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How Female Literacy Affects Fertility: The Case of India

A RECENT study from India demonstrates that improvements in female literacy have a direct effect on reducing fertility. Examining data from 326 districts in 14 states, covering over 90 percent of India's total population, researchers found a significant relationship between female literacy and fertility levels. In districts where a high proportion of women could read and write, the average number of children per woman was considerably lower than in districts where literacy levels were low.

Also, in high-literacy districts a greater proportion of children survived infancy. Lower child mortality, in turn, contributed to

lower fertility rates. Both directly and indirectly, higher female literacy resulted in lower fertility.

Despite improvements in female literacy levels in India, only about one Indian woman in four is literate. The percentage is even lower in rural areas, where the majority of Indians live. If the Indian government can speed the achievement of its goal of universal literacy, it will help achieve lower fertility.

Other studies in developing countries have also found a correlation between rising female literacy and falling fertility. The research in India supports the growing recognition that in developing nations progress toward female

literacy will help governments reach fertility reduction goals.



Evidence is increasing that in addition to family planning programs and public health measures, efforts to raise female literacy levels are critically important to reducing national fertility.

Literacy and Fertility

IN developing countries, achieving higher female literacy rates is one of the keys to reducing fertility levels. As literacy levels rise, fertility falls for several reasons: Women who can read and write tend to become more knowledgeable about family planning and more likely to use contraceptive methods. Whether in urban or rural areas, a literate population speeds the diffusion of information about family planning, education, and health care.

Women with literacy skills and education are also more likely to have interests outside their immediate family, and to play social roles beyond childbearing. They marry later than women with less education. Their family size is accordingly smaller. Also, because literate women are better informed about health and hygiene, and typically live in better conditions, more of their children survive. Their fertility need not be as high to achieve their

desired family size.

A recent study of literacy and fertility in India suggests that improvements in female literacy would hasten fertility decline. Literacy rates have risen during the past half century in India, but they remain relatively low. According to the 1981 census, the most recent source of data, 36 percent of India's population is literate, up from 16 percent in 1941.

Although female literacy more than tripled between 1941 and 1981, while male rates doubled, female literacy remains much lower than male literacy. The female literacy rate in 1981 is no higher than the male rate was in 1941. Nearly half of males in India are literate, but only one-quarter of females, the 1981 census reported (Figure 1).

The Study

THE Office of the Registrar General, India, and the East-West Population Institute,

Honolulu, Hawaii, studied the relationship between total fertility rates, female literacy rates, and child mortality rates in 14 major states of India. Researchers O. P. Sharma and Robert D. Retherford analyzed data from 326 districts within these states. Together, these areas include 93 percent of India's population.

The researchers found that in states where female literacy rates are high, fertility rates typically are low. In those states that have low fertility rates, child mortality rates also are low.

In India, literacy is defined as the ability to read and write with understanding in any language. Children under the age of five are defined as illiterate. The literacy rate is the percent literate in the total population. The female literacy rate is the percentage of females who are literate.

The total fertility rate (TFR) is the number of live births a woman would have over her reproductive lifespan at current age-specific birth rates. In this study, the child mortality rate is defined as the probability of a child dying before reaching the age of two.

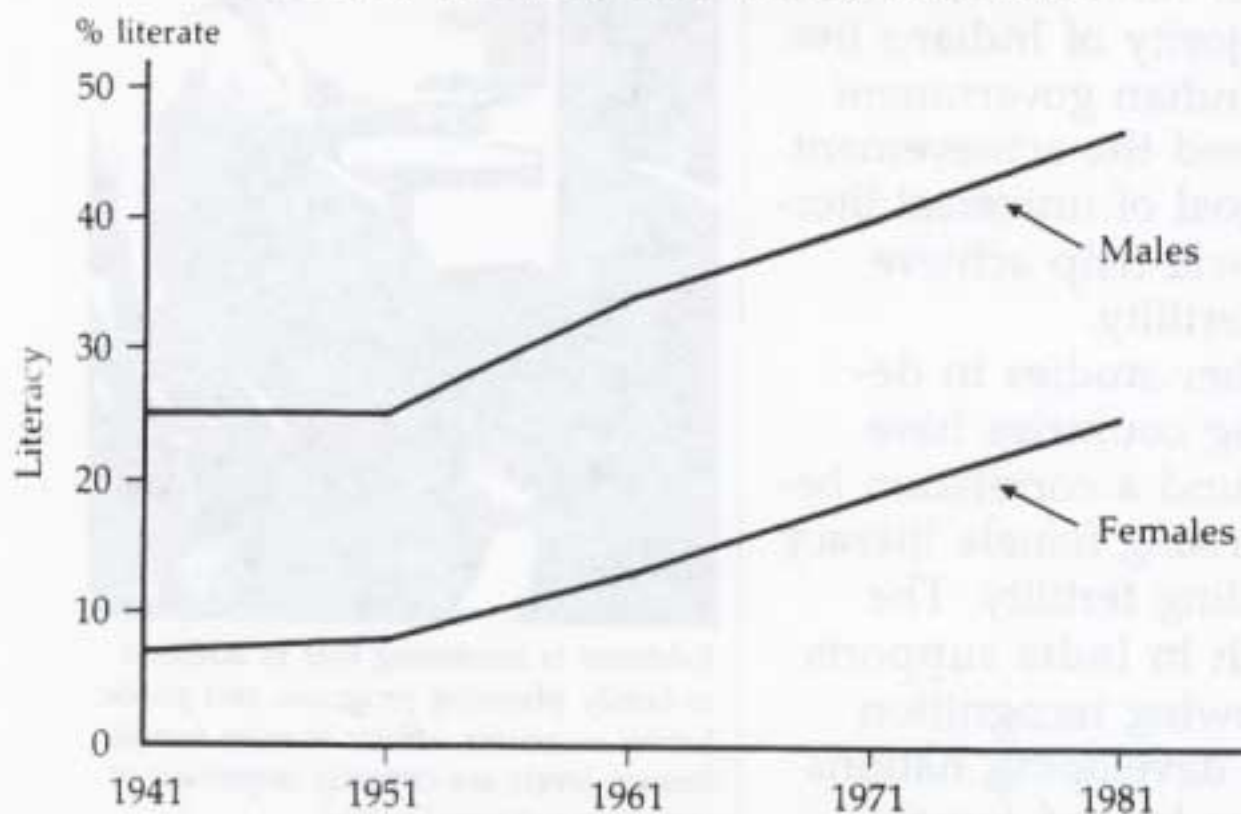
For the 14 major states studied, the female literacy rate was 22 percent; the child mortality rate was 126 (per 1,000 births), and the total fertility rate was 5.0 children per woman. But there was wide variation among the states (Table).

In Rajasthan, the state with the lowest female literacy, 11 percent, fertility was the highest of any state, 6.0 children per woman. In Kerala, where female literacy was a very high 65 percent, fertility was near the bottom of all states, 3.4 children per woman. No state with above-average fertility had higher than average female literacy.

The evidence was also strong that child mortality and fertility are related. In low-fertility Kerala, for example, child mortality was the

Figure 1

Literacy rates, by sex: India, 1941-1981



Source: Sharma and Retherford (1987).

lowest of any state. Only one state with below-average fertility, Orissa, had above-average child mortality. The three states with the highest fertility, Madhya Pradesh, Uttar Pradesh, and Rajasthan, also had by far the highest child mortality rates.

Using multiple regression analysis, the researchers demonstrated that an increase of 10 percentage points in the female literacy rate would result in a fertility reduction of almost one-half child per woman. A district in which 20 percent of the women were literate would have a total fertility rate of 5.1 children per woman. If a district's female literacy rate were 80 percent, the predicted TFR would be 2.3 children per woman. Among the 14 states there is substantial fluctuation in the relationship between literacy and fertility, but the general relationship is significant (Figure 2).

About half of the effect of female literacy on fertility is direct, and half indirect, chiefly through literacy's effect on reducing child mortality. Women who can read and write typically have more surviving children, because they are more aware of good health and nutrition practices and live in better circumstances. With more surviving children, couples need fewer births to attain their desired family size. For breastfeeding women, improved child survival means longer periods of protection against pregnancy.

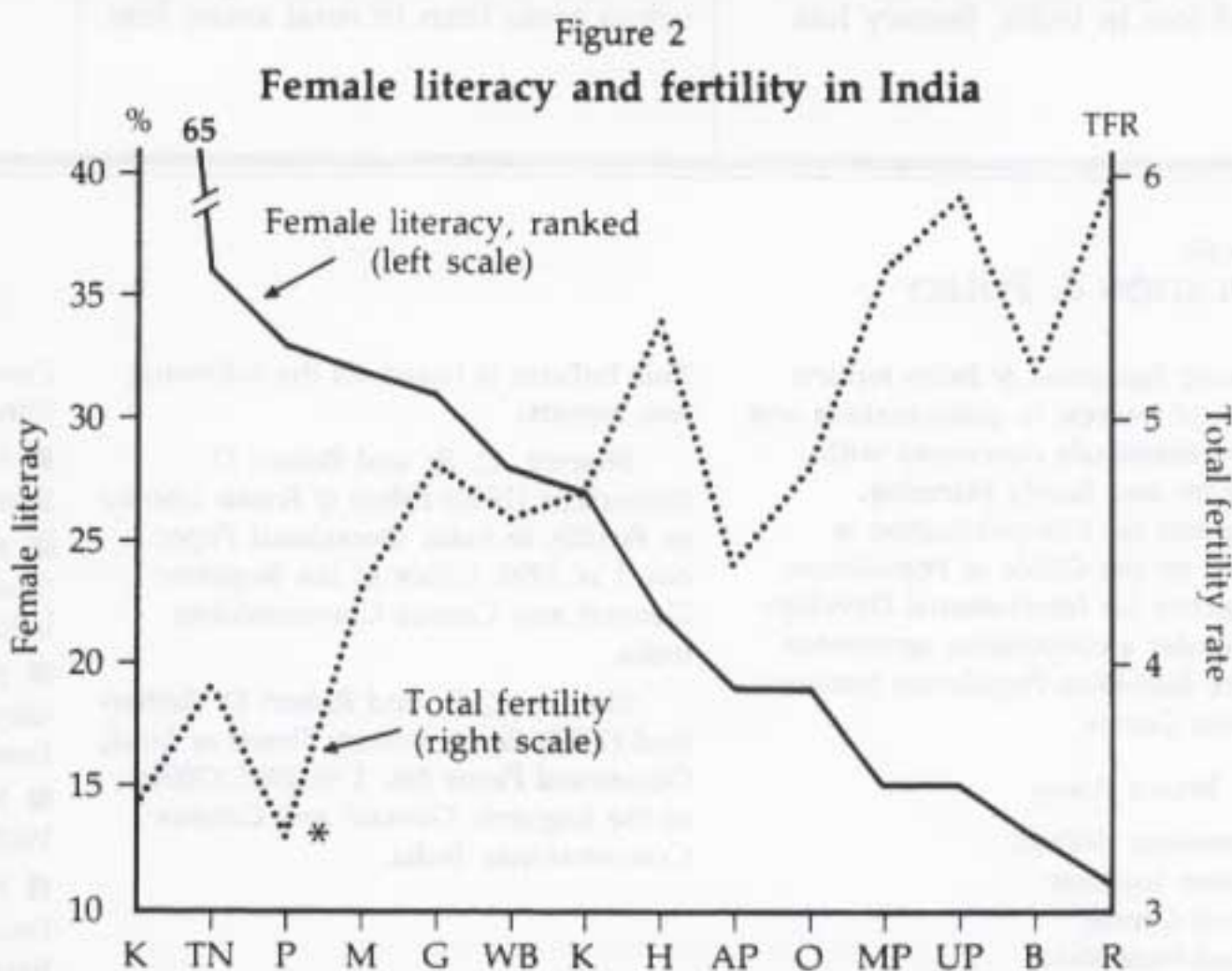
Researchers Sharma and Retherford found that female literacy also has an indirect effect on fertility through the age at marriage (literate women tend to marry later), but this relationship is of minor importance when compared with the major indirect effect through child mortality. Also, the researchers found there was little change in the relationship between literacy and fertility when they statistically controlled for the level of urbanization.

Table
Female literacy, child mortality, and fertility:
14 states of India

States (ranked by female literacy rate)	Female literacy rate (%)	Child mortality rate (per 1,000)	Total fertility rate (TFR)
Total: 14 states	22	126	5.0
Kerala	65	56	3.4
Tamil Nadu	36	99	3.9
Punjab	33	95	3.3*
Maharashtra	32	121	4.3
Gujarat	31	103	4.8
West Bengal	28	101	4.6
Karnataka	27	102	4.7
Haryana	22	120	5.4
Andhra Pradesh	19	107	4.4
Orissa	19	149	4.8
Madhya Pradesh	15	166	5.6
Uttar Pradesh	15	150	5.9
Bihar	13	111	5.2
Rajasthan	11	145	6.0

Source: Sharma and Retherford (1990).

* The TFR for Punjab may be understated, since it is the only state for which the researchers could not adjust the TFR to improve accuracy, due to inconsistencies in the data.



(States ranked left to right by female literacy rate—see table for state names.)

Source: See table.

* See footnote for Punjab TFR in table.

Policy Implications

THE fact that the female literacy rate has a strong effect on the total fertility rate in India has important implications for national policy. Higher female literacy rates would benefit India not only by improving the productivity of the labor force and the ability of women to participate in the modern sector of the economy, but also by helping to solve the problem of rapid population growth.

If female literacy rates were to rise rapidly in India, it could accelerate the achievement of lower fertility rates. This, in turn, would speed the achievement of other national development goals that are hindered by rapid population growth. Fertility reduction and improvement in female literacy are complementary, in that the achievement of one makes it easier to achieve the other. Both help to raise living standards.

Although female literacy rates are still low in India, literacy has

been rising. A higher proportion of young people than of older people are literate. Only about 30 percent of Indians aged 35 or older are literate, versus over half of people between the ages of 10 and 25. These statistics indicate that in the future a growing proportion of women in their childbearing years will be literate. This trend should speed the adoption of family planning. Higher literacy is likely to increase the demand for family planning services, because literate women respond better to appeals to limit family size and are more likely to seek information about contraceptive methods.

Although fertility has declined in recent years, India's population continues to grow rapidly. As a result, despite increases in female literacy, there are far more illiterates today than a few years ago. These facts place a heavy burden on programs to improve literacy and reduce fertility.

Also, while literacy is higher in urban areas than in rural areas, less

than one-fourth of India's population is urban. In rural areas, less than one-fifth of females are literate, versus nearly half in urban areas. This fact demonstrates the importance of reaching the rural areas both with literacy and family planning programs.

At the current rate of literacy improvement, it could take India at least 70 more years to reach its goal of universal literacy. "This goal could be achieved sooner if current efforts to accelerate the pace of educational improvement are successful," according to researchers Sharma and Retherford.

Literacy's strong fertility-reducing effect adds to the rationale that supports the Government of India's current efforts to accelerate progress toward the national goal of universal adult literacy. The evidence from India is that improvements in female literacy contribute substantially to development.

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Sharma, O.P., and Robert D. Retherford (1987) *Recent Literacy Trends in India*, Occasional Paper No. 1 of 1987, Office of the Registrar General and Census Commissioner, India.

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