Literacy Transition and Female Nuptiality: Implications for Fertility in Pakistan

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INTRODUCTION

As societies modernize, they move from a relatively homogeneous state to one of greater diversity in several spheres. Among those, changes in educational structure and marital patterns are of great demographic importance, particularly in countries experiencing a high tempo of fertility. Increased education is supposed to result in non-familial aspirations and a greater understanding of the process and ways of controlling fertility. Similarly, marriage postponement tends to shorten the period of exposure to childbearing and results in a lower fertility than is experienced by those marrying earlier, particularly in societies where fertility is confined to marriage and is rarely controlled. However, it is not clear whether there is a threshold at which education or age at marriage becomes important in determining changes in fertility behaviour. Thresholds of fertility decline due to a given level of education have been identified for specific countries at a given point in time, but results vary considerably from country to country. In places where illiteracy is high, the move from illiteracy to literacy seems significant, while in some other societies, the crucial point is the completion of primary or higher education.

Education and literacy may also affect fertility in several indirect ways. These factors include delayed age at marriage, reduction in the desired family size, increased opportunities for personal advancement, awareness of social mobility and freedom from close familial ties leading to greater chances of employment of women outside the home, and greater exposure to knowledge of and favourable attitudes towards family limitation. In reviewing the literature on the causal structure of fertility behaviour, one finds that education has been used as a proxy measure of modernization, of taste and preferences, of one's socio-economic status, and also of the housewife's time [5]. Thus, education is so intricately associated with many

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social, economic and psychological processes that its true nature of relationship with fertility remains obscure.

In traditional societies like Pakistan, because of low female status, there is less investment in the education of daughters and relatively few of them participate in the labour force. This in turn would be a concomitant of early female marriage relative to males, resulting in an early start of child-bearing and, among other things, high fertility.

Empirical evidence on the relationship between education, marriage and fertility is available in a few studies based on Pakistan's data. A small sample-based study of Lahore city indicated negative associations between educational attainment, age at marriage and fertility [1]. Two recent studies, using PFS (1975) data, have shown a negative effect of education on the number of children ever born, more significantly for those wives who had secondary or higher levels of education [3; 12]. Another study based on National Impact Survey (1968-69), revealed that wife's education negatively affected completed family size in rural areas only [8]. Results from some other studies demonstrated a negative relationship between age at marriage and fertility [2; 6; 7]. In fact a slight decline in total fertility of Pakistan has been attributed mainly to a rise in the age at marriage [2].

We recognize that Pakistan is undergoing a transition in literacy and nuptiality and it would be of particular interest to examine the effects of these two variables on fertility. This paper is an attempt to examine trends and differentials in education and age at marriage of males and females and then relate the two variables to one important aspect of demographic behaviour, namely fertility, and evaluate the implication of these relationships on reduction of fertility in Pakistan. Because of the existing educational structure of the country, where formal schooling is not attained by a majority of women, discussion on educational progress is confined to literacy differentials only.

The paper consists of five main sections. Section I discusses the data used and the statistical methods employed by us. In Section II, we show the literacy transition and differentials by urban-rural areas. Section III is focused on reviewing changes in nuptiality patterns over time. In Section IV, the impact of the two variables, education and age at marriage, on fertility behaviour is examined. Finally, Section V presents a brief discussion of our analysis.

I. THE DATA AND STATISTICAL METHODS

The data for observing literacy trends and differentials at the aggregate level have been drawn from census records of 1981, where information on literacy by age and sex is available. Literacy levels in the younger and older age groups, e.g. 15–19 and 45 and above, the two cohorts of individuals who have lived through very different times, would indicate the trends and differentials over time. Changes in

the marital patterns are observed through variations in the Singulate Mean Age at Marriage (SMAM) from various census records and also from the direct estimates of the mean age at marriage of females for different marriage cohorts based on data from the PLM Survey (1979-80) [6; 10]. For analysing the effects of selected variables on fertility behaviour, individual-level survey data have been utilized, as census data do not give information on background characteristics of women. The hypothesis laid down in this analysis is that fertility varies inversely with the age at marriage and with the number of school years completed.

II. LITERACY TRANSITION

It is apparent from Table I that Pakistan has quite low levels of literacy. However, there seems to be an improvement in literacy levels when the younger and older cohorts are compared. This increase is quite pronounced for urban females who showed almost a threefold improvement in literacy relative to males. This has resulted in a narrowing down of male-female literacy differentials to only 9 percentage points, for younger cohorts in urban areas. The reverse situation prevails in rural areas where females' progress in education is very modest when two age cohorts are compared: 2 percent in the 45—49 age group to only 11 percent in the 15—19 age group. The corresponding progress in males' literacy levels is relatively better which has resulted in enhancing literacy differentials in rural areas. Thus there is greater divergence in the urban sector (females show a difference of 22.7 percentage points between the two age groups) while the rural sector is in the early stages of the transition. The literacy gap in rural areas is widening and there is a great need to make women participate more in education so as to raise the overall levels of literacy and education.

Table 1

Male and Female Literacy Levels in Two Age Groups and Differences between them in Pakistan and Urban and Rural Areas: Census 1981

	Percent Literate in Age Group 15–19 Year		Difference Male-Female	Percent Literate in Age Group 45–49 Years		Difference Male-Female	Difference between Age Groups within each Sex	
	Male	Female		Male	Female		Male	Female
Total	42.5	24.4	18.1	27.5	6.6	20.9	15.0	17.8
Urban	60.5	51.3	9.2	47.9	19.3	28.6	12.6	22.7
Rural	33.6	11.3	22.3	18.6	2.0	16.6	15.0	9.3

Source: [11].

Note: The operational definition of literacy adopted in the 1981 census was: "A person who can read a newspaper and write a simple letter, in any language is literate".

III. CHANGES IN NUPTIALITY PATTERNS

Having observed changes in literacy levels over time, in this section we focus on revealing variations in nuptiality through a widely used measure, mean age at marriage. Based on distribution of population by marital status in various censuses and surveys, estimates of Singulate Mean Age at Marriage (SMAM)[1] and changes in proportions single of younger age cohorts are presented in Table 2. It is apparent from the table that nuptiality patterns are undergoing changes over time. The SMAM of females rose from nearly 18 years in 1951 to almost 21 years in 1981, whereas males showed an increase of two years over the same period. These estimates reveal that the tempo of change has been more rapid in the females' age at marriage rapid than in that of males. This may be partially due to the effect of increased education, particularly in urban areas where younger females have shown remarkable improvement in literacy levels.

Table 2

Singulate Mean Age at Marriage and Proportion Single in Younger Age Group in Various Census Years for Males and Females in Pakistan

| Census Year | Proportion Single | | | | Singulate Mean Age at Marriage | | |
| | 15–19 | | 20–24 | | | | |
	Male	Female	Male	Female	Male	Female	Difference (M-F)
1951	68.0	45.7	42.0	17.7	23.4	17.9	5.5
1961	83.0	46.6	52.9	12.0	24.5	17.6	6.9
1972	92.6	65.6	67.8	21.3	26.2	20.0	6.2
1979 (PLM)*	95.0	72.2	65.9	23.3	25.6	20.2	5.4
1981	92.5	68.9	64.0	24.4	25.4	20.8	4.6

Source: [10].

*Estimates based on household data of the PLM Survey of 1979-80 [6].

To further examine the changes in nuptiality in urban and rural sectors, direct estimates of mean age at marriage of females are obtained from the retrospective responses of individual-level survey data of 1979-80 (Table 3). These estimates also show a rising trend in female age at marriage. However, urban females who got married in recent years (1970–75 and 1975–79 marriage cohorts) exhibited a higher

[1] SMAM is a well known method developed by Hajnal and is widely used to show trends in age at marriage over time. In a situation of rising age at marriage, the SMAM will be over-estimated and will be greater than means based on direct responses. For details of its methods of computation, see Hajnal [4].

Table 3

Estimates of Mean Age at Marriage of Females by Years of Marriage and Urban and Rural Residence: PLM Survey 1979-80

Year of Marriage	Total	Urban	Rural
1950–54	16.4	16.3	16.5
1955–59	17.4	17.2	17.5
1960–64	17.5	17.4	17.6
1965–69	17.8	17.8	17.8
1970–74	17.9	18.5	17.7
1975–79	18.2	18.9	18.0

Source: [10].

age at marriage than their rural counterparts, implying a tendency towards delaying marriage. The table also reveals that among women married during the Fifties and the Sixties, rural women reported a slightly higher age at marriage than urban women. This could probably be due to mis-statement of the age at marriage by older rural women, they having been married in the distant past [10].

The overall findings thus point to a higher age at marriage for relatively younger urban women who have also been identified as more literate than the older women. We now turn to examine whether this sub-group of women also exhibited a different pattern of fertility behaviour.

IV. IMPACT OF EDUCATION AND AGE AT MARRIAGE ON FERTILITY BEHAVIOUR

Using individual-level information on female socio-economic characteristics from the PLM survey,[2] we have examined the differentials in fertility by education and age at marriage (Table 4). For the total sample of women, age at marriage and educational attainment emerged to be negatively associated with overall fertility. The table reveals that women married at age 25 or over had distinctly lower cumulative fertility than those married below age 15 (3.5 children on average) and those belonging to the 15–17 marriage cohort (4.4 children).

[2] The survey is based on a sample of 10098 ever-married women aged 10 to 50 years. A standard questionnaire of the Pakistan Fertility Survey (1975) was used for gathering information on fertility including questions related to marriage history and selected background characteristics of women. For details, see M. Irfan, "An Introduction to Studies in Population, Labour Force and Migration: A PIDE/ILO-UNFPA Project". Islamabad: Pakistan Institute of Development Economics, 1981. (Research Reports Series, No. 118).

Table 4

Mean Number of Children Ever Born by Age at Marriage and Education Categories: Currently Married Women: PLM Survey 1979-80

Age at Marriage	Level of Education			
	No Education	Primary	Secondary and above	Total
<15	5.1	5.2	4.9	5.1
15—17	4.5	3.9	3.6	4.4
18—19	4.0	3.2	3.3	3.9
20—24	4.0	3.1	2.6	3.8
25+	3.8	2.6	2.2	3.5
All	4.3	3.6	3.3	4.1

Source: PLM Survey, 1979-80.

The fertility of educated women came out to be lower than that of illiterate women. The difference between the cumulative fertility of women who had completed primary education and those who had secondary or higher education is of modest magnitude almost in all age-at-marriage groups. However, the differentials are more distinct between illiterates and women with secondary or higher education, particularly so in higher age-at-marriage categories, implying that higher education and delayed marriage combined have greater impact on fertility than education alone.

To get some further insight into this type of analysis, women have been divided into two broad age groups (viz. < 35 years and 35 and above) for both urban and rural settings to see if any marked differentials in fertility existed by place of residence and age (see Table 5). Fertility differentials by age at marriage persist for both young and older women but are more distinct for older urban women. No prominent fertility differentials by education levels have emerged for relatively younger women. However, older urban women who have either completed or about to complete their family size have shown some effect of education on fertility as there is a difference of about 1–6 children between illiterates and women with secondary or higher education. Older rural women show somewhat fluctuating pattern of fertility by education categories. Women with secondary plus education have greater number of children ever born than illiterates or even those women who had completed primary education in the category of those married between 15 and 19 years of age. This could be due either to relatively accurate reporting of births by a few rural educated women or to a very small size of this sub-group of women which may have biased the estimates. However, rural women marrying at age 20 or over have shown a negative impact of education on their cumulative fertility. This must be interpreted with caution owing to a negligible number of women in this category.

Table 5

Mean Number of Children Ever Born by Level of Education, Age Marriage and Place of Residence in Two Broad Age Groups: Currently Married Women: PLM Survey 1979-80

Age at Marriage	Current Age							
	<35 Years				35—49 Years			
	No Education	Primary	Secondary & above	Total	No Education	Primary	Secondary & above	Total
Urban Women								
<15	4.3	4.2*	3.9*	4.2	7.8	6.4*	6.7*	7.6
15—17	3.5	3.0	2.9	3.3	7.3	6.6	6.0	7.1
18-19	3.0	2.4	2.6	2.9	6.6	6.5*	5.4	6.4
20—24	2.3	2.3	2.1	2.2	6.0	5.6*	5.1	5.8
25+	1.8*	0.3*	1.2	1.3	4.5	4.1*	3.8	4.3
All	3.3	2.7	2.4	3.0	6.8	6.1	5.2	6.6
Rural Women								
<15	3.2	3.3	3.0*	3.2	6.7	8.0*	0.0*	6.7
15—17	2.7	2.6	2.1*	2.7	6.4	6.1*	8.2*	6.4
18-19	2.4	1.6	2.3*	2.3	6.6	5.5*	7.0*	6.5
20—24	2.3	2.0	1.8*	2.2	5.7	6.0*	3.5*	5.7
25+	1.5	1.3*	1.2*	1.5	4.4	3.0*	2.6*	4.3
All	2.6	2.2	2.1	2.6	6.1	5.8	5.3*	6.1

Source: PLM Survey, 1979-80.
*Number of women less than 30.

Since the number of children ever born is closely associated with the period of time that women have been exposed to child-bearing, it is useful to allow for duration of marriage in estimating cumulative fertility.

Use of current age ignores the wide variations in the ages at which women marry and hence have different exposure periods. For this reason, differentials in fertility by duration of marriage and the other related variables are presented in Table 6 for both urban and rural women.

The results obtained from Table 6 appear roughly in the same direction. Women with urban residence and marriage duration of 20—29 years have shown a negative effect of age at marriage and education on cumulative fertility. Differentials in fertility in other 'duration' categories are greatly minimized and become negligible for both urban and rural women.[3] In fact, no distinct differentials in fertility due to education or age at marriage have emerged for women married for up to 19 years. It may be pointed out that the findings based on longer marriage durations reflect largely completed fertility and are more conclusive while the shorter duration group has yet to complete its potential fertility.

[3] Using Multiple Classification Technique (MCA); differentials in cumulative fertility by education were greatly minimized when other factors were held constant. Age at marriage came out to be a strong predictor of fertility.

Table 6

Mean Number of Children Ever Born by Level of Education, Age at Marriage and Duration of Marriage for Urban and Rural Women: PLM Survey 1979-80

Age at Marriage	Duration of Marriage															
	<10 Years				10–19 Years				20–29 Years				30 and above Years			
	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total
Urban Women																
<15	1.7	1.6*	1.8*	1.7 (75)	5.2	5.5*	4.9	5.2 (134)	8.0	5.9	5.3*	7.7 (117)	7.7	7.3	8.0*	7.7 (123)
15–17	1.6	1.9	2.0	1.7 (449)	5.2	5.1	4.4	5.1 (482)	7.2	6.4	6.0	7.0 (342)	7.8	7.5	6.0	7.7 (206)
18–19	1.9	1.8	2.0	1.9 (319)	5.2	4.8	4.6	5.0 (250)	6.8	7.1	5.4	6.6 (157)	7.0	5.8	5.3*	6.7 (38)
20–24	1.8	1.7	1.7	1.7 (418)	5.1	4.7	4.7	5.0 (241)	6.4	6.7	4.8	6.2 (148)	4.8	5.0*	0.0	4.8 (15)
15+	2.6	0.8*	1.7	2.0 (97)	4.7	4.5*	4.3	4.6 (61)	5.6	8.0*	4.0*	5.4 (20)	–	–	–	–
All	1.8 (818)	1.8 (167)	1.8 (373)	1.8 (1358)	5.1 (878)	4.9 (107)	4.6 (183)	5.0 (1168)	7.1 (648)	6.5 (60)	5.4 (76)	6.9 (784)	7.6 (333)	7.1 (28)	6.5 (21)	7.5 (382)

Continued –

Table 6 – (Continued)

Age at Marriage	Duration of Marriage															
	<10 Years				10–19 Years				20–29 Years				30 and above Years			
	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total	No. Education	Primary	Secondary & above	Total
Rural Women																
<15	1.6	1.3	1.5	1.6 (191)	4.3	3.9*	4.5*	4.2 (220)	6.3	7.5*	0.0	6.3 (138)	7.0	5.0*	0.0	7.0 (149)
15–17	1.4	1.8	1.9	1.4 (868)	4.4	4.2	4.5*	4.4 (777)	6.4	6.5	8.0*	6.4 (576)	6.8	9.0*	9.0*	6.8 (312)
18-19	1.4	1.5	1.7	1.4 (538)	4.8	2.4*	4.4*	4.8 (336)	6.8	5.5	9.0*	6.8 (212)	7.1	4.0*	0.0	7.1 (77)
20–24	1.6	1.6	1.3	1.6 (503)	4.5	4.1	4.0*	4.5 (464)	6.4	7.0*	0.0	6.4 (329)	7.2	0.0	0.0	7.2 (47)
25+	2.2	1.2	1.5	2.1 (123)	4.4	4.5	5.0*	4.4 (125)	5.7	0.0	0.0	5.6 (49)	–	–	–	–
All	1.5 (2046)	1.6 (112)	1.6 (65)	1.5 (2223)	4.5 (1841)	3.9 (57)	4.3 (24)	4.4 (1922)	6.4 (1269)	6.2 (31)	8.5* (4)	6.4 (1304)	6.9 (576)	7.9 (8)	9.0 (1)	6.9 (585)

Note: Figures in parentheses are number of women.
*Number of women less than 10.

V. CONCLUDING REMARKS

Given the limitations of the survey data which pertain to a sample of ever-married women between the ages of 15 and 49 years, the main conclusions of the study are that a rise in female age at marriage and education at secondary and higher levels are important in affecting fertility levels. For older urban women, cumulative fertility exceeded by 3 children in early marrying cohort (15–17 years), compared to those married after 25 years of age. Rural women also showed a strong negative association between age at marriage and cumulative fertility in a bivariate classification. However, such differentials were greatly minimized when duration of marriage and other related variables were allowed for. We can not expect female age at marriage to rise beyond a certain level. Hence, as a policy measure, it may be more difficult to raise and enforce a legally high age at marriage, as early marriage is deeply rooted in the custom and tradition of the Pakistani society. However, increase and enhancement in women's education may have a positive effect on age at marriage and, through it, on fertility. It, therefore, becomes imperative that younger women, the potential group for determining future fertility levels, must be given more education, particularly in rural areas, as an alternative to early marriage and early child-bearing.

For the total sample, older urban women (aged 35 and over) with secondary or higher education had somewhat lower cumulative fertility than illiterate women. The difference between the two sub-groups was that of 1.6 children. For rural women, educational attainment had no distinct association with cumulative fertility. A lack of differential between the fertility of women with no education and that of those exposed to some years of schooling may be due more to strict adherence of illiterate women to the traditional practice of post-partum abstinence, prolonged breast-feeding and poor health of rural women which impairs fertility than to effective contraception. Evidence from the PLM survey supports this notion. For instance, the mean length of breast-feeding was higher among women with no education than among those with primary or secondary education [9]. Another possibility for this lack of differentials may be that there was a very small number of educated women in the sample, particularly of those with secondary or higher education, the level found relevant and crucial for fertility reduction.

A somewhat weak relationship of education with fertility does not dilute the importance of education as a policy variable. Although the negative effect of education (secondary and above) for older urban women applies to a small proportion in the sample, its implications for future fertility levels may be large in Pakistan. As female education becomes widespread, at least at primary or higher levels, we may expect an overall change in fertility behaviour of women. It may also affect other social and economic variables which are likely to have a depressing effect on fertility.

Besides these suggestions and implications, a few other points emerging from the study merit further discussion. The first point relates to the unchanged fertility behaviour of women in response to the social changes that we portrayed in the first two sections of the paper. Secondly, despite the fact that the urban sector is experiencing greater changes in terms of literacy/education and marriage behaviour, why is it that urban women in the sample have higher completed fertility than their rural counterparts?

In a search for finding some plausible explanations, one may come up with the argument that a relatively short length of breast-feeding among urban women, resulting in shorter birth intervals, might have resulted in somewhat higher urban fertility. The data from the PLM Survey (1979-80) partially support this argument, as the mean length of breast-feeding has declined for urban and educated women from that derived from the PFS (1975) estimates. Moreover, women in urban areas with better sanitary and health-care conditions are more fecund and end up with higher completed fertility. Another possible reason could be that urban women, being more educated, are likely to report births or infant deaths more accurately than rural women. This might have introduced some bias in the estimates. The PLM survey data have pointed to age mis-reporting and birth recall errors among older rural women. However, the data need further empirical investigation in this regard.

REFERENCES

1. Afzal, M., Zubeda Khan and N. A. Chaudhry. "Age at Marriage, Fertility and Infant-Child Mortality in a Lahore Suburb (Part–I)". *Pakistan Development Review*. Vol. XV, No. 1. Spring 1976.

2. Alam, Iqbal, M. Irfan and M. N. I. Farooqui. "Fertility Levels, Trends and Differentials in Pakistan: Evidence from the Population, Labour Force and Migration Survey 1979-80". Islamabad: Pakistan Institute of Development Economics. 1985. (Studies in Population, Labour Force and Migration, Report No. 1)

3. Casterline, John. "Fertility Differentials". In Iqbal Alam (ed.), *Fertility in Pakistan*. London: International Statistical Institute. 1983.

4. Hajnal J. "Age at Marriage and Proportion Marrying". *Population Studies*. Vol. 7. 1953.

5. Harvey, J. Graff. "Literacy, Education and Fertility, Past and Present: A Critical Review". *Population and Development Review*. Vol. 5, No. 1. March 1979.

6. Irfan, Mohammad, and G. M. Farooq. "An Investigation of Household Reproductive Behaviour in Pakistan". Islamabad: Pakistan Institute of Development Economics. 1984. (Studies in Population, Labour Force and Migration, Report No. 4)

7. Karim, Mehtab S. *Socio-Economic and Cultural Aspects of Marriage and Fertility in Urban Pakistan.* Honolulu, Hawaii: East-West Center. December 1979. (Papers of the East-West Population Institute, No. 64)

8. Khan, Ali, and Ismail Sirageldin. "Education, Income and Fertility in Pakistan". *Economic Development and Cultural Change.* April 1979.

9. Khan, Zubeda. "Breast-feeding in Pakistan". Islamabad: Pakistan Institute of Development Economics. 1985. (Studies in Population, Labour Force and Migration, Report No. 10)

10. Mahmood, Naushin, and S. Mubashir Ali. "Nuptiality Patterns in Pakistan". Islamabad: Pakistan Institute of Development Economics. 1984. (Studies in Population, Labour Force and Migration, Report No. 2)

11. Pakistan. Census Organization. *Population Census of Pakistan 1981, Census Bulletin 7.* Islamabad.

12. Sathar, Zeba Ayesha. "Does Female Education Affect Fertility Behaviour in Pakistan?" *Pakistan Development Review.* Vol. XXII, No. 4. Winter 1984.

Comments on
"Literacy Transition and Female Nuptiality: Implications for Fertility in Pakistan"

The paper examines the impact of literacy transition and female nuptiality on fertility decline in Pakistan. The data used in the paper are drawn from the 1981 Census and the PLM Survey, with far greater reliance on the latter. The PLM Survey, besides suffering from inherent problem of a small sample conducted over a long time period, produced poor quality data. It is well known that the researchers at the PIDE kept on churning the PLM data till they could find some cream out of it. One of the inconsistencies of these data is indicated in Table 5 which indicates that women with secondary plus education in rural areas have greater number of children ever born than illiterate woman. As PLM Survey is the latest survey conducted, the authors probably had no choice but to rely on it and use it for whatever it is worth. The methodology is multiple-classification analysis which is a standard technique for netting out the effects of one or two variables in a multiple-causation phenomenon.

The dependent variable is the number of children ever born and the independent variables are the level of education and the mean age at marriage. In this case both the independent variables are correlated as those females who go in for higher level of education, especially secondary plus, are also those who marry at higher age. Normally, a woman who has graduated marries at 20 plus. Hence in this case it is very difficult to state whether her lower fertility is due to the higher level of education or to higher age at marriage.

The authors have stated that in Pakistan there is a rapid literacy and nuptiality transition. I beg to differ with this observation. The female literacy in Pakistan is moving very slowly. It has increased from 6 percent in 1961 to 16 percent in 1981. In other terms the female literacy level has been increasing at half percent per annum. Hence there is no rapid transition in female literacy in Pakistan but a very slow increase — an almost glacial change. On the other hand, the increase in the age at marriage has been well documented in all the surveys, especially in PFS which concluded as follows:

> The figures indicate that over a period of approximately 30 years, mean age at first marriage among females in Pakistan was subject to an increase of over three years; from 16 years for the cohorts currently 40—44 and 45—49 years old.

This is also not rapid. The exact change in the dependent variable, viz. number of children ever born, has not been correctly measured by demographers. Probably there is a 10-percent decline in fertility over a 30-year period. Some estimates would put it even less. However, all indicators and measures, whether it be CBR or GRR, put Pakisan's fertility rate at a higher level and with the lowest rate of decline as compared to other South or East Asian Countries.

The impact of higher age at marriage on decline in fertility has been well established in a number of studies quoted in the paper. The authors have correctly pointed out that we cannot expect the age at marriage to rise beyond a certain level. It has risen by 3 years and can only rise by a year or two over the next two or three decades. The major impact of the increase in the mean age at marriage on decline of the fertility has been exhausted. The creeping increase in age at marriage in future years will only make a very small contribution to fertility decline.

The impact of educational attainment on decline in fertility is complex. The authors start by quoting the result of an extensive review — "educational attainment has a consistently inverse relationship to fertility in about all cases". They however, conclude by stating that contrary to general expectation, no significant relationship has emerged between fertility and education in Pakistan. One wonders why Pakistan's experience is different from those of almost all other countries. Firstly, it must be pointed out that whereas educated women report their births correctly, illiterate or semi-literate women supress their births, especially of children who died in infancy. Secondly, what is important for decline in fertility is not only the level of educational attainment but the type and content of education. If the education is such that it reinforces fatalistic belief in birth of children or number of sons required, then fertility will not decline. Only infant mortality will fall. Education will have impact on decline in fertility only if it leads to a change in attitudes — personal, social, moral and national responsibility to rear up healthy, educated and well-brought-up children. This change in attitudes in Pakistani context only comes if females are graduate plus, who were only 6 percent of the educated 16 percent in the 1981 Census or 1 percent of the total.

In conclusion I would recommend that the researchers and demographers of the PIDE should not conduct research on factors which have led to fertility decline in Pakistan as, besides the well-established impact of increase in mean age at marriage on decline in fertility, there is nothing more to be researched on the subject as other variables are changing very slowly. In fact, research should be conducted on what prevents fertility in Pakistan from declining whereas it is sharply declining in many of the neighbouring countries. I congratulate the authors on their research and excellent analysis, but I would very strongly suggest that they should change their

focus to analysing the high and almost frozen level of fertility in Pakistan. Why are the glaciers of female illiteracy and high fertility melting at a painfully slow rate in Pakistan? Once the former melts rapidly, it will certainly drag along the latter.

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