on the following variables: "Age at Marriage of Wife, "Duration of Marriage of Wife", and "Number of Children Ever Born".

Ample evidence exists justifying the positive association between husband's education and wife's age at marriage. A highly educated man will rationally think to marry a woman who is mature enough in terms of age, mental and physical development. In a broad sense it can be said that as educational level of the husband progresses, age at marriage of the wife rises monotonically. This does not necessarily mean that women who marry at later ages will definitely get higher educated husbands, but the fact that they may delay their marriages in the hope of getting better educated husbands. So, it is education of husband, which partly determines the age at marriage of wife. By extending paths from both husband's education and wife's education to age at marriage of wife, it would also be possible to examine the influence of one while controlling for the other.

4.3.6 Age at Marriage of Wife

Keeping other variables constant, it can be postulated that the lower the age at marriage the higher will be the duration of marriage of wife. Similarly, the lower the age at marriage the

higher will be the number of children ever born. The inclusion of paths from age at marriage of wife to her duration of marriage and number of children ever born needs no exemplification. This variable is measured by single years.

4.3.7 Duration of Marriage of Wife

It is assumed that the higher the duration of marriage the higher will be the number of children ever born. Age at marriage and duration of marriage are two important variables which determine fertility. Their inclusion in this path analysis will ensure the control for one while examining the influence of the other. Like age at marriage, duration of marriage of wife is also measured by single years.

4.3.8 Children Ever Born

It is assumed that this variable is the effect of all other variables in this analysis and that it does not affect any of the preceding variables.

4.4 Results

Under the assumptions given in the preceding section, 21 paths are shown for each of the urban and rural models, while 19 paths are shown for the national model. All the hypothesised path coefficients as estimated by SPSS subprogram REGRESSION are appended (Appendix Tables C.1, C.2, C.3), where the column variable is the presumed causal agent and the row variable is the dependent variable. One may wonder whether the population coefficients are non-zero or whether the values represent simple sampling fluctuations. This can be tested by employing either a t-test or an F-test for the individual raw regression coefficients (Li, 1964:106). Both tests will lead to the same conclusions. Here, the F-statistic which is returned by the regression program for each coefficient is compared with the theoretical value of F with appropriate degrees of freedom at a 5 per cent level of significance. If the computed value of F is greater than the theoretical value, a path coefficient is considered to be significant at the .05 level. Examination of Appendices C.1, C.2, and C.3, show that 17 paths are significant in the urban model, 13 in the rural model, and 16 in the national model. Following Loebner and Driver (1973) and admitting the fact that both Type I and Type II errors may be committed, a second path is performed by using only significant paths of the models. The discussion that follows is based on the results obtained by the significant paths only. It is worth mentioning here that the elimination of the nonsignificant paths has little or no effect on the magnitude of the significant paths.

Urban Model

Of the seven variables which were presumed to directly affect the number of children ever born in the urban area, five were found to have a statistically significant effect. They are religion, education of wife, education of husband, age at marriage of wife, and duration of marriage of wife (Table 4.2 and Figure 4.3). The direct effect of religion on children ever born is, $P_{8,1} = 0.039$. This means that if all other factors are held constant, Muslim women will have more children than non-Muslim women. The total effect of religion on children ever born is the correlation coefficient $r_{8,1} = -0.014$ (Appendix Table D.1) and the indirect effect of religion is the difference between the total effect and the direct effect, provided that the total covariation is causal or genuine. If the sum of the direct and indirect effects does not equal the total effect, then part of the total effect is taken as spurious. Path analysis thus provides at least a partial test of the causal closure of the relationship between any two variables. The negative indirect effect of religion operating on fertility through a network of compound paths, more than compensates for the positive direct effect and hence the total effect is negative.

TABLE 4.2

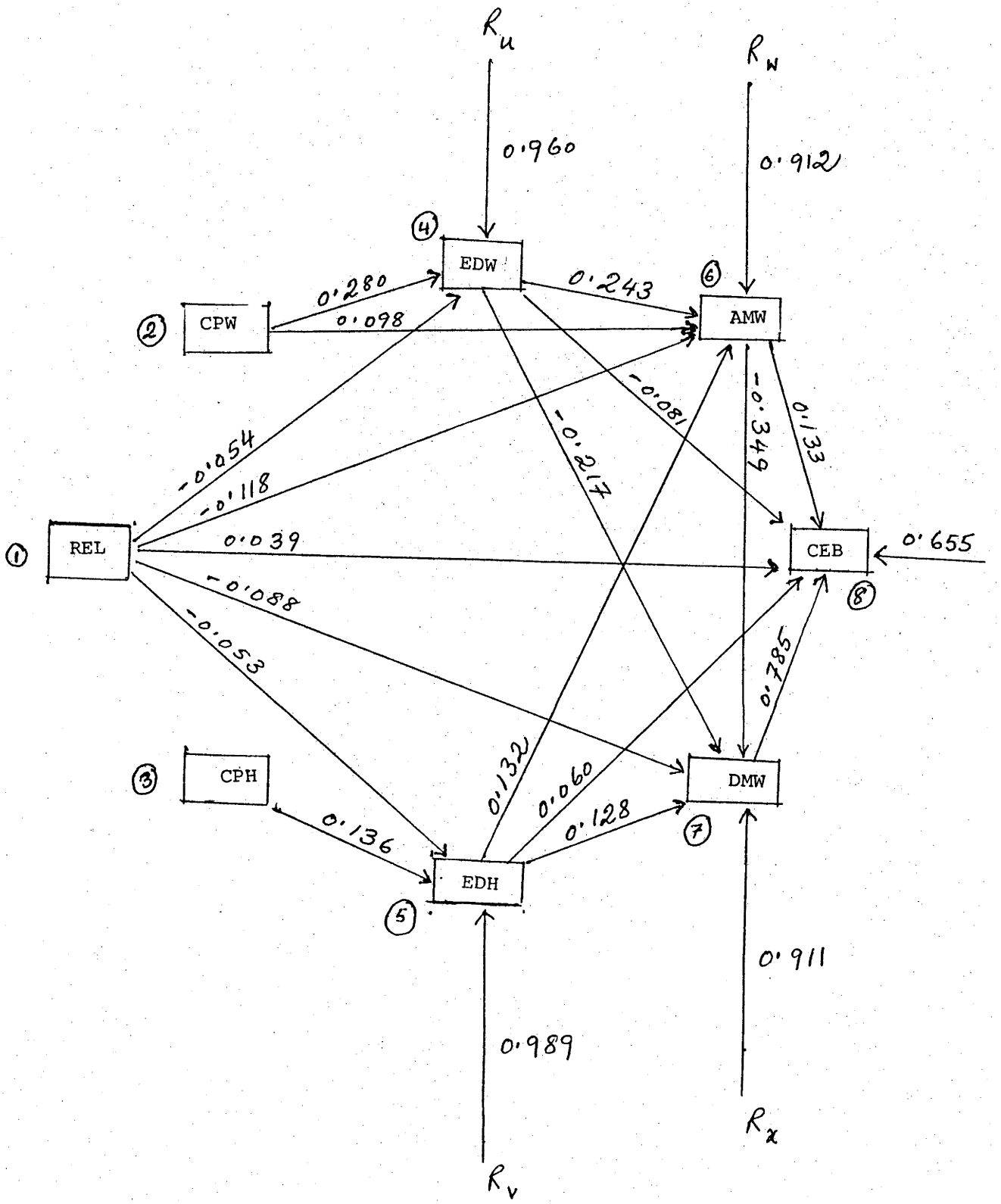
Significant Path Coefficients[a] After Recomputation, Urban Model

	Cause							
Effect	1	2	3	4	5	6	7	8
REL 1	..							
CPW 2	..	..						
CPH 3	..	..	..					
EDW 4	-054	380	..	..				
EDH 5	-053	..	136	..	..			
AMW 6	-118	098	..	243	132	..		
DMW 7	-088	..	..	-217	128	-349	..	
CEB 8	039	..	..	-081	060	133	785	..

NOTE: [a] Decimal points have been omitted; all entries should be divided by 1000.

FIGURE 4.3

Path Diagram of Direct and Indirect Significant Paths to Children Ever Born (CEB): Urban



The second variable which directly affects the number of children ever born in the urban area is education of wife. The direct path coefficient from education of wife to number of children ever born is, $P_{8,4} = -0.081$, while the correlation coefficient between the two variables is, $r_{8,4} = -0.182$. The indirect effect of education is much larger than the direct effect and the largest portion of the indirect effect is due to the compound path:

EDW ——————> DMW ——————> CEB

The value of this compound path is (-0.217) (0.785) = -0.170. The indirect effect of education of wife on fertility through other intervening variables is equal to -0.035. The sum of the direct and indirect effects thus exceeds the total effect, indicating the presence of spurious elements.

The third variable is the education of husband that bears a direct effect on the number of children ever born. The direct effect is, $P_{8,5} = 0.060$ and the indirect effect is 0.082. The positive value of both the direct and indirect effect indicates that education of husband is positively related to fertility. Here again, the sum of the direct and indirect effects exceeds the correlation coefficient, indicating the presence of spurious elements.

The fourth variable directly affecting number of children ever born is age at marriage of wife. It is interesting to note that the path coefficient is positive and equals $P_{8,6} = 0.133$. It tends to support the hypothesis that women marrying at older ages try to bear more children by shortening the birth intervals. It also lends support to the phenomena that women marrying at extremely young ages bear fewer children because of the reproductive impairments associated with early marriage and because of the adolescent sterility. The indirect effect of age at marriage on fertility through duration of marriage is, however, negative. The total effect of this variable is also negative since the indirect effect exceeds the direct effect.

The last and most important variable that directly affects number of children ever born is duration of marriage. It is most important in the sense that it accounts for the maximum variation in fertility. The value of the path coefficient $P_{8,7}$ is 0.785.

It is a common intervening variable through which other demographic and socio-economic variables operate on fertility. The variables that directly affect duration of marriage in the urban model are: "Religion", "Education of Wife", "Education of Husband", and "Age at Marriage of Wife". Three of these variables, namely: "Religion", "Education of Wife", and "Age at Marriage of Wife" have a negative direct effect on duration of marriage.

Rural Model

In this model only three variables: "Religion", "Age at Marriage of Wife", and "Duration of "Marriage of Wife" were found to have statistically significant direct effects on the number of children ever born (Table 4.3 and Figure 4.4). The direct effect of religion on the number of children ever born is positive and equals $P_{8,1} = 0.033$. The indirect effect of religion on the nubmer of children ever born operates through a complex network of compound paths. The sum of the values of the compound paths equals -0.026. Thus the sum of the direct and indirect effects of religion on fertility is positive and equals the correlation coefficient between the two variables (see Appendix Table D.2).

TABLE 4.3

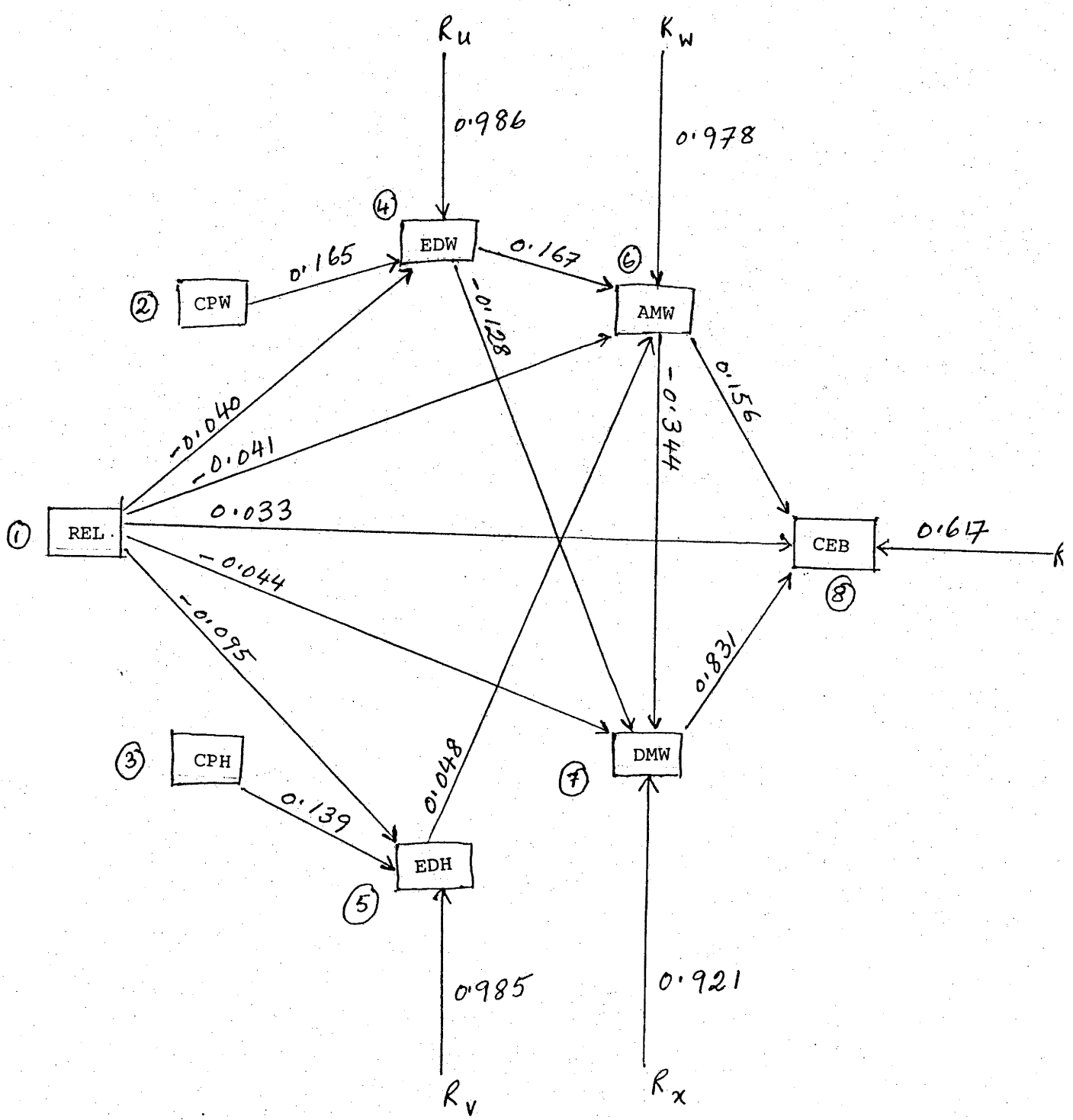
Significant Path Coefficients[a] After Recomputation, Rural Model

	Cause							
Effect	1	2	3	4	5	6	7	8
REL 1	..							
CPW 2	..	..						
CPH 3	..	..	..					
EDW 4	-040	165	..	..				
EDH 5	-095	..	139	..	..			
AMW 6	-041	..	..	167	048	..		
DMW 7	-044	..	..	-128	..	-344	..	
CEB 8	033	..	..	..	..	156	831	..

NOTE: [a] Decimal points have been omitted; all entries should be divided by 1000.

FIGURE 4.4

Path Diagran of Direct and Indirect Significant Paths to Children Ever Born (CED): Rural



The indirect effect of religion working through education of wife and in turn through age at marriage and then through duration of marriage indicates that for Muslim women the education is lower and hence the age at marriage is lower and hence the duration of marriage is higher and consequently the number of children ever born is higher. The indirect effect of religion working through education of wife and in turn through age at marriage of wife, on the other hand, indicates that Muslim fertility is lower.

The second variable directly affecting the number of children ever born in the rural model is age at marriage of wife. Its direct effect is $P_{8,6} = 0.156$, whereas the indirect effect working through duration of marriage is (-0.344) (0.831) = -0.286. The indirect effect thus more than compensates for the direct effect and as a result the total effect is negative. The variables that directly and/or indirectly affect age at marriage are, "Religion", "Childhood Place of Wife", "Childhood Place of Husband", "Education of Wife", and "Education of Husband".

The third variable that affects the number of children ever born directly in the rural area is "Duration of Marriage of Wife". Like the urban model, duration of marriage in the rural model contributes to the maximum variation in fertility. Its direct effect being $P_{8,7} = 0.831$, indicates that the longer the women are exposed to the risk of pregnancy the more children they will bear. It is a good measure of exposure to risk. Of the six variables hypothesised for affecting duration of marriage directly, three were found to be statistically significant. They are "Religion", "Education of Wife", and "Age at Marriage of Wife". Religion and education of wife also affect duration of marriage indirectly.

National Model

Unlike the rural and urban models, six variables were hypothesised to directly affect number of children ever born according to the national model. Out of them, only four demonstrated a statistically significant effect. They are: "Religion", "Education of Wife", "Age at Marriage of Wife", and "Duration of Marriage of Wife" (Table 4.4 and Figure 4.5).

The direct effect of religion on the number of children ever born is, $P_{7,1} = 0.033$. Religion operates on fertility indirectly through a complex network. The sum of the indirect effects equals

-0.026 and is much lower than the direct effect. This leads to the obvious conclusion that Muslim women have higher fertility than non-Muslim women in Bangladesh due to the direct effect of religion.

TABLE 4.4

Significant Path Coefficients[a] After Recomputation, National Model

	Cause						
Effect	1	2	3	4	5	6	7
REL 1	..						
RES 2	..	..					
EDW 3	-036	202	..				
EDH 4	-093	160	..	..			
AMW 5	-045	052	188	058	..		
DMW 6	-046	025	-124	..	-346	..	
CEB 7	033	..	-013	..	155	835	..

NOTE: [a] Decimal points have been omitted, all entries should be divided by 1000.

Both the direct and indirect effects of education of wife on the number of children ever born in Bangladesh are negative. While the direct effect equals $P_{7,3} = -0.013$, the indirect effect becomes -0.127. The indirect effect of education of wife on fertility commences through the following compound paths:

EDW ⟶ DMW ⟶ CEB

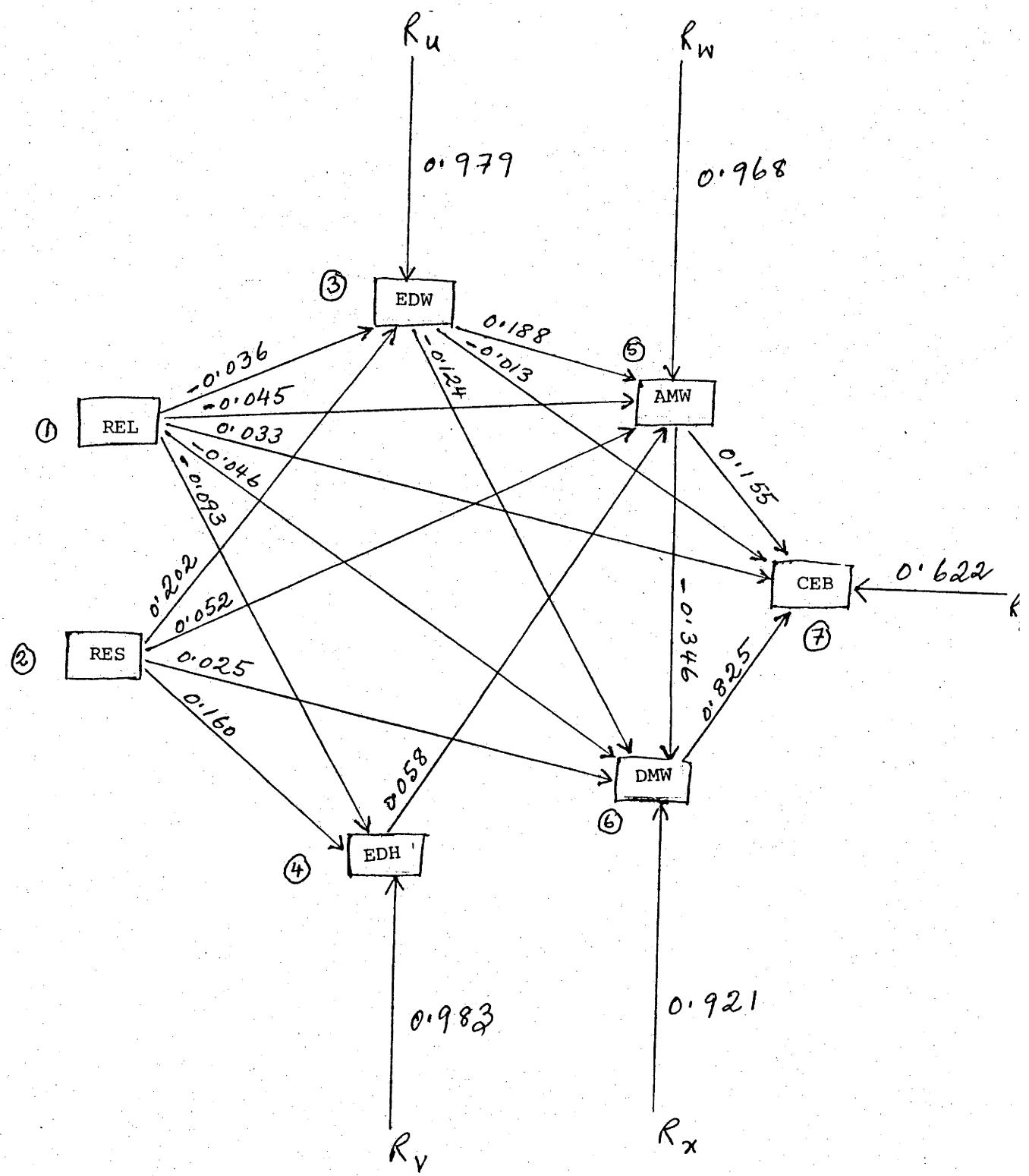
EDW ⟶ AMW ⟶ CEB

EDW ⟶ AMW ⟶ DMW ⟶ CEB

Age at marriage of wife, being affected directly and/or indirectly by religion, education of wife, place of residence, and education of husband, also affects the number of children ever born directly and indirectly. The direct effect is, $P_{7,5} = 0.155$, while the indirect effect through the duration of marriage is $(-0.346)(0.825) = -0.285$.

FIGURE 4.5

Path Diagram of Direct and Indirect Significant Paths to Children Ever Born (CEB): National



The variables that directly affect duration of marriage in the national model are "Religion", "Place of Residence", "Education of Wife", and "Age at Marriage of Wife". The effect of duration of marriage on the number of children ever born is direct and equals $P_{7,6} = 0.825$.

4.5 Conclusions

A common feature of the above three path models developed for analysing differential fertility in Bangladesh is that each of the variables, "Religion", "Age at Marriage" and "Duration of Marriage of Wife", has a positive direct effect on the number of children ever born. The effects of religion, duration of marriage and some other variables are certainly to be expected, but the effect of age at marriage is quite surprising. It is also interesting to note that none of the variables pertaining to husband has any direct effect on fertility in the rural and national models. Moreover, duration of marriage has the largest effect. The total effect of the socio-economic and demographic variables are, nonetheless, compatible with the findings obtained by different techniques in the preceding chapters.

The principal advantage of this analysis is that it not only gives the effects of a host of variables on fertility, but also portrays the mechanism involved. The sizes of the path coefficients from the residual factors suggest that the models formulated in this thesis should incorporate many other variables which directly or indirectly affect fertility. The results should therefore be taken with much caution. Moreover, the models are temporal and may not hold if the population distributions of the variables are changed. The most important disadvantage of this analysis is that it is dependent on an *a priori* causal scheme which may not be accepted wholly by other researchers. Another point to be noted here is that in some cases the total effect of a variable does not equal the correlation coefficient between this variable and the variable on which it is operating. This is due to the spurious correlation between the two variables.

CHAPTER 5

SUMMARY AND CONCLUSION

This study is based on a subset of data obtained from the Bangladesh Fertility Survey (BFS). The study had two main objectives. First, to determine whether fertility (number of children ever born alive) varies among women differentiated by their and their husbands' rural-urban background, and socio-economic status and by their marital status and ages at marriage. The second, to build up a structural model for fertility.

The rural-urban differential in fertility is negligible. The rural fertility is higher than the urban fertility when age is controlled, but the former is lower than the latter when duration of marriage is controlled. The urban childhood background of the women and their husbands has a potentiality to increase fertility. Compared by marriage cohort, the urban fertility becomes higher than the rural one in all cohorts except the cohort of less than 12 years. The exact reasons of these unexpected results are yet to be explored. However, in the absence of any valid evidence, better health and nutritional status, and the lack of "urbanism" may be held responsible for this.

The fertility of Muslims becomes higher than the fertility of non-Muslims when either age or duration of marriage is controlled in both the rural and urban areas of Bangladesh. Compared by education, Muslims show higher fertility than non-Muslims only at the primary level of education in the rural area. Compared by economic status, poor Muslims show higher fertility than poor non-Muslims in both the rural and urban areas, while there is no difference in fertility of Muslim and non-Muslim women who are rich. By taking marriage cohort it is seen that Muslim fertility tends to be higher than non-Muslim fertility in almost all the cohorts.

The education of wife, particularly beyond primary schooling has a tendency to decrease fertility. The education of husband, on the other hand, has a weak propensity to increase fertility. The education of wife and that of husband, however, do not make any differences in fertility jointly in both the rural and urban areas. When compared by marriage cohort, the education of wife does not seem to have any significant depressing effect on fertility in the rural area. In the urban area, the primary education of wife gets associated with higher fertility at the lowest and the highest ages at marriage.

The working women, whether in the rural or urban area, whether uneducated or highly educated, whether poor or rich, have lower fertility than their counterparts who are non-working. When compared by marriage cohort, working women show lower fertility than non-working women at the cohort of less than 12 years in both the rural and urban areas. But at other marriage cohorts, there is no difference in fertility of the working and the non-working women in both the areas.

The relation of occupation of husbands and the average fertility of their wives in Bangladesh does not conform to a pattern of class position. In the urban area, the wives of landless agricultural workers are the least fertile and the wives of the white-collar workers, the most fertile group. This pattern is also maintained at the marriage cohort of 14-15 years. In the rural area, the least and the most fertile groups are the wives of the unclassified labourers and the wives of the agricultural (own land) workers respectively. They are also the least and the most fertile groups at the marriage cohort of less than 12 years.

Rich women tend to have borne more children than poor women in both the rural and urban areas when either age or duration of marriage is controlled. The differentials also persist at different levels of education of wife. In the rural area, the uneducated rich women have slightly higher fertility than the uneducated poor women, but there is no difference in fertility of rich and poor women who have primary education. In the urban area, rich women have considerably higher fertility than poor women at no education and primary education. Rich women also tend to show higher fertility than poor women by marriage cohorts except the cohort of 16 years and over.

The pattern of the relationship between age at marriage and fertility indicates that as age at marriage increases from 12 years, the mean parity of the urban ever married women decreases by a small amount, but the mean parity of the rural ever married women remains the same. The mean parity of women married at ages below 12 years is considerably lower than that of women married at age 12 and more than 12 years. This holds true for all the ever married women by rural-urban place of residence and for all the socio-economic groups in each area. The differential effect of duration of marriage is controlled here throughout.

The fertility of the women by marital status reveals that widows have had the highest parity, and the divorced and separated women, the lowest parity in both the rural and urban areas. The parity of widows remains higher than that of any other groups in the rural area and becomes equal to the parity of currently married women in the urban area even after controlling for duration of marriage. However, the currently married women become the highest parity group, divorced and separated women, the lowest parity group and the widows take the intermediate position when standardised for age. This pattern holds for both the rural and urban women.

The path analysis has enabled to incorporate a large number of variables into the postulated models at one time and scrutinise the variables whose effects are statistically significant while controlling for others. Of the seven variables hypothesised to affect fertility directly in the urban area, a positive and statistically significant effect is found to be exerted by each of the four variables: "Religion", "Education of Husband", "Age at Marriage", and "Duration of Marriage of Wife". The only variable which shows a negative and statistically significant direct effect on fertility is "Education of Wife". The remaining two variables: "Childhood Place of Wife", and "Childhood Place of Husband", do not show a statistically significant effect on fertility in the urban area.

The above seven variables were also hypothesised to affect fertility directly in the rural area. But only three variables: "Religion", "Age at Marriage" and "Duration of Marriage of Wife" show a statistically significant direct effect. The direct effect of each of these variables is positive.

In Bangladesh as a whole, the variables directly affecting fertility are: "Education of Wife", "Religion", "Age at Marriage of Wife", and "Duration of Marriage". Of these, the first variable has a negative direct effect, while each of the last three variables has a positive direct effect on fertility.

One striking point that emerges from each of the three models is that the direct effect of age at marriage on fertility is positive. This occurs when all other variables in a model are controlled simultaneously, reinforcing the fact that there is a

"catch up" phenomenon among women who marry late. Despite its positive direct effect, the total effect of age at marriage on fertility is negative.

The path analysis models are temporal and subjective. They are meant not for policy formulations, but for disentangling a complex set of relationships that are at work in the population. The inclusion of other relevant variables that affect fertility directly or indirectly is inevitable to focus a broader spectrum.

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APPENDIX A

Data Subset Prepared for this Thesis from the Data of the Bangladesh Fertility Survey (BFS), 1976

BFS Section	BFS Card type	Variable number	Information	Column No. BFS	Column No. Subset	Field for subset	Cumulative field for subset
1	11	1	Rural-urban identification	5-8	1-4	04	04
		2	Childhood place of residence of wife	15	5	01	05
		3	Age (month, year)	M 16-17 Y 18-19	6-7	02	07
		4	Ever attended school	22	8	01	08
		5	Highest level of school attended	23	9	01	09
		6	Highest class passed	24-25	10-11	02	11
		7	Can read a newspaper, book or letter	26	12	01	12
		8	Religion	27	13	01	13
2	21	9	Marital status	9	14	01	14
		10	Married once or more than once (widowed, divorced, separated)	10	15	01	15
		11	Age at present marriage (currently married)	11-14	16-17	02	17
		12	Consummation of marriage (for currently married)	15	18	01	18
		13	Married once or more than once (for currently married)	24	19	01	19
		14	No. of times married altogether (for ever married women)	25	20	01	20
		15	Date (year) of former first marriage	26-29	21-22	02	22
		16	Outcome of former first marriage	30	23	01	23
		17	Year of termination of former first marriage	31-34	24-25	02	25
		18	Year of second marriage	35-38	26-27	02	27
		19	Outcome of second marriage	39	28	01	28
		20	Year of termination of second marriage	40-43	29-30	02	30
		21	Year of third marriage	44-47	31-32	02	32
		22	Outcome of third marriage	48	33	01	33
		23	Year of termination of third marriage	49-52	34-35	02	35
		24	Year of fourth marriage	53-56	36-37	02	37
		25	Outcome of fourth marriage	57	38	01	38
		26	Year of termination of four marriage	58-61	39-40	02	40

3	32	27	Total male live birth living	11-12	41	01	41
		28	Total female live birth living	13-14	42	01	42
		29	Total live births	M 15-16 F 17-18	43-44	02	44
6	61	30	Present working status of wife	9	45	01	45
		31	Type of occupation (after marriage)	13-14	46-47	02	47
		32	Type of occupation (before marriage)	29-30	48-49	02	49
7	71	33	Age of current (last) husband	M 11-12 Y 13-14	50-51	02	51
		34	Husband ever attended school	15	52	01	52
		35	Highest class attended by husband	16	53	01	53
		36	Highest class passed by husband	17-18	54-55	02	55
		37	Husband can read a newspaper, a book or a letter	19	56	01	56
		38	Childhood place of residence of husband	20	57	01	57
		39	Occupation of husband	21-23	58-60	03	60
9	91	40	Own house or not	15	61	01	61
		41	Owns any other house or not	16	62	01	62
		42	Owns: Radio	17	63	01	63
		43	Boat	18	64	01	64
		44	Tea set	19	65	01	65
		45	Car	20	66	01	66
		46	Iron	21	67	01	67
		47	TV set	22	68	01	68
		48	Bicycle	23	69	01	69
		49	Refrigerator	24	70	01	70
		50	Watch-clock	25	71	01	71
		51	Motor bicycle	26	72	01	72
		52	Sewing machine	27	73	01	73
		53	Bedstead	28	74	01	74
		54	Number of days ate rice last week	29	75	01	75
		55	Number of days ate meat or fish last week	30	76	01	76
		56	Number of meals had yesterday	31	77	01	77

APPENDIX B

STANDARD POPULATION

The standard population is the weighted national sample of ever married women (respondents) aged 10-49. The weights were for urban = 0.347 and for rural = 1.194. The detailed procedure of estimating these weights are given in the provisional report of the BFS (Bangladesh, n.d.).

TABLE B.1

The Distribution of the Standard Population by Age: BFS, 1976

Age Group	Percentage of Women
10-19	21.1
20-29	38.0
30-39	22.8
40-49	18.1
TOTAL	100.0 (6514)

TABLE B.2

The Distribution of the Standard Population by Duration of Marriage: BFS, 1976

Duration of Marriage	Percentage of Women
0-9	34.9
10-19	32.8
20 or more	32.3
TOTAL	100.0 (6515)

APPENDIX B (Contd.)

TABLE B.3

The Distribution of the Standard Population by Duration of Marriage Cross-Classified by Age at Marriage: BFS, 1976

Duration of marriage	Age at marriage			
	< 12	12-13	14-15	16+
< 10	15.7	34.2	48.5	59.9
10-19	33.7	37.3	30.4	21.0
20 or more	50.6	28.5	21.1	19.1
TOTAL	100.0	100.0	100.0	100.0
	(1949)	(2321)	(1489)	(756)

Estimation of duration of marriage

The term "duration of marriage" refers to years since first marriage by taking into consideration the marital dissolution, remarriage, that had happened since that initial event. The marriage history section of the BFS questionnaire provides detailed information on current and all previous marriages of each respondent. The maximum number of marriages of a woman for which information was collected is four. The procedure of estimating marital duration is as follows. To estimate the duration of marriage, the ever married women (respondents) are classified into three groups:

(i) currently married and only once married;

(ii) currently married and more than once married. (In other words, the current marriage may be the second, third, or fourth marriage);

(iii) not currently married (in other words, widowed, divorced, and separated).

APPENDIX B (contd.)

Let M = total duration of marriage

M_1 = duration of first marriage

M_2 = duration of second marriage

M_3 = duration of third marriage

and M_4 = duration of fourth marriage

Again let A = current age of a woman at the time of the survey

B = age at marriage of the currently married women who are either once married or more than once married

C = year of first marriage

D = year of termination of first marriage

E = year of second marriage

F = year of termination of second marriage

G = year of third marriage

H = year of termination of third marriage

I = year of fourth marriage

J = year of termination of fourth marriage

The symbols C to J are applicable only for groups (ii) and (iii).

Group (i): For currently married and only once married women, the total duration of marriage is given by -

$$M = M_1 = A-B$$

Group (ii): For this group, the current marriage is the last marriage at the time of the survey and there may be a maximum of three former marriages. Therefore,

$$M_1 = D-C$$

$$M_2 = F-E$$

$$M_3 = H-G$$

and $M_4 = A-B$, because B here refers to age at last marriage

$$\therefore M = M_1 + M_2 + M_3 + M_4$$

Group (iii): For this group there may be a maximum of four previous marriages. Hence:

$$M_1 = D-C, \quad M_2 = F-E, \quad M_3 = H-G, \quad M_4 = J-I$$

and $$M = M_1 + M_2 + M_3 + M_4$$

APPENDIX C

TABLE C.1

Hypothesised Path Coefficients[a], Urban Model

Effect	Cause 1	2	3	4	5	6	7	8
REL 1	..							
CPW 2	..	..						
CPH 3	..	...	..					
EDW 4	-054	280	..	..				
EDH 5	-053	..	136	..				
AMW 6	-118	098	..	243	132	..		
DMW 7	-087	-012	-003	-214	129	-347	..	
CEB 8	040	-019	025	-079	059	133	785	..

TABLE C.2

Hypothesised Path Coeffieients[a], Rural Model

Effect	Cause 1	2	3	4	5	6	7	8
REL 1	..							
CPW 2	..	..						
CPH 3	..	..	..					
EDW 4	-040	165	..	..				
EDH 5	-095	..	139	..	..			
AMW 6	-041	015	..	165	048	..		
DMW 7	-042	009	010	-144	021	-345	..	
CEB 8	034	017	002	-020	014	156	829	..

TABLE C.3

Hypothesised Path Coefficients[a], National Model

Effect	Cause 1	2	3	4	5	6	7
REL 1	..						
RES 2	..	..					
EDW 3	-036	202	..				
EDH 4	-093	160	..	..			
AMW 5	-045	052	188	058	..		
DMW 6	-044	024	-142	029	-347	..	
CEB 7	034	007	-023	014	154	825	..

NOTE: [a] Decimal points have been omitted; all entries should be divided by 1000.

APPENDIX D

TABLE D.1

Correlation Matrix[a] For Urban Model

	1	2	3	4	5	6	7	8
REL 1	1000							
CPW 2	096	1000						
CPH 3	037	408	1000					
EDW 4	-027	274	137	1000				
EDH 5	-048	227	134	755	1000			
AMW 6	-121	183	124	372	343	1000		
DMW 7	-046	-115	-066	-248	-151	-375	1000	
CEB 8	-014	-079	-020	-182	-076	-176	745	1000

TABLE D.2

Correlation Matrix[a] For Rural Model

	1	2	3	4	5	6	7	8
REL 1	1000							
CPW 2	010	1000						
CPH 3	-027	145	1000					
EDW 4	-038	165	129	1000				
EDH 5	-099	108	142	604	1000			
AMW 6	-052	047	040	198	153	1000		
DMW 7	-021	-028	-017	-195	-112	-368	1000	
CEB 8	008	000	-005	-141	-068	-151	773	1000

NOTE: [a] Decimal points have been omitted; all entries should be divided by 1000.

APPENDIX D (Contd.)

TABLE D.3

Correlation Matrix[a] For National Model

	1	2	3	4	5	6	7
REL 1	1000						
RES 2	013	1000					
EDW 3	-033	201	1000				
EDH 4	-091	159	637	1000			
AMW 5	-056	099	237	190	1000		
DMW 6	-023	-034	-199	-119	-370	1000	
CEB 7	007	-009	-142	-072	-155	770	1000

NOTE: [a] Decimal points have been omitted; all entries should be divided by 1000.

TABLE D.4

Means and Standard Deviations of the Variables

Variable	Urban[a]		Rural[b]		National[c]	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
REL	0.85	0.36	0.83	0.38	0.83	0.37
CPW) RES[d]	0.33	0.47	0.02	0.13	0.08	0.27
CPH)	0.27	0.45	0.01	0.11		
EDW	2.47	3.63	0.86	1.91	0.98	2.14
EDH	4.65	4.87	2.43	3.57	2.61	3.74
AMW	13.47	3.62	12.32	3.10	12.41	3.16
DMW	13.92	9.71	15.14	10.16	15.02	10.13
CEB	3.88	3.04	3.96	3.10	3.95	3.09

NOTE: a = Number of cases = 1403
b = Number of cases = 4867
c = Number of cases = 6363
$\bar{X}$ = Mean
S.D.= Standard deviation
d = Place of residence in the national sample