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Factors Affecting Fertility in Pakistan

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1. INTRODUCTION

Pakistan, with an estimated population of 122 million in 1993, is the eighth most populous country in the world. The historical trends indicate a continuous and exponentially increasing growth in population because of sustained high fertility and declining mortality. Currently, the population is growing at around 3 percent per annum, one of the highest rates of growth in the world. In Pakistan, the contraceptive prevalence is very low (14 percent) and the fertility level is among the highest in the world. There has been only a marginal decline in fertility in Pakistan over the last two decades. An average married woman in Pakistan still experiences a total of at least seven children if she survives and completes her reproductive period.

Using data from the Pakistan Contraceptive Prevalence Survey 1984-85 [see Population Welfare Division, (1986) for details], the purpose of this analysis is to determine whether there are any differentials in fertility levels by age at marriage, educational level, work status, region of residence (province), and place of residence (urban or rural). Both bivariate and multivariate analyses have been undertaken to examine the effects of these demographic and socio-economic factors on the level of fertility.

2. METHOD OF ANALYSIS

In Pakistan, fertility is affected by a number of interrelated factors. The examination of the bivariate relationships between selected demographic and socio-economic variables with fertility is important. However, the reproductive

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behaviour in human populations is the result of a complex web of socio-economic, biological and behavioural factors in which the factors themselves are intricately related to one another. Thus, to identify the effect of any particular factor on fertility, it is necessary to control for others. Although the traditional approach is through cross-classification of the data, such analysis can handle only two or three variables at a time. Intricate interactive links between the independent variables and a dependent variable in the study of human behaviour, such as fertility, thus necessitate application of multivariate analysis techniques. Therefore, besides bivariate analysis, the net effect of each predictor variable on the dependent variable after controlling for the effect of other predictors and covariate has also been measured through multivariate analysis.

Given the type of data in the survey, the technique of Multiple Classification Analysis (MCA), which is analogous to multiple regression analysis with 'dummy variables', has been selected here to determine the net effect of each factor. Multiple Classification Analysis is a multivariate technique for examining the interrelationships between several predictor variables and a dependent variable within the context of an additive model. This technique has some distinct advantages as it can be used when the dependent variable is interval-scaled or even if it is a dichotomous variable which is not greatly skewed. Some other multivariate techniques can also be used with either interval-scaled or dichotomous dependent variables, but the major advantage of MCA over other multivariate techniques is that it can incorporate predictor variables which are interval, ordinal or nominal-scaled. MCA deals not only with linear but also non-linear relationships among predictors and the dependent variables. [Andrews *et al.* (1973): 1–8]. The MCA model assumes that the dependent variable is predicted by the additive effect of the predictors and can be expressed by the following equation:

$$y_{ij\ldots n} = \bar{y} + a_i + b_j + \ldots\ldots + e_{ij\ldots n}$$

where:

- $y_{ij\ldots n}$ is the score of individual n who falls in the i-th category of predictor A, the j-th category of predictor B. etc.;
- $\bar{y}$ is grand mean on the dependent variable;
- a_i is the effect of memberships in the i-th category of predictor A;
- b_j is the effect of membership in the j-th category of predictor B; and
- $e_{ij\ldots n}$ is an error term.

Various statistics are computed through the MCA programme. The mean value for each category is calculated with deviations of each category from the grand mean before and after adjusting for other predictors and covariates. The eta statistic is the correlation ratio and indicates the proportion of total sum of squares explained by the predictor. The beta or partial correlation ratio is the coefficient obtained after controlling for the effect firstly of the predictors, and then of predictors plus covariates. The multiple *R* provides a summary estimate of the overall relationship between predictors and the dependent variable, adjusted for the degree of freedom. The multiple *R* when squared measures the total variation in the dependent variable explained by all the predictors and covariates taken together, adjusted for degree of freedom.

3. RESULTS AND DISCUSSION

The detailed bivariate analysis has been carried out to see differentials in fertility by demographic and socio-economic variables (Tables 1–3) Table 4 contains the results of the Multiple Classification Analysis (MCA) and show the effect of predictor variables on children ever born. Selection of predictors and covariate is mainly on the basis of differentials observed in the bivariate analysis and other requirements of the analysis, such as significance levels and interactions.

The findings from the multiple *R*-squared value indicate that the variation explained by all the independent variables was low (Table 4). Only eight percent of the variance was explained by the seven predictors (age at marriage, education of husbands and women, work status of women, occupation of husbands, region and place of residence). The *R*-squared value increased substantially with the additive effect of all the predictors and the covariate age, when it explained 55 percent of the variance. Among the predictors, the beta values indicate that age at marriage is the most significant variable followed by husbands' education, women's education, husbands' occupation, women's work status, region and place of residence. It is evident that, of the demographic variables, age and age at marriage are the most important determinants of fertility in Pakistan. Among the socio-economic variables, the educational level of both husband and wife are significant and important determinants of cumulative fertility in Pakistan. The individual effect of predictors, as gross effect, and adjusted effect after controlling for the effects of other predictors and covariate upon the dependent variable, children ever born, varies. The findings of both bivariate and multivariate analysis are discussed in the preceding paragraphs.

Table 1

Mean Number of Children Ever Born to Currently Married Women Aged 15–49 by Demographic and Socio-economic Variables (DSEV), Pakistan 1984–85

DSEV	Current Age of Women								
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	15–49	Std*
Age at Marriage									
< 15	0.91	2.72	4.41	6.18	6.80	7.74	8.30	5.06	5.10
16–19	0.39	1.63	3.55	5.16	6.51	7.22	7.59	4.14	4.67
20–24		0.66	1.95	3.89	5.19	6.34	6.87	3.58	3.25
25 +			0.69	1.85	3.17	4.29	4.99	2.82	1.46
Education of Women									
No Education	0.66	1.81	3.45	5.17	6.27	7.14	7.61	4.45	4.39
Primary	0.51	1.73	3.22	4.44	5.79	6.02	7.03	3.58	3.93
Secondary	0.42	1.63	3.10	3.65	4.99	5.76	6.03	3.23	3.61
Tertiary	0.0	1.60	1.79	3.19	3.06	3.38	5.31	2.34	2.57
Husband's Education Level									
No Education	0.71	1.78	3.51	5.25	6.34	7.22	7.67	4.66	4.48
Primary	0.64	1.82	3.53	5.22	6.43	7.51	8.11	4.41	4.47
Secondary	0.53	1.81	3.21	4.58	5.79	6.26	6.98	3.71	3.97
Tertiary	0.56	1.72	2.88	3.90	4.69	5.50	5.28	3.21	3.49
Work Status of Women									
Salaried Employed	1.61	2.16	3.08	4.28	5.47	7.74	7.87	5.03	4.41
Self-employed	0.71	1.97	3.38	5.23	6.16	7.28	7.80	4.69	4.47
Work at Home	0.61	1.74	3.36	4.95	6.14	6.91	7.44	4.17	4.23

Continued –

Table 1 – (*Continued*)

Occupation of Husbands									
Salaried Employed	0.66	1.69	3.21	4.90	5.85	6.87	6.66	3.90	4.09
Self-employed	0.74	1.69	3.45	4.99	6.32	7.43	8.18	4.41	4.41
Agriculture	0.59	2.03	3.44	5.08	6.22	6.82	7.42	4.50	4.35
Unemployed	0.44	1.14	3.23	4.86	5.90	7.04	7.63	4.33	4.17
Region of Residence									
Punjab	0.61	1.73	3.35	4.77	6.14	7.09	7.41	4.26	4.24
Sindh	0.69	1.99	3.41	5.09	5.99	7.20	7.79	4.34	4.34
NWFP	0.67	1.77	3.38	5.47	6.13	6.30	7.32	4.17	4.24
Balochistan	0.44	1.66	3.28	5.61	6.71	7.48	8.69	4.72	4.61
Place of Residence									
Urban	0.69	1.80	3.25	4.80	6.10	7.20	7.69	4.40	4.28
Rural	0.62	1.78	3.41	5.07	6.15	6.93	7.46	4.23	4.28
Total	0.63	1.79	3.36	4.99	6.13	7.01	7.53	4.28	
Number of Women	**569**	**1420**	**1675**	**1154**	**1155**	**863**	**569**	**7405**	

Source: Pakistan Contraceptive Prevalence Survey 1984–85, original analysis of data.

Note: Std* = Standardised using the age distribution of all women.

Table 2

Mean Number of Children Ever Born to Currently Married Women by Education of Women and their Husbands, and Women's Work Status, Pakistan 1984-85

Education of Husband/ Women's Work Status	Education of Women				
	No Education	Primary	Secondary	Tertiary	Total
Education of Husband					
No Education	4.69	3.66	4.55	2.36	4.66
Primary	4.43	4.39	3.14	4.31	4.41
Secondary	3.90	3.33	3.17	2.48	3.71
Tertiary	3.68	3.43	3.08	2.27	3.21
Work Status of Women					
Salaried Employed	6.03	1.31	2.88	3.21	5.03
Self-employed	4.76	3.31	4.16	2.83	4.69
Work at Home	4.35	3.63	3.19	2.21	4.17
Total	4.45	3.59	3.23	2.34	4.28
Number of Women	6243	607	436	102	7388

Source: Pakistan Contraceptive Prevalence Survey 1984-85, original analysis of data.

Table 3

Mean Number of Children Ever Born to Currently Married Women Aged 15–49 by Place and Region of Residence, Pakistan 1984-85

Place of Residence	Region of Residence				
	Punjab	Sindh	NWFP	Balochistan	Total
Urban	4.23	4.65	4.62	4.50	4.40
Rural	4.27	4.09	4.10	4.76	4.23
Total	4.26	4.34	4.17	4.72	4.28
Number of Women	4430	1543	1118	314	7405

Source: Pakistan Contraceptive Prevalence Survey 1984-85, original analysis of data.

Table 4

Unadjusted and Adjusted Mean Number of Children Ever Born to Currently Married Women Aged 15–49, Pakistan 1984-85

	Unadjusted ETA	Adjusted for Predictors BETA	Adjusted for Predictors/ Covariates ETA	Number
Age at Marriage	.20	.19	.28	
< 15	5.05	5.04	5.15	2365
16–19	4.15	4.11	4.34	3241
20–24	3.58	3.66	3.24	1414
25 +	2.84	2.92	1.50	277
Husband's Education	.16	.09	.03	
No Education	4.66	4.52	4.31	3772
Primary	4.40	4.31	4.39	1180
Secondary	3.72	3.88	4.17	1820
Higher	3.21	3.86	4.11	525
Women's Education	.14	.10	.04	
No Education	4.45	4.40	4.33	6158
Primary	3.58	3.87	4.14	603
Secondary	3.24	3.52	4.00	435
Higher	2.35	2.82	3.59	102
Husband's Occupation	.08	.05	.03	
Salaried Employed	3.91	4.07	4.27	2283
Self-employed	4.40	4.34	4.42	2190
Agriculture	4.51	4.41	4.20	2510
Unemployed	4.30	4.37	3.99	314
Women's Work Status	.07	.06	.02	
Employed	5.04	5.36	4.69	118
Self-employed	4.68	4.00	4.36	1325
Work at Home	4.18	4.20	4.25	5854
Region of Residence	.03	.06	.04	
Punjab	4.25	4.34	4.34	4384
Sindh	4.35	4.18	4.21	1510
NWFP	4.17	4.02	4.01	1094
Balochistan	4.69	4.91	4.80	309
Place of Residence	.03	.12	.04	
Urban	4.40	4.86	4.46	2100
Rural	4.23	4.05	4.21	5197
Multi *R*-squared (%)		8.0	55.0	
Grand Mean	4.28			

Source: Pakistan Contraceptive Prevalence Survey 1984-85, original analysis of data.

Note: Covariate used is age of women. P(F) ratio of all predictors significant at < .001 level.

Age at Marriage and Fertility

In Pakistan, where contraception is not widely used, the length of reproductive period becomes the major determinant of the level of fertility. Age at marriage not only marks the entry into a sexual union and the beginning of exposure to child bearing but may also be an important gauge of women's status, since the older the woman is when she marries, the greater the likelihood that she has attended school or been employed, and the greater her chances of having a more equal relationship with her husband [Kazi and Sathar (1986): 602]. If age at marriage is early, a woman will have a longer exposure period and is expected to end up with higher fertility, while late marriage has been found to have a fertility reducing effect [Coale (1975)].

Some authors have argued, however, that an increase in the age at marriage is not necessarily associated with lower fertility. A rise in age at marriage from under 15 years to 16–18 years would produce an increase in fertility during the early years of marriage, and it may also raise fertility in the later years of married life insofar as postponement of marriage is favourable to the health of women and may exert its effect throughout the reproductive period. But the postponement of marriage beyond 19 years of age would probably produce and appreciable decline in fertility because women who marry at these ages will lose an appreciable amount of their fertile period and are not likely to compensate for the loss [Agarwala (1967)]. In Pakistani society, all Muslims, male and female, are supposed to marry and fulfil their sexual and procreative needs within marriage. Divorce, though allowed by religious prescription, is rare. Remarriage of widows and divorcees is also encouraged in Islam. A decline in fertility due to a rise in age at marriage has been documented in various studies in Pakistan [Alam and Karim (1986)]. In Pakistan the legal age at marriage for females is 16 years, yet many girls are married off below age 16. This is due to the religious and cultural beliefs of parents who often feel somewhat relieved after the marriage of their daughters.

It is evident from the findings of this study that age at marriage is inversely related to fertility in Pakistan (Table 1). The mean number of children ever born to women of all age groups whose age at marriage was less than 16 years was much higher than to those who married at 16 years or over. For example, the mean number of children ever born was 5.1 for those who married below age 16, whereas it was 4.1 for age at marriage 16–19, 3.6 for age at marriage 20–24 and 2.8 for those marrying at 25 years or above. Similarly, the average parity of women aged 45–49 years was 8.3 children for those who married under 16 years, compared to 7.6 children for those who married at ages 16–19 years, 6.9 children for those who married at ages 20–24 years and 5.0 children for those who married at age 25 years

or above. A clear and consistent pattern indicating lower fertility with rising age at marriage is visible. This pattern also persists when controls for current age of women are introduced.

In the multivariate analysis, the effect of age at marriage as a predictor is the strongest. Its effect as eta and beta values remains significant. Similarly differentials in mean number of children ever born also remain wide between younger and older groups of age at marriage. The contribution of other predictors could not diminish its effect and the findings of the bivariate analysis are upheld in this case (Table 4).

Education and Fertility

There are numerous channels through which education can affect fertility. It is contended that education provides individuals with a new vision and normative orientation, better health care, better employment opportunities outside home, better knowledge of and access to family planning methods; these in turn, may produce a depressing effect on fertility [Cochrane (1979)]. Educational attainment alters parents' perceptions of the advantages of small families, brings changes in the status of women, changes the social and economic aspirations, and affects both attitude towards contraception and ability to understand and make use of particular methods [Cassen (1976): 90]. The empirical findings of a number of studies have supported such an inverse relationship between education and fertility [United Nations (1983): 56–86].

The relationship between education and fertility, however, has not always been found to be an inverse one. In poor countries with relatively low levels of education and in the early phases of economic development, education may at first serve to raise fertility because of the association of education with improved health, lower levels of infertility, and shorter durations of breastfeeding [Ware (1981): 79]. Nevertheless, in the long run fertility declines with educational attainment because of the changes brought about by education, particularly attitudes towards family size. In fact, education is so intricately associated with many social, economic and psychological processes that the true nature of its relationship with fertility remains obscure [United Nations (1983): 84]. Education certainly affects age at marriage, and also affects other explanatory variables such as the attitude to ideal family size, and costs and benefits of children [Holsinger and Kasarda (1976): 154]. [Cochrane (1979): 6–9] has shown that the aggregate level of education in the community affects the level of fertility, and she also concluded that an inverse relation is much more consistent for female than male education.

[Caldwell (1980): 227–49] considered that the greatest impact of education is not direct but through the restructuring of family relationships and family economies and the effect of these on the direction of net wealth flows between generations. He believes that, fundamentally, schooling attacks the traditional family economic structure by weakening the authority of the old over the young and of the male over the female. Elaborating on this theme, Caldwell (1982) maintained that intergenerational cost and benefit shifts occur when parents begin to invest more in the education of their children than children contribute to the family through child labour and care for aged parents. This reversal in the intergenerational flow of wealth from that of children to parents to that of parents to children encourages couples to opt for smaller families. This theory of Caldwell's fits in many situations. If parents provide their children with higher education. it will lead to higher direct as well as indirect costs of having children.

The analysis of data for Pakistan shows a negative effect of education on fertility (Table 1). Women with no education have a higher mean number of children ever born compared to those with some education. The mean number of children ever born to women with no education is 4.5, with primary education 3.6, with secondary education 3.2 and with tertiary education 2.3. In all age groups, an increase in the level of education is associated with a decline in the number of children ever born. Even the age standardised mean number of children ever born reveals that fertility is lower for those women who have attained a higher level of education, compared to those who have less education or no education. Differentials are also clearly visible in the average parities for women in the age group 45–49 years, indicating 7.6 children ever born for those having no education, 7.0 with primary education, 6.0 with secondary and 5.3 with tertiary education.

As compared to female education, male education does not indicate a strong inverse association with fertility (Table 1). No clear-cut differentials in fertility are noticeable between women whose husbands have no education and those having primary education. There is an indication of a weak but inverse relationship between husband's education and fertility, which is pronounced only with secondary level of education or higher. The average parity for women whose husbands have no education is 4.7 children; this remains at 4.4 children when husbands have primary education and only drops to 3.7 children when husbands have secondary education and to 3.2 children if husbands have tertiary education.

The effect of wife's education, while controlling for husband's education, remains more visible compared to the effect of husband's education (Table 2). When both wife and husband are educated, the inverse effect on fertility is more

pronounced. With an increasing level of education for both partners, fertility declines considerably. For example, if both husband and wife have no education, the mean number of children ever born is 4.7. However, if both have a tertiary level of education, the mean number of children ever born is 2.3 indicating a 49 percent decline.

In the multivariate analysis, as regards women's education, differentials noted in cross-classification analysis, remain large even when adjusted for other predictors. The effect of the covariate age reduces these differentials to some extent, but they still remain highly visible (Table 4). However, in regard to husband education, differentials noted in bivariate analysis remain visible when adjusted for other predictors but its effect is almost negligible when adjusted for covariate age. This indicates the importance of education of women in Pakistani society for any change in reproductive behaviour. The education of men can be expected to affect fertility differently from the way fertility is affected by the education of women because of their different roles in the reproductive process and the different effect of education on their lives.

Work Status of Women and Fertility

Although a negative association between female work and fertility has been found in several developed countries, the relationship has not always been clear and inverse in the case of developing countries [Shah (1986): 264]. In Pakistan, a few studies have examined the relationship between work participation of women and fertility. The findings of these studies indicate that women's work has not been found to have a consistent negative influence on fertility [Shah (1975); Syed (1978)]. Women's labour force participation in Pakistan is not necessarily associated with enhanced status [Sathar *et al.* (1988): 417]. However, women who work outside the home and particularly those who earn cash incomes are presumed to have enhanced control over household decisions, increased awareness of the world outside the home and subsequently more control over reproductive decisions.

For a wife to work after marriage in Pakistan, she needs her husband's approval. It is thus conceivable that obtaining such permission depends upon several things, such as how conservative her husband is, what type of work she can perform, and how other persons (such as kin and neighbours) will react to her working outside the household. Moreover, employment opportunities outside the home are very limited for women. In the context of the position of women in the Pakistani society, where sex segregation and domination of males over females are common and women's work outside the home generally is not highly valued, it is

usually assumed that working women, as a privileged group, would have lower fertility than their non-working counterparts. However, in this study it has been found that women working as salaried employees have rather higher fertility than those who are either working for the family business or perform home duties. Those women who work at home had the lowest average parity, 4.2, compared to salaried employees, 5.0 (Table 1). The findings are not consistent in different age groups. For the salaried employees, fertility was higher for younger women aged 15–24 and for older women aged 40–49. In the age group 25–39, salaried employees had lower fertility than other women engaged in family business or performing home duties. However, when adjusted for age, differentials in various categories of women's work status are not sustained.

When a control for women's education was introduced, it was found that working women who had achieved some education had lower fertility compared to those who were employed but had not attained any education (Table 2). Even the fertility of employed women with some education was lower than for their non-working counterparts. It is evident that even for employed women, education is an important factor for any change in reproductive behaviour. In Pakistan uneducated women who are working outside their homes as salaried employees are presumably forced to take up paid employment as a necessity and their contribution to the household income is probably essential for their survival [Kazi and Sathar (1986): 605].

It is noted that in the multivariate analysis, the differentials observed in the cross classification analysis, though lessened to some extent, remained when adjusted for other predictors or the covariate age (Table 4). It seems that the category of working women in itself does not represent an effective determinant of fertility decline. Other factors, such as extended duration of breastfeeding, may be at work. Moreover, in Pakistan, employment of women outside the home is not encouraged by the family and society. It is also likely that working women do not enjoy more freedom than their non-working counterparts in the decision-making processes of the family because of their subordinate position to the patriarch.

Husband's Occupation and Fertility

Husband's occupation is a measure of social status in the community as well as the economic circumstances of the family. The occupation of the husband has been widely used as an index of socio-economic status in the study of fertility differentials. Classically, changes in the occupational distribution of the population of industrially advanced countries have accompanied a general decline in fertility.

Relatively high fertility has been found to be associated with occupation in the primary industries, particularly agriculture and mining, while lower fertility has been associated with the professional classes, white collar workers, and urban industrial workers [United Nations (1973): 100]. Information on the relationship between occupational status and fertility is very limited for high fertility countries. A review of the literature on males' occupation and fertility in many developing countries does not give a clear picture. The evidence suggests that other factors are more important than employment.

In Pakistan, a male-dominated patriarchal Muslim society, male occupation is highly associated with the socio-economic status of the family. In particular, a woman's socio-economic status is determined by the occupation of her husband. Alam and Casterline (1984) found that husband's occupation in the modern sector was negatively related to fertility in Pakistan. [Ahmad (1984): 201-202] also confirmed that more men in professional and clerical groups in Pakistan use contraceptive methods than in other groups.

In this analysis, fertility differs to some extent by husband's occupation in Pakistan (Table 1). Women whose husbands work as salaried employees have comparatively lower fertility than those whose husbands are working in their own business or engaged in agriculture-related work. This difference is more visible in the age groups 25–29 years and over. There is a small number of women whose husbands are unemployed and these women have lower fertility compared to those women whose husbands are engaged in some sort of work. However, the lowest fertility of this subgroup is only in the younger age groups up to age 24 years, which is a significant factor. Presumably, because of economic pressure or delayed marriages, the fertility of this group is lower.

The multivariate analysis shows that the differentials observed for husbands' occupational categories in the bivariate analysis for children ever born did not remain visible when adjusted for other predictors or the covariate age (Table 4).

Region of Residence and Fertility

Although Pakistani society is religiously homogeneous, with the majority of the population followers of Islam, one of the features of Pakistani society is the existence of a wide racial, linguistic, and cultural diversity in the population. Of all the defining features of 'ethnic groups', language and dialect are probably the most important. The present provincial divisions broadly identify these groups as Balochis, Pathans, Sindhis and Punjabis living in the four provinces of Pakistan, that is, Balochistan, North West Frontier Province (NWFP), Sindh and Punjab

respectively. Pakistan's four provinces show considerable regional variation in population characteristics. Variations in fertility decline from 1960–1975 between the provinces have also been observed [Alam and Shah (1986): 53–86].

This study finds moderate variations in fertility among different geographical areas of Pakistan (Table 1). The mean number of children ever born is highest in Balochistan (4.72), followed by Sindh (4.34), Punjab (4.26) and NWFP (4.17). However, there does not exist any consistent pattern among different age groups. In Balochistan where the highest fertility level has been observed, the mean number of children ever born was lowest among the provinces for women below age 30, but highest for those over 30. This indicates that perhaps a slight trend of declining fertility has started in recent years in Balochistan. However, misreporting of births, or differences in marriage duration may be other factors accounting for the differential in fertility.

The pattern is almost the reverse in NWFP where fertility is higher in younger ages (15–29) and lower in older ages (30–49) compared to Balochistan. In Punjab where more than half of the total population of Pakistan lives, fertility is near to the national level in all age groups and there is a clear increase in fertility in successive age groups. In Sindh fertility is higher than the national level in all age groups and like Punjab shows a clear consistent increase with successive age groups. In Sindh province, there exist sharp language and cultural differences among the inhabitants of rural and urban areas. The local Sindhi speaking population mostly resides in rural areas, whereas the major urban cities (Karachi, Hyderabad and Sukkar) are predominantly inhabited by Urdu-speaking *Muhajars* (migrants from India after 1947). It is therefore appropriate to examine rural-urban fertility differentials in these populations as given in the subsequent section.

The region of residence does not give rise to a wide range of differentials in fertility. In unadjusted categories, the mean number of children ever born is slightly higher in Balochistan (4.69) followed by Sindh (4.35), Punjab (4.25) and NWFP (4.17). In the multivariate analysis, when adjusted for other predictors and the covariate, this pattern in fertility is slightly changed, that is, a further reduction of fertility in Sindh and NWFP if other factors are controlled for, but an increase in Punjab and Balochistan (Table 4). This suggests that fertility is higher in Balochistan, followed by Punjab, Sindh and NWFP. It is evident that the fertility level in Punjab, which is the largest populated province of Pakistan (55 percent), is slightly higher than the national average when adjusted for other predictors or the covariate age. This also negates the findings of some earlier studies suggesting that in Pakistan, Punjab had the lowest fertility in both the 1960s and 1970s, followed by Sindh and NWFP [United Nations (1987): 28].

Place of Residence and Fertility

The urban-rural differential in fertility is one of the most widely studied areas in fertility. It is generally expected that, in societies undergoing socio-economic, cultural, and demographic changes, fertility will be lower in urban than in rural areas due to the impact of a host of factors. The lower fertility in urban areas may be viewed from two perspectives. Firstly, at the aggregate (macro) level of analysis, urban fertility may be lower because the urban population has a larger proportion of couples who are well educated and have white collar jobs and who are thus likely to marry late and have smaller families. Secondly, at the individual (micro) level of analysis, one may hypothesise that the same level of education and income will produce lower fertility in urban than in rural areas due to the higher cost of raising the children in the urban setting. Moreover, the urban population contains a higher proportion of those who are expected to adopt new ideas and new life styles first, and of those for whom a large family does not represent an economic benefit but rather a burden.

The difference between urban and rural fertility in Western European countries widened during the fertility decline, but narrowed during the period of recovery following the Second World War. But in some Eastern European countries and the USSR, the difference appeared to have widened during the 1950s. Results from the developing countries, on the other hand, do not show consistent differentials by urban-rural place of residence [United Nations (1973): 97]. Urban fertility was found to be lower than rural fertility in Taiwan [Freedman *et al.* (1972)] and Thailand [Goldstein (1973)], while higher urban than rural fertility was observed in Indonesia [University of Indonesia (1974)] and Egypt [Omran (1973)]. Analysis of World Fertility Survey data by Rodriguez and Cleland (1981) revealed that in all Latin American and Caribbean countries, urban fertility was lower than rural fertility, but the divergence in the reproductive behaviour of urban and rural populations in Asia and the Pacific was less pronounced.

According to [Davis (1951): 70–71] in Pakistan and India as in other places, the cities manifested lower levels of fertility than the countryside. This difference approximates, but does not equal, that found in more European countries and American countries. However, in the 1961 census data of Pakistan, rural and urban fertility was virtually equal and [Robinson (1967): 109] observed no apparent relationship between urbanisation and marital fertility in Pakistan. [Hashmi (1965): 109] also argued that fertility in urban and rural areas did not exhibit any differentials, as he observed that in general the level of fertility in Karachi was by no means low. Karim (1974) also did not find any urban-rural fertility differentials in

Pakistan. According to Yusaf and Retherford (1981) both urban and rural fertility rates were in the neighbourhood of seven children, with a slightly higher fertility in urban areas. However, Casterline (1984); Sathar (1979) and Alam and Shah (1986) found that fertility was lower in urban areas of Pakistan. Whether this changing direction of the relationship between urbaisation and fertility is due to the difference in approaches or to a real trend needs to be examined.

In this study, place of residence does not reveal any significant difference in fertility (Table 1). The mean number of children ever born is marginally higher among urban women (4.4) compared to their rural counterparts (4.2). This pattern is, however, not uniform in all age groups, because in the age groups 25–29, 30–34 and 35–39 urban fertility is slightly lower than rural fertility. The overall marginal difference between rural and urban fertility does not exist when adjusted for the age of women.

Analysis of the regional variations in rural and urban fertility in 1984-85 yields interesting results (Table 3). In Punjab there is no appreciable difference between rural and urban fertility. Balochistan fertility is in the expected direction, that is, marginally higher mean number of children ever born in rural areas (4.8) compared to urban areas (4.5). In NWFP and Sindh, clear differentials in fertility between rural and urban areas have been observed. In both regions the results are identical; that is, mean number of children ever born is higher in urban areas (4.6) compared to rural areas (4.1).

In NWFP where only a small proportion (13 percent) of the population lives in urban areas, better health facilities and income may bring about higher fertility. It is also believed that many male members of families from rural areas of NWFP look for work away from their homes [Mohammad (1973); Irfan *et al.* (n.d.)] contributing to some extent to the possibility of temporary separation from their spouses. However, the results for Sindh are not in the expected direction. In Sindh the proportion of urban population (more than 40 percent) is higher than other provinces of Pakistan. This segment of the population, mostly inhabited by the Urdu speaking ethnic group of *Muhajars* (migrants), is considered more educated and is well covered by health and family planning facilities. This finding for Sindh differs from the findings of some researchers that fertility decline in certain urban areas of Pakistan, particularly in Karachi, has begun [Sathar and Akhtar (1998); Sathar and Kazi (1990)]. In fact there appears to be a competition between the two major ethnic groups (locals and migrants) in Sindh for an increase in their numbers.

Urban or rural place of residence has unexpected results in the case of fertility (CEB) in Pakistan compared with many other countries, with slightly higher

fertility for urban women than for rural women. This differential in fertility has also been upheld in the multivariate analysis after controlling for the effects of other predictors and the covariate age (Table 4). It appears that there is not much difference in fertility between rural and urban areas in Pakistan. A possible reason could be that the onset of fertility decline has not yet occurred in Pakistan, even in urban areas. In this case the findings in rural-urban fertility differences are not in the expected direction. It is possible that severe economic pressure associated with poor health and malnutrition is responsible, to a large extent, for the lower fertility of the rural women in Pakistan. On the other hand, urban women have higher fertility because they can still afford to rear children because of their better income and the lower economic cost of educating the children. Moreover, how far rural areas are away from the existing influence of urban areas is another important aspect. Due to electrification, swift means of transport and communication, contacts between rural and urban populations are more frequent.

Contrary to expectations, the urban way of life seems to be positively associated with the level of fertility in Pakistani society. Although the urban dwellers are engaged in occupations mostly other than agriculture and household work, and are better educated than rural residents, their influence as a group is to a great extent limited by the fact that they live in a society in which family interests continue to outweigh class identification and loyalty that probably cannot initiate a change in their reproductive behaviour. Even the position, role and power of urban women do not differ much from those of their rural counterparts. The basically unequal relationship between men and women remains constant in rural and urban areas. An urban woman has greater mobility but cannot challenge the superior social status of men. Hence urban centres in Pakistan differ from those of Western countries in their demographic response to urbanism.

Rural-urban migration has been a major contributing factor to the high growth rates of urban population in Pakistan. Most male migrants leave their families behind in the rural areas, and maintain close ties with the rural areas through occasional visits. Thus, though they are physically members of the urban population, they retain their rural values, norms and social interactions. Urbanism, therefore, probably failed to initiate a change in the old (traditional) values, norms and behaviour favourable to uncontrolled child bearing. Moreover, many of those who are in the urban areas enjoy better social amenities in health and education, have stable and higher incomes, and thus probably can afford large number of children. Another possibility could be that most women in Pakistan still regulate their fertility mainly through prolonged breastfeeding, rather than through volun-

tary control, and the duration of breastfeeding is shorter in urban compared to rural areas.

4. SUMMARY AND CONCLUSION

In this paper, bivariate and multivariate analyses were undertaken to see the effect of factors influencing fertility in Pakistan. It was found that age is the most important variable explaining variance in fertility, with older women having higher fertility. After age, age at marriage was found to be another important demographic variable, indicating lower fertility with rising age at marriage. In Pakistani society the significance of age in marital fertility is logical because of early and universal marriage and a very low use of contraception by married couples. Therefore, as expected, the demographic variables, age and age at marriage, are the most important determinants of fertility in Pakistan. The effect of age at marriage as a predictor is the strongest and the contribution of other socio-economic predictors did not diminish its effect.

The findings has also shown that an increase in education, particularly of women, can lead to a fertility decline. Women with no education have higher fertility, compared to those with some education. The inverse relationship between husband's education and fertility is only noticeable when husbands have at least a secondary level of education. Wide differentials noted in the bivariate analysis for woman's education remained even when adjusted for other predictors and age. Differentials noted in the bivariate analysis for husband's education remained after adjusting for other predictors, but decreased to an almost negligible level when adjusted for age.

Unlike many developing countries, in Pakistan it has been found that women working as employees have rather higher fertility than those who either work for the family business or only perform home duties. However, when the effect of women's education was controlled for, it was found that working women who had achieved some education had lower fertility compared to those who were also employed but had no education. Even for employed women, education is an important factor for any change in reproductive behaviour. The differentials for women's work status noted in the bivariate analysis, though narrowed to some extent, remained visible when adjusted for other predictors and age. However, differentials observed in the bivariate analysis for husbands' occupation level were not sustained when adjusted for other predictors and age.

Moderate variations in fertility were also found among the four provincial areas of Pakistan. In unadjusted categories, the mean CEB was slightly higher in

Balochistan, followed by Sindh, Punjab and NWFP. After adjustment for other factors in the multivariate analysis, this pattern in fertility was slightly changed, that is, the levels declined in Sindh and NWFP while they increased in Punjab and Balochistan. This suggests that the true level of fertility is highest is Balochistan followed by Punjab, Sindh and NWFP.

Fertility levels were observed to be marginally higher among urban women compared to their rural counterparts. Although these differentials are not sustained when adjusted for age of women, fertility is still equally high in urban areas. When controlled for region of residence, only in Balochistan (the smallest province in population size) fertility is higher in rural areas than in urban areas. In Punjab there is no appreciable difference between rural and urban fertility. However, both in Sindh and NWFP, fertility is higher among urban women compared to rural.

It appears from the analysis that the fertility transition has not yet started in Pakistan because fertility levels have been found to be equally high in both urban and rural areas and in all regions of Pakistan, except that decline is visible to some extent among educated women or those whose husbands are educated beyond primary level. This is possibly because cultural and societal factors are still very strong in favour of high fertility, thus constraining contraceptive use, and socio-economic development has not yet reached a stage where it is able to influence traditional fertility behaviour.

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Comments on "Factors Affecting Fertility in Pakistan"*

The question that what factors are critical in affecting fertility levels in Pakistan has special demographic significance and the author's attempt to address this issue needs appreciation. However, the analysis undertaken provides no specific understanding of the phenomenon and is merely focused on presenting the differentials in fertility by age and selected background characteristics of women, using data from Pakistan Contraceptive Prevalence Survey (PCPS) of 1984-85.

In general, I think the 60-paged paper is too large for its volume, with its 20 tables in the text, and 8 Appendix tables of unnecessary details given at the end, which are not only taxing the time of the reader but also the resources to reproduce them. Instead, it would have been useful to focus on a few tables relevant to the question addressed in the study. May be some of them could be collapsed into three way or even four way tables.

Second, the extensive literature review preceding the analysis incorporates discussion on all kinds of theoretical arguments and postulated relationships between selected socio-economic variables and fertility. I feel that the literature review needs to be updated and put in a framework relevant to the objectives of the study in a more precise manner.

As for my specific comments pertaining to the analysis of data, I find that the study is not more than a mere presentation of fertility differentials by a few socio-demographic variables such as age at marriage, education, work status and place of residence within a across-section. It is widely held that fertility is affected by a variety of demand and supply related factors including the use of contraception, yet the present analysis takes into account only a few conventional socio-demographic variables, completely missing out information on the supply side factors and contraceptive use.

The author has first presented a bivariate analysis, showing almost 12 tables on children ever born by age of women and selected explanatory variables. Each

*These comments are based on the paper presented in the 10th Annual General Meeting of the Pakistan Society of Development Economists.

table has a detailed description on fertility differentials by age which ultimately disappear when standardised for age. The results in Tables 5 and 6 on work status and fertility are ambiguous indicating that salaried employees with higher education have higher fertility than those engaged in 'family business' or 'work at home' and with lower educational levels. There is no explanation given for this contrary finding.

Similarly, the interpretation about husband's occupation in Table 7 is that the difference in fertility is more visible in the age-group of 25–29 and above. As we look at results in Table 7, we find no notable difference in children ever born by occupation among all age groups except for older women (40+), which again disappear when standardised for age.

Regarding regional variations in fertility, the author contends (Table 8) that the mean number of children ever born was lowest in Balochistan for younger age groups, and interprets it by saying that 'perhaps a trend of declining fertility has started in Balochistan' in recent years. When we look at the children ever born standardised for age, the reverse is true, indicating a slightly higher number in Balochistan than the other provinces (Table 8). I think the author needs to be careful in interpreting the results like that and discussing minor differences in children ever born by age if they disappear when standardised for the age of mother.

Another noteworthy point of discussion pertains to urban-rural differences in fertility. The results in Tables 9 and 10 indicate no substantial difference in urban and rural fertility, but the author keeps on emphasising the marginal differences in urban-rural fertility by age by given a detailed description of the table which seems redundant to me. It is very likely that fertility differentials by urban-rural residence and age have changed in recent years which has not been taken into consideration by the author. Instead, the paper includes a lengthy discussion on the likely factors or processes that can be attributed to a lack of decline in urban fertility which are speculative and have no evidence in the analysis.

The author then has undertaken a multivariate analysis, using MCA technique. Four regression models are run for four separate dependent variables–those are Children Ever Born (CEB), Desire for Additional Children, Ideal Number of Children and Desired Number of Children, using the same set of explanatory variables as included in the bivariate analysis.

The first question that comes up in this regard is the rationale of running separate models for four dependent variables which are highly correlated and reflect four sides of the same block. As seen from Table 12, the mean desired and ideal number of children do not differ much from each other. The author also

acknowledges that desired family size is a strong determinant of actual fertility and could be used as one of the predictor variables in the analysis. I think it would be more useful to present the results of only one dependent variable, and analyse them in a meaningful manner, may be in urban and rural areas separately to see if the chosen explanatory factors affect fertility differently in two types of areas.

The multivariate analysis results presented in Tables 13–16 indicate that the variation explained by the independent variables is as low as 8 percent in Model I of Children Ever Born and between 25 percent to 50 percent in the other three models. This clearly suggests that when there is little variation in fertility, the analysis of factors explaining fertility differentials is not of much value. What is more important is to address how and in what way changes in fertility can be accelerated; and what are the prospects of decline given the small variation and differentials found in fertility in all population strata.

Then comes a conflicting sentence in the concluding para of the paper that, 'fertility transition has not yet started in Pakistan', which again raises many questions. There is a recent evidence of decline in fertility in the PDHS of 1990-91 indicating that the urban and the educated subgroups of women are taking the lead in this regard.

In the end, I would like to say that the comments made for this paper are primarily meant to be suggestions rather than the critique of the paper. There is no doubt that the differentials examined in fertility among various subgroups of women are important for understanding the levels, and trends in fertility and give useful insights into the reproductive behaviour of a population, yet I would suggest that a more precise and integrated discussion of the results would make the study livelier and more meaningful.

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