Pergamon

www.elsevier.com/locate/worlddev

World Development Vol. 30, No. 10, pp. 1779–1790, 2002

Printed in Great Britain
0305-750X/02/$ - see front matter

PII: S0305-750X(02)00072-4

Why does Education Lead to Lower Fertility? A Critical Review of Some of the Possibilities

ALAKA MALWADE BASU *
Cornell University, Ithaca, NY, USA

Summary. — In spite of close to a quarter century of research and policy interest in the quite uniquely universal negative relation between female education and fertility, the mechanisms behind this relation continue to intrigue and to fascinate. This paper tries to review critically some of the more common mechanisms suggested by the literature and offers a new look at some alternative possibilities.

1. INTRODUCTION

Studies of fertility decline in the developing world have come to different conclusions about the presumed causes of these declines. [1] But there is near unanimous agreement on two of the strongest influences on reduced fertility at both the individual and the community levels. These two influences are (a) the status of women/mothers (as measured by a number of indicators, but referring finally to some notion of gender equality, which is usually not the same thing as "prestige") and (b) the education of the women who become mothers. There are exceptions, of course, but on the whole the exceptions only serve to strengthen the case that these two indicators (gender equality and female education) both tend to depress fertility.

The exceptions tend to be of two kinds. In the first kind, we have a few cases where gender equality or female education can actually *increase* (but more usually, leave unchanged), fertility levels. This anomalous result tends to be treated in the literature as being due to rises in fecundity (through factors such as reduced breastfeeding) rather than to rises in volitional fertility, but this assumption deserves further analysis than it has received thus far. [2] The second set of exceptions relate to cases where significant fertility declines have occurred in spite of the absence of any noticeable changes in gender equality or female education.

The strength and the universality of the association between fertility and measures of gender equality and education has, not surprisingly, resulted in much speculation about the relation between education and gender equality. It has also led to the hypothesis that in fact education reduces fertility through the mediating effect of the gender equality that it encourages. Gender equality in this framework refers primarily to women's control over resources and their own lives. This is another way of saying that, in a system of gender equality, women have the autonomy to make decisions and to act on these decisions, whether these are decisions about household matters, the use of resources, or about their own right to mobility and to interaction with the outside world.

Education or schooling is expected to contribute to all of these measures of female autonomy. In addition, it is believed to provide women with the tools to make informed or intelligent choices on these matters as well as to increase the confidence needed to act on these choices in the frequent face of opposition both within and outside the family (for a review of the literature on this matter, see Jejeebhoy, 1995).

While this hypothesis is broadly plausible, once again there are exceptions, and ambiguities (see, for example, the papers in Jeffery and Basu (1996)). These exceptions suggest that while the primary impact of female education may be to increase the chances of gender equality and therefore increase the chances of volitional fertility decline, education may also affect fertility through measures that do not involve a real change in the gender status quo.

*Final revision accepted: 26 March 2002.

In this paper, I explore some of these other measures. That is, while accepting the general proposition that gender equalities lie behind the education-fertility relationship, I try and look for other mechanisms that may also contribute to this relationship.

In the following sections, I look at some of these other possibilities in different ways. That is, there is no one category of possible explanations I explore. Instead, the first factor I look at is a negative one—the number of ways in which education may in fact *reinforce* gender inequalities. The most important of these is the content of most schooling and the values that it seems to impart. Then, I consider the possible role of men—by looking at one way in which the educated woman may end up in a marriage that gives her a more equal relationship with her husband, or may end up in an unequal but nevertheless "modern" marriage through factors that exist prior to her marriage and thus are not the cause of *changing* power relationships within marriage. Finally, I look at two other strongly possible mechanisms behind the education-fertility relationship—the relationship between education and mortality and the relation between education and material aspirations.

2. THE CONTENT OF SCHOOLING

The remarkable impact of education on fertility as well as on several other factors of social development in the developing countries has generated much research interest in the question of what is it about schooling that causes this jump into the modern world. I use the terms "modern world" advisedly, to underscore that the counterpart of literacy is not illiteracy (with all its negative connotations of ignorance, irrationality and so on) but *nonliteracy*; and nonliteracy is often a feature of "nonmodern" societies in the sense of being nontechnical and non-Western, rather than nonthinking.

Life in a rapidly changing and modernizing world however undoubtedly favors those with the modern skills provided by schooling; the surprise is that schooling results in all these positive outcomes without there being much that is compellingly positive about the typical developing country schooling experience. It is not simply a question of the knowledge and information unavailable from schooling. Even the values and world-views that much schooling in the developing world fosters often hardly seem conducive to producing the relatively self-confident and effective mother and family-planner that the educated woman appears to be. As discussed in Jeffery and Basu (1996) as well as in several anthropological accounts of schools for both poor as well as well-off girls, the dominant habits that schooling teaches girls are discipline, self-restraint, patience, routine, and obedience of authority. This model seems to apply to the school experience of all parts of the developing world.

It is thus difficult not to feel that there is something about the *fact* of going to school or being schooled, independently of what school itself teaches, that must account for at least a part of the highly changed individual that the schooled girl becomes. In that case, research that looks at some of the impact of two factors may be worthwhile—the impact of getting out of the home every day; and the impact of daily interaction with unrelated members of one's age group. For example, both these things happen with the experience of child labor and apprenticeship, but do the latter also lead to subsequent lower fertility? Probably not; these are some of the questions worth looking at, but are not a part of the present paper.

3. MARRIAGE AND THE SELECTION QUESTION

The question of whether educated women are selected in some way for other characteristics that may also be related to lower fertility is a question that has received much, and increasingly sophisticated, statistical attention. Current data analysis introduces a variety of socioeconomic controls to isolate an impact of education/literacy/schooling and most of them continue to find a strong continued negative relation between female education and fertility even after factors such as income, husband's education, occupation, and so on are controlled for. This is gratifying, because it suggests that education really is a powerful tool even when it is randomly distributed. It is also a little surprising, because in a system of low societal educational levels, one would expect the selection of girls for education to be random.

This kind of selection has been discussed in the literature, but has not led to much compelling insight. I think this is at least partly due to the kind of data we currently have to address questions of selection. Our control measures may be too simple. It would be ideal if we had

longitudinal data to understand which girls get any schooling in situations in which schooling for girls is not the norm.

Statistical analyses which control for standard (but nevertheless cross-sectional) socio-economic factors could in principle overstate the role of gender equality as an intervening variable if they draw this conclusion only because men's educational levels seem to be so much less relevant for fertility decline. On the face of it, this finding supports the proposition that there are some gender issues involved. A plausible hypothesis that follows is that that educated women have a single-handed role in their lower fertility. In turn, this is taken to suggest that women's autonomy is important for fertility to fall (a proposition first put forth by Dyson and Moore (1983)). This conclusion is buttressed by the several studies which do indeed find that educated women have more freedom in decision-making and action on a range of domestic and extra-domestic matters (see, for example, Basu, 1992; Morgan and Niraula, 1995; Vlassoff, 1996; and the reviews in Jejeebhoy (1995) and Sathar (1996)). But, from this conclusion (that educated women have greater autonomy as well as lower fertility), an implicit conclusion is drawn which may have a less empirical basis. This is the conclusion that educated women have greater *reproductive* autonomy than uneducated women. Underlying this deduction is the implicit assumption that there is somehow an intra-household conflict in reproductive preferences which is resolved in the woman's favor when she is educated and therefore has greater autonomy in reproductive decision-making.

Can we assume that the husbands of educated women are the kind of men that need to have their reproductive goals changed or overruled by their educated wives? That is, is reproductive autonomy an essential ingredient of the education-fertility relation? I explored this question in Basu (1999) and concluded that educated women tend to marry men who share their reproductive preferences and that intra-household gender inequalities in day-to-day life need not imply gender inequalities in reproductive goals. I argued in this paper that there is something special about the educated man who marries an educated woman, even if the educated man *in general* has much less to distinguish himself than the educated woman. Merely by marrying an educated woman, this man is saying something about himself; he is not just a random educated man who then has his attitudes and preferences molded by his educated spouse.

This hypothesis is not inconsistent with the empirical finding that the wife's education has a much clearer relation to fertility than the husband's education. The special feature of the husband of the educated woman is not his education; he is instead selected for other characteristics which standard surveys have not attempted to capture. [3]

To begin with, given the norm that women marry men with more education than themselves and the fact that men are much more likely to be educated than women, it is not surprising that many men with some education marry women with no education. All data sets confirm this.

Educated men are not however, randomly distributed across educated and uneducated wives. If they were randomly drawn, it is true that a strong relation between female education and fertility and a relatively weak one between male education and fertility would imply that it was indeed the woman's education which had the primary or even sole impact on reproductive behavior, with men's reproductive goals being immaterial or even contrary to women's as is often implied in the literature.

How can one deduce that educated men who marry educated women are in some way different from educated men who marry uneducated women? Such a deduction does, of course, make intuitive sense; marriage is too important a life event in most societies to be left to random circumstances. Conscious decision-making is involved, and both the individuals concerned (or, more commonly, the families of both the individuals concerned) have a list of preferred characteristics, whether these preferences are dictated by norms, by ambitions or by tastes. The nature of these preferred characteristics in turn tells us much about the nature of the individual or family having these preferences. So the educated man (or the family of the educated man) who marries an educated woman is saying something about his preferences given that he has a pool of educated and uneducated women to choose from. It is true that the preferences of the educated woman in the marriage market are less transparent in this specific regard, given that she is effectively barred from choosing her partner from the larger pool of uneducated as well as educated men.

It thus follows that the educated man who marries an educated woman is displaying a

different set of preferences from the educated man who marries an uneducated woman, a difference that cannot be accounted for by their relative levels of education. A field inquiry seeking to discriminate between these two sets of men therefore would not get very far by focusing on their education. One needs information about other aspects of their lives and personalities.

Basu (1999) proposed two possible kinds of empirical and measurable ways of demonstrating that there are indeed two kinds of educated husbands. The first one focuses on demonstrating a similarity between educated women and their husbands, so that it is possible that the lower fertility of educated women is not an outcome of their ability to reject the different reproductive goals of their husbands but an outcome of having husbands who think like them. The second kind of evidence would try to identify some of the ways in which educated men who marry educated women are different from those that marry less educated women, even *before* they get married. That is, what relevant *background* characteristics could distinguish these two sets of men?

To begin with the first line of evidence, several reviews (see, for example, Bankole, 1992; Ezeh, 1993; Jeffery & Jeffery, 1993; Mason & Taj, 1987; Stycos, 1996) conclude that it is difficult to find really clear stated differences in the fertility goals of husbands and wives. But then, this similarity could merely reflect a convergence of goals because the husbands of educated women have been persuaded to accept the lower fertility goals that their wives bring to the marriage. So this form of evidence does not negate the possibility that gender relations are an important part of the education-fertility relation. To get a handle on this latter possibility, we need to somehow know the fertility goals of these men *before* they got married.

To consider this more compelling line of evidence—that the husbands of educated women are different to begin with and do not just change after marriage to an educated woman—the fact that male education itself has only a weak relationship to fertility is not surprising. In most parts of the developing world, and especially in contemporary South Asia, families are very well aware of the returns to schooling and, increasingly, are even embarrassed about illiteracy, especially in males (see, for example, Jeffery & Jeffery, 1993). In addition, the education of sons faces no cultural or attitudinal inhibitions. I have yet to come across a survey in which the bulk of respondents did not reply "as much as possible" when they were asked how far they would like to educate their sons. The bounds of this possibility are set primarily by resource availability, so that male educational levels are a proxy for the schooling facilities and financial resources available to households rather than for the household attitudes and values which female education more often reflects. [4] Educational differentials in men thus capture little more than their resource differentials. In addition, we know from a mass of research on historical and contemporary populations that economic factors can explain fertility declines only imperfectly. Thus, if the male is the unit of analysis, we need markers other than education to identify the bundle of values and attitudes that go to make up the "modern" world-view if we want to relate male characteristics to fertility. [5]

In principle, it should be quite straightforward to collect empirical information on differentials *within* educated men. The trouble is that most data sets have not gone beyond searching for other proxies for education to capture such differentials. Thus, income, occupation, and some background family characteristic (such as caste in the Indian context) are the kinds of things measured by most large surveys. What we need is some information about differences in the *world-views* of different kinds of educated men. Do some educated men (and, by extension, their families) live by a different set of values and have a different set of attitudes toward life from other educated men? Is this what makes them gravitate toward educated women when the time comes for them to marry?

Fortunately, information on *premarital* differences in world-views does not require any specialized survey instruments. One does not need to devise psychological tests of modernization to pre-identify the educated man who prefers an educated wife. One can, of course, ask young unmarried men about their preferred spousal characteristics. But such a measure would suffer from the same kind of potential biases as any attitudinal questions asked in the impersonal style of a survey.

In Basu (1999) I tried a much simpler measure of background modernization. If one assumes (and quite reasonably) that female education is as much an *outcome* of modern attitudes and values as it is a determinant of these, one potential way of classifying educated men (and their families) according to these at-

tributes would be to look at the investment made in the education of their sisters. [6] The education of their sisters cannot logically be the result of the educated women that these men marry, unless their sisters are very much younger than they are. If one can demonstrate in this way that educated men who marry educated women come from backgrounds which are already relatively modern to begin with, then one must give less credence to theories which explain the lower fertility of educated women in terms of their own characteristics alone.

Most data sets in demography already routinely collect some background information on all household members. From this it should be possible to measure the educational levels of the girls and women in the husbands' natal families and to relate these to the educational levels of the wives of these men. If such a relationship does indeed exist, then it will provide strong empirical support for the thesis that there are different kinds of educated men. The hypothesis is that households in which *both* sons and daughters get an education are qualitatively different from those in which only the sons are sent to school (or remain in school for any length of time); and the men who marry educated women are more likely to belong to the former.

In Basu (1999), I attempted such an analysis using the Indian National Family Health Survey data. My results were primarily indicative since the data have many limitations; [7] nevertheless the results are strongly indicative. Educated women are much more likely to marry into homes in which the daughters are also educated—while only 28% of the husbands of illiterate women in this analysis were illiterate themselves, as many as 71% of the sisters-in-law of the illiterate women were illiterate. On the other hand, while 90% of the husbands of women with seven or more years of schooling had seven or more years of education themselves, 74% of the sisters-in-law of these educated women were also as educated as the women. That is, sex differences in education were much higher in the families of the men who married less educated women.

In turn this suggests that the families of the educated men that choose educated women for marriage are qualitatively different from the families of the educated men which choose less educated or illiterate wives. This finding is not simply one more demonstration of the existence of positive assortative mating for education. For one thing, while it is true that the more educated the woman, the more educated her spouse, it is not similarly true that the more educated the man, the more educated his spouse. Instead, from the husband's perspective, the assortative mating occurs for his sisters' education and his wife's education. That is, the more educated his sisters, the more educated his wife. The resultant implications for fertility could be clinched further by analyses that try to estimate the relationship between the woman's sister-in-law's education and her fertility, controlling for her own education. According to the present hypothesis, this relationship would be stronger than that between her husband's education and her fertility.

In other words, what we see here is a case of *educational hypergamy* for women (that is, women tending to marry men more educated than themselves) but a continuing *social homogamy* for spouses (that is, a tendency for spouses to belong to similar social backgrounds). This combination of educational hypergamy and social homogamy is not unique to the Indian case used to illustrate the present paper; instead it seems to be a feature of most societies in most parts of the world (see, for example, Bozon (1991) for France).

I have gone into so much detail on this one point only to illustrate some of the possibilities that could be explored to refine our hypotheses about the role of gender as a mediating factor in the education and fertility relationship. It does not, of course, cast any serious doubts on the fact of a female education and fertility relationship; what it tries to do is to seek some mechanisms for this relationship that may exist independently of or in addition to a gender-equality mediated one. In the following sections, I consider in more detail some of these other mediating mechanisms that may also exist. I focus on two—the mediating influence of declining child mortality and the mediating influence of rising material aspirations, both of which seem to change with education and may account for some of the impact of female education on fertility.

4. OTHER POSSIBILITIES

From a reading of the newer literature on the determinants of fertility decline in South Asia in particular and the developing world in general, two factors stand out which might help us to understand the pathways through which

female education has such a strong inverse impact on fertility, whether or not it also operates through an increase in gender equality. One of these factors operates at the level of modifying the supply of children while the second one seems to reduce the demand for them. In both cases, the ultimate outcome is a reduction in the number of births.

(a) *Declining mortality*

The first of these is the mediating role of infant and child mortality in determining final fertility levels. Several demographers today are convinced that decreases in infant and child mortality are the prime determinants of falling fertility, usually well before there is any change in the demand for children. At high levels of child loss, even if fertility is high, the supply of *surviving* children is often below its demand. But once child survival improves, the supply of children can exceed its demand unless there is a corresponding fall in fertility. If that is the case, and given that the negative relationship between maternal education and child mortality is, if anything, even more clear-cut, universal and linear that that between education and fertility, understanding some of the mechanics behind the education-mortality relationship may help us to unravel some of the effects of schooling on women.

Are changes in gender equality within the household necessary for infant and child mortality to decline? In principle, they are not, except in a few specific ways. The proximate determinants of infant and child mortality are generally of the kind that can be influenced by characteristics and abilities of women that may not have much to do with their status at least within the home. Or indeed, outside the home. For example, analyses from the Indian NFHS survey (Kishor & Parasuraman, 1998) clearly suggest that employment of women (one indicator of women's independence and authority) is associated with higher infant and child mortality. This is probably because of an incompatibility between employment and childcare in a world in which childcare remains an overwhelmingly maternal responsibility even in the most advanced societies. Indeed, from the child survival point of view, education may lead to better survival precisely because (at least at low levels of development and low levels of education) it is associated with lower rates of labor force participation.

What about increases in female autonomy independent of labor force participation? If we accept (and this seems to be a reasonable presumption) that on the whole families share child survival objectives, then educated women may be accorded greater authority in childcare decisions by virtue of their presumed superior knowledge without any corresponding effort within the household to honor this superior knowledge with greater gender equality in other matters as well. That this gender equality is not readily granted is suggested by the frequent finding that while educated women have much better child survival rates, they continue to experience sex differentials in child survival, differentials which may sometimes even widen with maternal education.

Indeed, it may be precisely the more conservative attributes of schooling—the routine, the discipline, the obedience of authority that is inculcates—that may make educated women particularly able to improve the survival chances of their children. Sarkar's (1997) description of the introduction of "clock-time" into a modernizing and educationally growing Bengal has much relevance to these issues. So much of child survival hinges on well-followed routines of care and treatment, on understanding and obeying the instructions of medical practitioners, on seeking prompt medical help for child illness in the first place, that it is not surprising that educated mothers have an enhanced capacity to manipulate the environment of child survival.

(b) *Rising aspirations*

Whatever the role of declining mortality in reducing fertility (which can and probably does happen without any change in the demand for living children), it does seem to be the case that the desired family size (that is, the number of living children wanted) also goes down with education, and especially at educational levels that go beyond a few years. It also goes down with even a few years of education in societies in which education of women is more widespread (Diamond, Newby, & Varle, 1999; Jejeebhoy, 1995; United Nations, 1987, 1995). The question then is, what does education do that leads to this lowered demand for children?

One mechanism behind the education-fertility link is suggested by emerging data analyses of the relationship between exposure to the mass media and fertility. Most of the information on this relationship comes from data collected

since the mid-1980s, when the DHS surveys began and included specific questions on access to radio and television, as well as frequency of exposure to these two channels of exposure to the larger world. If one were to choose the key findings from these studies, three points would emerge that are fairly generalizable:

(i) Regular exposure to mass media is one of the strongest predictors of fertility, desired family size, and contraceptive use in most parts of the developing world (see, for example, Ramesh, Gulati, & Retherford, 1996; Westoff, 1999; Westoff & Bankole, 1999; Westoff & Rodriguez, 1995). Indeed, it is often even stronger than schooling for women, although it is difficult to actually compare the two factors, given the very different units of measurement involved.

(ii) Although the exposure to specific messages on family planning does seem to increase couples' propensity to use contraception, the larger effect seems to be of exposure to mass media independently of exposure to birth control-related information.

(iii) Women's education seems to affect strongly their exposure to the mass media. Although this has not specifically been demonstrated (or tried to be demonstrated to the best of my knowledge), this exposure to the media variable may well be an important mediating factor in the relationship between education and fertility.

What is one to make of this combination of findings? Can one use them to speculate about some of the ways in which education may affect fertility? One model that makes speculative sense in this context is one that relates declining fertility goals with rising aspirations—for one's self and for one's children. In this model, how much one invests altogether in children and in other goods depends on the resources available for such investment; but how one distributes these resources among children and other goods depends on one's priorities and on what it is possible to invest in the first place. That is, one can only invest, for example, in children's schooling if such schooling is available, and one can only buy a bicycle if there is a bicycle to be bought with one's money.

More important, before one can make these decisions one has to know about these alternative possibilities for investment and one must be *attracted* to these different forms of investment and consumption. It is on both these scores, and especially on the second matter—that of making certain kinds of consumption expenditure very attractive—that the mass media win hands down.

There is, of course, a large literature in both psychology and sociology on the role of the mass media in fostering consumerism. While much of this literature focuses somewhat censoriously on the conspicuous consumption and the wasteful consumption (greed, not need, is believed to be its primary inducement to consume) that the mass media encourage in the developed as well as the developing world, this is only a partial picture of the reality, as more discerning research demonstrates. Not all of the rising aspirations fostered by exposure to the mass media are centered around material consumption. An important part of the seductive message that comes through listening/watching what passes for entertainment on radio and television undoubtedly propagates "modern" lifestyles—which include greater individualism, running a small and efficient home, having time for one's self, bringing up children who are healthy, wealthy and wise—all this, of course, in addition to increasing the yearning for more goods and more money to buy these goods as well as to buy these happy modern lifestyles. What the mass media do not seem to do a very good job of, unless it is through specific and usually internationally funded programs, to raise issues of gender equality and women's empowerment, is greatly disturb the social status quo. Indeed, by propagating the attractiveness of upper-class lifestyles, the mass media tend to, if anything, increase the allure of more conservative and constrained lifestyles for women.

A model of the impact of the mass media of the kind described above is consistent with theories of fertility decline that talk of the tradeoff between the quality of children and the quantity of children, the consciousness of which is an important part of the rising aspirations that promote a decline in fertility. But it also adds other competing forms of consumption to the growing satisfactions that higher-quality children provide as development proceeds. In other words, this development, whether measured by rising incomes, education, or accessibility to the mass media (but especially the last; as for how education falls in this category, I come to this shortly), increases the opportunity costs of children. The opportunities foregone by having several children now include:

—The opportunity to bring up better-fed, better-educated and better "able to cope with the modern world" children.

—The opportunity to do other things with maternal time. In the case of South Asia at least, this seems to be equivalent to having more time not for employment (there seems to be a clear negative relationship between education and employment, at least at the lower levels of education), but for the leisure that differentiates the upper class and caste housewife from her unluckier sisters. In addition, the mass media are clearly implicated in changed views about and attitudes to female attractiveness, sexuality and sensuality (see Faria & Potter, 1999), changes which increase the opportunity costs of high fertility.

—The opportunity to buy more "things."

As already mentioned, all these wants can coexist with continued gender inequalities within the household and low levels of female autonomy. Their generation requires a greater knowledge of the exciting alternatives to several "poor-quality" children, but this knowledge does not hinge on female autonomy and equality (the powerful role of the mass media, suggests that this knowledge is quite easily acquired without stepping out of the home, for example) and it does not threaten existing intrahousehold power relationships.

How is the impact of education on fertility analogous to that of exposure to the mass media? It is difficult to get a handle on this empirically because the data to do an analysis do not exist. Indeed, they do not exist partly because we are conditioned to see education a something positive and capable of having an effect only through positive or benign ways and there is not much benign or positive about overt consumerism in our collective judgements. With a good data set, one could look for possible relationships between education and consumerism in a more direct way. The most obvious analysis would involve identifying a relationship between education and the ownership of other consumer goods, after controlling for income. The only trouble is that most data sets use the ownership of consumer durables as a proxy for income because income is so notoriously difficult to measure in most poor societies.

Several kinds of indirect information suggest, however, that it is plausible that education leads to lowered fertility through the increased aspirations, especially material aspirations that it fosters. The most striking is the fact that education is about the strongest predictor of exposure to the mass media in many data sets (see, among others, Ramesh *et al.* (1996), for India; Westoff and Rodriguez (1995), for Africa); and if mass media exposure increases material aspirations, then so should education.

Macro-level information that suggests that fertility declines in general are correlated with rising material aspirations also imply that education is associated with rising aspirations if we accept that fertility declines at the macro-level are linked to rises in educational levels in a society (although this is a moot point; see, for example, United Nations, 1995). Rising aspirations are also suggested by the possibility that falling fertility, especially in parts of South Asia, seems to be associated with rises in dowry and associated decreases in the sex ratio of births (see, for example, Basu, 1999), and by the declines in fertility in otherwise disadvantaged Pakistan (see, Sathar & Casterline, 1998). As Freedman (1979) pointed out, the value of changing aspirations and increased consumerism to reduce fertility, independently of change in the objective circumstances of life, should not be underestimated.

The most interesting and provocative pointers are to be found in looking at differentials in the education-fertility link itself. Unlike the relationship between education and child mortality, which seems to be linear and monotonic across the developing world, the education-fertility relation exhibits many features that are consistent with the rising material aspirations hypothesis. Some of these features are, it is true, also consistent with a gender-equality hypothesis, but in this sense they only serve to reinforce the possibility that there are many routes to even an education-led fertility transition.

One of the interesting findings from cross-country analyses is that the fertility impact of individual schooling is generally weak in poor, rural and mostly illiterate societies and grows stronger in more prosperous societies (Diamond *et al.*, 1999; Jejeebhoy, 1995; United Nations, 1995). Indeed, in some of least developed countries, especially in sub-Saharan Africa, education is found to have a *positive* impact on fertility at lower levels of education. If one accepts that these societies are also the ones with the lowest access to material alternatives to children (including the opportunity to have fewer but higher-"quality" children), then one can see that educated women would not have fewer children than uneducated women even if the former experience significantly lower child loss (as they certainly do even at low levels of education and even in otherwise poor societies). In particular, these

are societies in which even educated women have very low levels of access to the mass media that are increasingly the source of much knowledge of the consumption possibilities on the outside world.

Most analyses of this curious finding are quick to point out that it is poor access to contraception that explains this anomaly, or that higher fertility is due to another supply-side factor—the increased fecundity of educated women. But I would suggest that this interpretation is based at least partly on our prior assumption that education cannot but lower fertility. Whereas in a framework in which one views children as an important form of parental consumption and happiness, one can see that lowered mortality could in principle even *raise* the demand for children because, by living longer, children are in a sense less expensive than before (Basu, 1994). That is, if one includes the expenditures on children that subsequently die in one's calculation of the costs of a living child, then such a child can be very expensive in a high-mortality situation. Moreover, the supply argument for the unchanged or higher fertility of women in these situations is considerably weakened by the simultaneous finding that in these societies even educated women have long breastfeeding durations, thus discounting one possible cause of an increase in fecundity.

The aspirations hypothesis gets some further support from the finding that fewer and fewer countries are exhibiting this fertility enhancing effect of education with time. According to the United Nations (1995), during the 1970s and early 1980s, this curvilinear relationship between education and fertility was found in 14 of 38 WFS countries examined (see United Nations, 1987), by the late 1980s and 1990s, it was found in only three of the 26 DHS countries analyzed (see also Muhuri, Blanc, & Rutstein, 1994). Once again, one may attribute some of this change to changing access to contraception; but it is also plausible that it represents, at least partly, an opening of the eyes to new opportunities for consumption—through knowledge of these new opportunities as well as through resources to avail of some of these opportunities.

In a much-cited paper, Blake (1968) argued against the thesis that babies are consumer durables. The main thrust of her argument was that if that had been the case, fertility would increase with income (indeed, Becker (1960), to whom Blake was responding had made the point that babies *were* consumer durables because fertility *did* rise with incomerpar. But the framework suggested here allows for children to be a kind of durable good and simultaneously allows for a drop in fertility with income (or, in this specific case, education) by treating "poor-quality" (that is, several) children as just one category of consumer durable, with competing consumer durables (in the form of fewer, more expensive children and other material and nonmaterial goods) reducing the demand for them as incomes, education, or knowledge increase. [8]

Newer evidence for this hypothesis arises from the experience of developed countries; it appears from this experience that as resources are no longer a serious constraint to material consumption, babies are indeed a consumer good in the Beckerian sense in that at the highest levels of education-fertility tends to rise (see, for example, Hoem & Hoem, 1997; Kravdal, 1990).

Where do gender considerations fit into this framework? Female autonomy and gender equality within the household and outside it make it easier for women to realize the new fertility goals they may acquire through rising education and consequently rising aspirations, if their households do not share these goals. But this is not really necessary, since the men that educated women marry are likely to share these aspirations because they are likely to be even more educated, or even more exposed to the mass media or to the outer world than their wives, and these shared material goals do not really threaten intrahousehold power relationships until much later in the game.

This paper suggests that an important determinant of intentional fertility decreases associated with female education may therefore be an increase in the family's or, more narrowly, the husband–wife team's *united* ability to manipulate the environment rather than an increase in such ability in the woman alone. Female education is partly a proxy for this joint ability since it is a proxy for the husband's characteristics that cannot be measured by his education (as I discussed in the last section). In addition, the wife's education is also a facilitator of this ability because there are now two individuals who can appreciate and reinforce each other's understanding that low fertility is one way to satisfy the new aspirations and wants which their education, among other things including the mass media of course, has spawned. In addition, female education allows

households as a whole to now better exploit the external environment of opportunities which open up because of education in the first place, an exploitation which often hinges on smaller family size.

For example, although an educated woman may not have much direct control over whether she grinds her spices on the grinding stone or in an electric grinder, her education and her exposure to the mass media tell her clearly that the electric grinder is much more convenient (and much more fun) and that one way in which her home can afford an electric grinder (even if she has no part in the decision to buy one) is if there is one less child for whom school fees have to be paid. If, in addition, she has fewer but more educated children, they can provide her with the television to watch in the time she saves with her electric grinder. But in India (and in South Asia in general) her education has also reinforced her calculation that to effect such transfers from children to parents, one needs sons not daughters, and with daughters in fact the transfers are all in the opposite direction. This kind of reasoning ability may explain why educated women want fewer children than uneducated women but are not much more indifferent than uneducated women to the sex composition of these fewer children. For example, in the all-India survey of the Operations Research Group (1991), only 1.5% of educated women were indifferent to the sex composition of their children, although the minimum number of sons wanted was, at 1.6, lower than it was for illiterate women at 2.0. The husband of this educated woman will, the last section suggests, already have similar low-fertility desires (except perhaps that the electric grinder is replaced in his imagination by a motorcycle).

Another important determinant is likely to be the hypothesized relation between parental education and children's education. If the mother's education increases the possibility of the daughters' education, then in families with educated wives, the overall proportion of children being educated is higher, thereby increasing the costs and decreasing the immediate benefits of children, another rationale for reduced fertility. In addition, if the literature on the impact of mass schooling on fertility has any basis (see, for example, Caldwell, 1980), then at the macro-level, too, there should be a fertility impact as larger proportions of children are sent to school—even if these larger proportions are merely a mechanical outcome of the greater probability that the daughters of educated mothers will be sent to school.

Rising material aspirations and greater investments in the education of daughters are but two of the ways in which the more ambitious partnership that characterizes the couple in which the wife is educated can provoke a fertility decline. There are other ways in which such couples and households may be receptive to the idea of fertility control. These include the differential impact of changes in the wider economy (couples with some education may be more likely to benefit from such changes with fewer children, or may even have more to lose with high fertility than do uneducated couples); access to modern views about family size in general; changing aspirations for one's children; the prestige of education being able to compensate for the loss of status associated with low fertility in uneducated families; the higher incomes which reduce the need for children as security; and the reduced fatalism about life in general and fertility control in particular which brings conscious birth control within the calculus of human choice. The important point is that many of these changes do not hinge on the ability of the educated wife to override the wishes of an ignorant or conservative husband—merely by marrying her, this husband has already demonstrated that he can be as "modern" as she is on these matters even if he continues to hold less modern views on matters of gender equality. The good thing is that although it is possible *in principle* therefore for gender inequality to be a continuing feature of the family with an educated wife, the empirical probability is that it is not a continuing feature in many parts of the world.

NOTES

1. The arguments are the most contentious on the role of national family planning programs in promoting such declines.

2. For example, there is some suggestion, from the trend in social welfare in the Scandinavian countries, that fertility may be rising slightly in these countries as

state policy increases the male responsibility for children and makes reduces the opportunity costs of women of childbearing.

3. Perhaps it is the *kind* of education that matters more for men than for women. A general measure such as years of schooling? may be able to discriminate much better between women than between men.

4. Female education also partly reflects resources and services. But the use of these resources and services is much more greatly conditioned by norms and values than is the case for males.

5. That some form of "modernization" or, more accurately, Westernization inspires the transition to lower fertility is now acknowledged in the literature to be as important as, and often more important than, changes in affordability occasioned simply by changing incomes. Indeed, even those changes in the costs and benefits of childbearing caused by changed incomes are usually mediated by changes in attitudes and aspirations. If this were not the case, increases in income would lead to a rise in the demand for children.

6. Alternatively, one could look at the education of their mothers. But in a society in which female education is a recent event, this might not be discriminatory enough. Moreover, the education of mothers may reflect the attitudes of the grandparents of the husbands more accurately than those of their parents.

7. For example, given the nature of existing data sets, one would only be able to look at the educational levels of sisters when the families are joint. In addition, one could only look at the education of the unmarried sisters of the husband, since his married sisters would be living elsewhere. But these problems may not exist in all data sets, and in any case, future research interested in exploring this question just needs to add a couple of questions to the standard household survey instrument to get rid of these potential biases.

8. But this is not at all to suggest that such material considerations explain the entire demand for children. If that were the case, as Blake points out, the very poor would have to remain childless. A kind of floor of wanted fertility is set by nonnegotiable factors such as culture, norms and religion; but above this floor, once can conceive of resources being having to be divided between more and more goods as knowledge of and access to these competing forms of consumption rise.

REFERENCES

Bankole, S. A. (1992). *Marital partners' reproductive attitudes and fertility among the Yoruba of Nigeria*. Mimeo, Ann Arbor: University of Michigan.

Basu, A. M. (1992). *Culture, the status of women and demographic behavior; illustrated with the case of India*. Oxford: Clarendon Press.

Basu, A. M. (1994). Maternal education, fertility and child mortality: can one disentangle some of the interrelationships in words? *Health transition review, 4*(2), 207–215.

Basu, A. M. (1999). Fertility decline and increasing gender imbalance in India: including a possible South Indian turnaround. *Development and Change, 30*(2), 237–263.

Becker, G. (1960). *A treatise on the family*. Cambridge, MA: Harvard University Press.

Blake, J. (1968). Are babies consumer durables? *Population Studies, 22*(1), 5–25.

Bozon, M. (1991). Marriage et mobilite sociale in France. *European Journal of Population, 7*(2), 171–190.

Caldwell, J. C. (1980). Mass education as a determinant of the timing of fertility decline. *Population and Development Review, 6*(3), 225–255.

Diamond, I., Newby, M., & Varle, S. (1999). Female education and fertility: Examining the evidence. In C. Bledsoe, & J. Casterline (Eds.), *Women's education and fertility in developing countries*. Washington, DC: National Academy Press.

Dyson, T., & Moore, M. (1983). On kinship structure, female autonomy and demographic behavior in India. *Population and Development Review, 9*(1), 35–60.

Ezeh, A. C. (1993). The influence of spouses over each other's contraceptive attitudes in Ghana. *Studies in Family Planning, 24*(3), 163–174.

Faria, V. E., & Potter, J. (1999). Television, telenovels, and fertility change in north-east Brazil. In R. Leete (Ed.), *Dynamics of values in fertility change* (pp. 252–272). Oxford: Clarendon.

Freedman, R. (1979). Theories of fertility decline: A reappraisal. *Social Forces, 58*(1), 3–15.

Hoem, B., & Hoem, J. M. (1997). *Fertility trends in Sweden up to 1996*. Stockholm Research Reports I Demography No. 123, Stockholm, Stockholm University.

Jeffery, R., & Basu, A. M. (Eds.) (1996). *Girls' schooling, women's autonomy and fertility change in South Asia*. New Delhi: Sage.

Jeffery, P., & Jeffery, R. (1993). Killing my heart's desire: Education and female autonomy in rural North India. In N. Kumar (Ed.), *Woman as subject*. Calcutta: Bhatkal and Sen.

Jejeebhoy, S. J. (1995). *Women's education, autonomy and reproductive behavior: experience from developing countries*. Oxford: Clarendon Press.

Kishor, S., & Parasuraman, S. (1998). *Mother's employment and infant and child mortality in India*. National Family Health Survey Subject Report No. 8, Mumbai, India, International Institute for Population Studies.

Kravdal, O. (1990). *Further reproduction among American and Norwegian two-child mothers: the influence of education, income and labor force participation*. NSFH Working paper no. 26, Oslo, NSFH.

Mason, K. O., & Taj, A. M. (1987). Difference between women's and men's reproductive goals in developing countries. *Population and Development Review, 13*(4), 541–561.

Morgan, S. P., & Niraula, B. (1995). Gender inequality and fertility in two Nepali villages. *Population and Development Review, 21*(3).

Muhuri, P. K., Blanc, A. K., & Rutstein, S. O. (1994). *Socioeconomic differentials in fertility*. Demographic and Health Surveys Comparative Studies, no. 13.

Operations Research Group (1991). *Family planning practices in India: third all India Survey: Vol. 2*. Baroda, India: ORG.

Ramesh, B. M., Gulati, S. C., & Retherford, R. (1996). *Contraceptive use in India 1992–93*. National Family Health Survey Subject Report No. 2, Mumbai, India, International Institute for Population Studies.

Sarkar, S. (1997). The city imagined: Calcutta of the nineteenth and early twentieth centuries. In *Writing social history*. New Delhi: Oxford University Press.

Sathar, Z. A. (1996). Women's schooling and autonomy as factors in fertility change in Pakistan; Some empirical evidence. In R. Jeffery, & A. M. Basu (Eds.), *Girls' schooling, woman's autonomy and fertility change in South Asia*. New Delhi: Sage.

Sathar, Z. A., & Casterline, J. B. (1998). The onset of fertility transition in Pakistan. *Population and Development Review, 24*(4), 773–796.

Stycos, J. M. (1996). *Men, couples and family planning: A retrospective look*. Working paper, Population and Development Program, Cornell University.

United Nations (1987). *Fertility behavior in the context of development: evidence from the world fertility survey*. New York: United Nations, Department of International Economic and Social Affairs.

United Nations (1995). *Women's education and fertility behavior: recent evidence from the demographic and health surveys*. New York: United nations, Population Division.

Vlassoff, C. (1996). Against the odds: The changing impact of schooling on female autonomy and fertility in an Indian village. In R. Jeffery, & A. M. Basu (Eds.), *Girls' schooling, women's autonomy and fertility change in South Asia*. New Delhi: Sage.

Westoff, C. F. (1999). Mass communication and fertility. In R. Leete (Ed.), *Dynamics of values in fertility change*. Oxford: Clarendon Press.

Westoff, C. F., & Bankole, A. (1999). *Mass media and reproductive behavior in Pakistan, India and Bangladesh*. Demographic and Health Surveys Analytical Reports No. 10, Macro International, Columbia, MD.

Westoff, C. F., & Rodriguez, G. (1995). The mass media and family planning in Kenya. *International Family Planning Perspectives, 21*(1), 26–31.