



RUDNAK

*Bright, well-educated
American women of all races are
having fewer children, a phenomenon the
author believes may affect national
productivity and the gene pool*

IQ AND FALLING BIRTH RATES

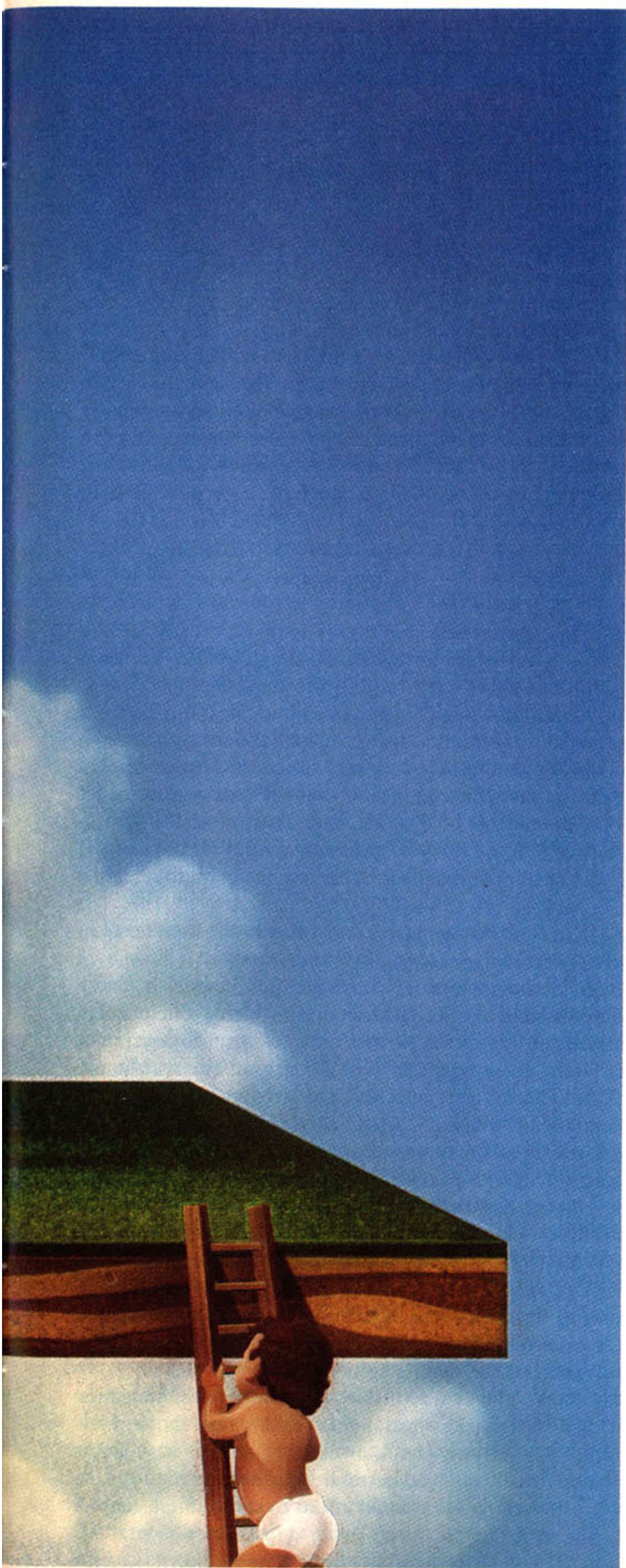
BY R. J. HERRNSTEIN

A GREAT MANY PEOPLE ARE ANXIOUS ABOUT HAVING children. I hear about this concern frequently from young men and women passing through Harvard—more than ever before in my three and a half decades here. And I hear about it in conversations with my peers, frustrated by the slow accumulation of grandchildren. This concern is at least mildly ironic, coming, as it does, two decades after alarms about a “population explosion.”

Though populations in South America and Africa and the Indian subcontinent continue to grow at an alarming rate, the U.S. media direct their attention increasingly to labor shortages in industrial societies and to shrinking school populations in affluent American suburbs. Thinking people have heard, and are talking, about the “birth dearth,” as Ben Wattenberg named it in the title of a recent book. Day-care and parental benefits, which will presumably increase the birth rate, earn approving mention in the platforms of both political parties and in glossy annual reports of large companies.

The concern about fertility also bubbles to the surface in artistic renderings of contemporary and future life—in light movies like *Baby Boom* and *Three Men and a Baby*, for example, about young women or men trying to reconcile careers and parenthood, and in serious novels, like Margaret Atwood's *Handmaid's Tale*, with its fantasy of a not-too-distant future in which the dwindling number of fertile women are made slaves to procreation.

Low fertility, of course, is hardly a new worry. Some of its history, especially that in Europe since the middle of the nineteenth century, is well and compactly told by Michael Teitelbaum and Jay Winter in their book *The Fear of Population Decline*. Some French writers attributed the defeat of their nation in the Franco-Prussian War, in 1871, to the slow French rate of reproduction, as compared with that of fecund Germany. Fertility became a central issue



in early-twentieth-century French politics. Besides being blamed for France's inability to field an army large enough to defeat the Germans and also have a functioning economy at home, low fertility was seen by various contemporary French commentators as the cause or the effect of "national degeneracy," a disease of the French spirit.

Fiction echoed reality, as it does everywhere. In Emile Zola's novel *Fecondité*, written at the turn of the century, happiness and personal triumph came to a working-class couple with fifteen children and scores of grandchildren, rather than to various unappealing bourgeois, with their selfishly hedonistic but ultimately miserable lives, their Malthusian rhetoric bemoaning fecundity, and, above all, their small families. Zola was one of the founding members of the National Alliance for the Growth of the French Population.

In Great Britain, too, arguments about reproduction were part of the political landscape before and after the turn of the century. As in France, a disastrous and costly war heightened public alarm. But the British had been outfought in southern Africa, rather than outnumbered, by the Boers, even though the British eventually won the war. Considerations of the losses of the Boer War emphasized not so much the question of *how many* British soldiers but of *how good* they were. If the French worry about fertility was characterized as mainly quantitative, the British worry was mainly qualitative.

The worries went beyond the quantity and quality of armies. Teitelbaum and Winter describe a British preoccupation with the general "physical deterioration" of the population; with what was called the residuum, meaning urban unskilled workers; and with the "proliferation of the unfit" versus the underreproduction of the fit. Prime Minister Arthur Balfour worried publicly in 1905 that the very members of the working class who showed the enterprise and ability to improve their lot were the ones who limited their own fertility, while those who did not get ahead bred beyond their capacity for taking good care of their children. "Everything done towards opening up careers to the lower classes did something towards the degeneration of the race," he said.

In our time, Prime Minister Lee Kuan Yew, of Singapore, has said, "Levels of competence will decline, our economy will falter, our administration will suffer, and society will decline" because so many educated men are failing to find educated women to marry and are instead marrying uneducated women or remaining unmarried. But Lee is an exception, for few modern political leaders dare to talk in public about the qualitative aspect of low fertility. We know why this is, and it has less to do with whether or not we have a fertility problem than with the unacceptability of talking about the subject. In our century the Nazis made selective fertility an emblem of National Socialism, with malevolent consequences that need no review here. Hence even to mention fertility in relation to nation or race has become taboo.

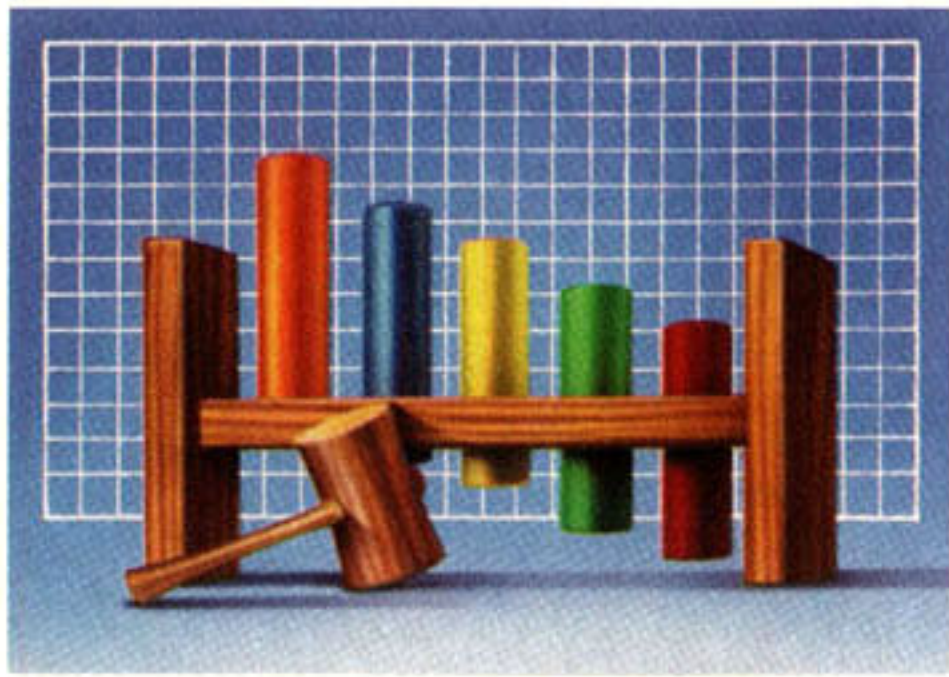
Nonetheless, human fertility, particularly in its qualitative aspect, has a special and direct relation to economic productivity. A full study of fertility and productivity would, of course, cross many frontiers of scholarship, but my focus is narrower. My subject is differences among groups within the population: how these differences affect fertility and how that, in the long run, may affect the society's economic well-being. Partly because of our ghastly memories of the Nazis, many social theorists and scientists have for some time been reluctant to take such differences into account. Society, these social scientists say, must be studied at the level of broad social forces, not at the level of small subpopulations. But however useful and illuminating the abstractions of social theory are, the actual life of a society must consist of myriad individual human actions. In the present instance the social consequences of reproduction are illuminated by the study of individual differences, and the light it sheds spreads further than many realize.

Population

IN PREINDUSTRIAL SOCIETIES PEOPLE TYPICALLY DIE and have babies at high rates, the difference between the two rates determining the direction and size of population growth (if we set aside complications like migration and age at reproduction). With the advent of industrialization, mortality rates fall. Since birth rates remain high, the first consequence of industrialization is a rise in population. This is what alarmed Thomas Malthus, who wrote at the end of the eighteenth century to warn of the tendency of populations to expand to the point of marginal subsistence.

Malthus could not have known that in the next stage of this process of demographic transition, as it is known among demographers, the birth rate falls, largely or totally compensating for the fall in mortality rates. The average number of live births per American woman, for example, fell from about eight in the 1700s to about two in the 1970s. The timing and size of the two components of the demographic transition—the fall in death rates and the fall in birth rates—may vary from nation to nation, but the transition itself is as close to a demographic universal as social science has discovered.

This purely quantitative aspect of the transition is quite well known, unlike the qualitative aspect, which may in the long run be no less significant socially. Robert Retherford, of the East-West Population Institute, in Honolulu, has examined dozens of empirical studies, from many countries, of the demographic transition in relation to social status. The evidence shows that prior to the transition women of high status had higher fertility than those of low status. Among the possible reasons for this: high-status women usually enjoyed better health, they married earlier, because their spouses could afford to start families earlier in life, and they endured fewer and shorter separations from their spouses than low-status women did.



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After the transition the overall birth rate is lower, but now women of high status usually have lower fertility than those of low status. Health and marital separation cease to be major factors in fertility, and because of the educational opportunities open to women of high status or high intelligence, their age at marriage rises above that for women who, for whatever reason, lack those opportunities. More-subtle changes, involving the social relation between men and women, may further depress fertility, especially at the upper end of the social and intellectual range.

With only rare exceptions, according to the evidence that Retherford has assembled, the fall in fertility during the transition is thus not just a fall but also a redistribution. At first glance the demographic transition seems biologically perverse. Why do people limit their fertility just when improved conditions of life—as reflected in the reduced mortality rate—might allow them to raise more children successfully? And why should more limitation of fertility take place at high social-status levels than at low? Theorists have several hypotheses.

Economic theorists have noted a simple economic fact about industrialization, one that may influence people's decisions about family size. Economic resources flow from children to parents before industrialization, and vice versa afterward. Another pair of hands on the farm is transformed, after the demographic transition, into another mouth to feed or another tuition to pay. Industrialization and modernization may tip the economic balance toward small families, and do so at higher social-status levels more than at lower, if people calculate consequences at all rationally, as economists usually assume they do.

Theorists with a more biological orientation have suggested that after industrialization people may focus more on the quality of offspring than on the quantity. A few well-nurtured children may have been, at some point in our evolutionary history, a better long-term strategy for the survival of parental genes than many children at the brink of extinction. This means that those who have fewer children may, theoretically, have more grandchildren who reach reproductive age. Biologists theorize that from the evolutionary pressures of such an era, if it existed, we may have inherited behavioral dispositions that favor lower birth rates as conditions improve on the average—as they do in the transition to an industrialized society for those

who succeed in that society. Whether or not the reduced birth rate after industrialization is justified rationally is beside the point as far as this theory is concerned, for the inherited traits of an era arise from the selective processes of an earlier era.

Another biological approach to the demographic transition looks at the differing pressures of parenthood on women and men. Females and males inevitably have different investments in offspring. Mothering is more depleting than fathering. For example, the number of ova per woman is quite limited, compared with the virtually unlimited number of sperm per man. A woman can have little more than one pregnancy a year; a man has no such limitation on his reproductive rate. Each of a woman's children represents a greater fraction of her reproductive potential than does each of a man's. Because she invests more in each child, she is more vulnerable biologically, and perhaps psychologically, to anything that threatens an offspring. Because of this special vulnerability, the customary sexual division of labor—whether or not its origins are inherited—places on mothers a disproportionate share of the burdens of child-rearing.

One difference between human beings and their close biological relatives is that human intelligence has made salient the different stakes that women and men have in parenthood. As human intelligence evolved, women came to understand more clearly than their simian ancestors the risks, pains, and obligations of motherhood, and how these contrasted with the consequences of fatherhood. Women should therefore have come to prefer smaller numbers of children, and they have. They may want the first child or two as much as or more than their spouses do, but in the aggregate women in most societies who express a preference for a particular family size prefer small families, and in few societies do they prefer large ones. Further, women who express a preference—suggesting that they feel they have a say in family size—tend to have fewer children than those who, fatalistically, do not express any preference at all.

No species can survive in the long run, however, if its female fertility falls below what demographers call the replacement rate: the number of children an average woman must have in order to maintain a constant number of women from generation to generation. Since our species continues to flourish, the tendency toward childlessness

must, therefore, have been counteracted by evolution and by culture, during the hundreds of thousands of years since the dawning of human intelligence.

One theory defended by a number of contemporary researchers holds that birth rates drop when a society modernizes if one of the corollary effects is to free women to any extent from the cultural pressures forcing them toward motherhood or keeping them subservient to men. If, for example, they become less dependent on or less threatened by men, and more free to choose a style of life, they will, if the theory is right, choose fewer children. They can just say no.

Inexpensive contraception should hasten the decrease in fertility as women are liberated, by separating the rewards of sexual activity from the costs of parenthood. Contemporary women may choose sex and reject motherhood, an option unavailable to women sexually oppressed and without access to birth control. The calls for the right to abortion come largely from these contemporary women.

This theory implies a differential fall in fertility within a society. The number of offspring may decrease most among more-intelligent women, since they are most aware of the costs of motherhood, all of which are deferred from the moment of fertilization. Sex comes first, the pains and costs of pregnancy and motherhood later. Much research suggests that the less intelligent people are, the less they are likely, on the average, to be influenced by the delayed consequences of their behavior. Women from the higher social strata—and more-intelligent women—are also likely to have fewer children because they are more likely to find rewarding occupations other than, and competing with, motherhood. Societies that manage to keep women subjugated while industrializing should, according to this theory, avoid or reduce the qualitative effect of the demographic transition. Their women—especially their advantaged women—should have more children relative to the historical norms of their society than comparable women in other industrialized societies.

While all these theories about the falling birth rates of the demographic transition are probably right to some extent, the exceptions to the general pattern are well explained by taking sex-role differences into account. The relevance of women's rights to the demographic transition is exemplified by the experience of Japan. Daniel Vining, a demographer, has summarized the evidence showing that educated, upper-class Japanese women did not bear fewer children than women lower on the social ladder as their country grew industrially after the Second World War, and they also did not enjoy as much cultural and economic liberation as did women in modern societies elsewhere. Japan seems to have passed through the quantitative aspect of the transition without experiencing much of the qualitative, reducing fertility rates more or less uniformly all along the social scale. In the Muslim nations as well, childbearing has not shifted disproportionately to women of lower strata, and in that culture, too, women have by Western standards remained oppressed.

WE MIGHT BE CONCERNED ABOUT THE REDISTRIBUTION of childbearing toward lower social strata for many reasons, among them the correlation between social status and socially important traits. Intelligence, as measured by intelligence tests, is one such trait. Because parents and children tend to have comparable levels of measurable intelligence, the average intelligence of the population will decline across generations to the extent that reproduction shifts toward the lower end of the scale (assuming no other influence on the average level). This decline does not depend only on the genetic factor in intelligence, even though most contemporary researchers say that the genetic factor is large. Differential reproduction shifts a population toward the characteristics of the more prolific parents for all traits in which parents and children resemble each other, for whatever reason.

Are brighter women, in fact, having fewer children than less bright women in the United States? Except for the time of the (atypical) Baby Boom, fertility and tested intelligence have been negatively related in several national samples of Americans. The best, albeit still tentative, estimates imply about a one-point drop per generation over the population as a whole, other things being equal. The decline would be larger in the black population than in the white, because black women show a steeper fertility differential in relation to IQ. Using historical estimates of overall American birth rates, Vining tentatively infers the equivalent of a four-to-five-point drop in IQ over the five or six generations spanning the demographic transition in the United States, with only the Baby Boom generation's IQ not dropping. This may not seem like much, but the drop is large if we consider the "tails" of the distribution of intelligence and not just its average. For example, a five-point drop in the average, if the distribution of scores has the "normal" (that is, the familiar bell-curve) shape, would result in almost a 60 percent reduction in the fraction of the population with IQ scores over 130 and a comparable increase in the fraction with IQ scores below 70. It may be the tails of the distribution, more than the average, that we should be worrying about.

The Japanese population has a higher average IQ than the American. In public discussion this IQ differential is usually attributed to the superiority of Japanese schools, but the difference is already present in the earliest years of primary school, and has grown in recent generations. The superior IQ scores of the Japanese population may be to some extent yet another consequence of the demographic transition, which, as noted above, has had less of a differential effect within Japan than it has had here.

Productivity

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whatever small cost we are paying in lost intellectual ability? That is certainly a possibility, but most people who express that hopeful notion underestimate the cost we pay, economically and perhaps otherwise as well, for lost IQ points.

As a rule of thumb, more-educated people in a modern society are more intelligent, as measured by standard tests, and vice versa—chiefly because societies usually invest educational resources in the people who make the best use of them, and that usually means the people with the high scores. Whether or not one approves of it, education and intelligence are thus correlated—but they are not identical. They can be pulled apart, at least a bit, as a matter of public policy. During the Cultural Revolution in China a centuries-old Chinese tradition of educational selection by objective tests was for a time abandoned. Closer to home, judges and legislatures in this country have been regulating or banning the use of objective tests for school placement and university admissions.

Occupational success in modern societies is linked to education. For decades study after study has shown that people who do well in school are more likely also to do well socioeconomically. Therefore, one line of reasoning goes, the key to productivity and individual achievement is education—rather than individual traits that predict educational success.

If that reasoning were sound, we would be in increasingly excellent shape, compared with the rest of the world. The United States has decisively left the competition behind in sending its population to school. From 1900 to the present the proportion of the American population completing high school rose from 10 percent to over 70 percent. In the 1970s about half of all high school graduates went to college. In the Soviet Union, in contrast, about 10 percent of all high school graduates (who are a smaller fraction of the population to begin with than are graduates in the United States) went on to the next level of education. Western European countries and Japan also fall short of the American standard, graduating fewer than 70 percent (in Italy, the Netherlands, and West Germany the number is fewer than 20 percent) of their high school students, and admitting far fewer of those graduates to college. Similarly, American schoolteachers have, on the average, more years of post-secondary education than teachers anywhere else.

Sending more people to school has no doubt produced benefits in the quality of American life, but instead of an educated populace, we find widespread illiteracy and its mathematical equivalent, innumeracy. Many Americans are going to school more but, apparently, learning less. Schools are being criticized for their lack of rigor, for failing to instill a love of learning; society as a whole is criticized for underpaying and underappreciating teachers. These criticisms may in time lead to improvement. For the present, however, the fact is that the expansion of schooling has not done the job we expected it to do, and its disappointments are evident not just in the classroom. While America has been sending more people to school, it has also been losing ground in the growth of worker productivity, compared with nations having less-schooled populations, such as Japan and West Germany. We now know, to our regret, that something more fundamental than schooling per se explains the historical role of education as a ladder to economic success.

Thanks to a remarkable series of studies by applied psychologists, especially John Hunter, Frank Schmidt, and their associates, we know quite a lot about the predictors of individual occupational success in the United States. Overturning the conventional wisdom of several generations of experts, their analyses prove that variations in intelligence, as measured by IQ and IQ-like tests (such as the U.S. Employment Service's General Abilities Test Battery), predict job productivity to an extraordinary degree.

Because job performance is correlated with intelligence, we now know not only that the productivity of the American work force as a whole, and within particular occupations in given locations, can be improved by the use of intelligence tests for job placement, but also how much improvement is possible. For example, one analysis estimated that Philadelphia would lose \$170 million in productivity over a ten-year period by not using an intelligence test when hiring recruits for the police department. Losses that are larger per person hired would be incurred by failing to test applicants for jobs demanding greater cognitive complexity, such as computer programming. For the American work force as a whole, after taking into account the number of people at all levels of intelligence, the productivity differential between a labor force selected by intelligence tests and one selected at random from ap-

plicant pools was estimated to be worth a minimum of \$80 billion in 1980—about the size of the total annual corporate profit for the Fortune 500 in that year.

When these new analytic methods are applied to thousands of separate studies of worker performance in relation to intelligence, certain broad generalizations follow. Intelligence tests predict performance (as measured by on-the-job trainability, objective measures of job proficiency, or supervisor ratings) in hundreds of common occupations. Performance in a job requiring greater cognitive complexity, such as the job of manager, is more strongly associated with intelligence than performance in one requiring less, such as that of sales clerk. But even for a job at the lowest level of cognitive complexity, such as off-loading conveyor belts, intelligence has predictive power.

The predictive validity of intelligence-test scores, expressed as a correlation coefficient between the score and some measure of job performance, seems to vary from about 0.2 to about 0.6 for individual occupations, and to average about 0.5 for the work force as a whole. If this finding holds up, it is an astonishing result. It says that on the average about 25 percent of the variation in worker productivity can be accounted for by the scores on intelligence tests that can be administered in an hour or so.

Performance in occupations demanding little cognitive complexity is usually best predicted by scores on tests of psychomotor skills (eye-hand coordination, simple reaction time, and so forth), rather than on tests of intellectual ability. Therefore the use, for hiring and promotion, of some combination of intelligence and psychomotor scores, suitably weighted for particular occupations, would predict job productivity even better than the use of either or, obviously, the use of neither, which seems to be a fond hope of advocates of various causes.

One study compared intelligence-test scores with ten other plausible predictors of productivity (job tryout, biographical inventory, reference check, experience, interview, training and experience ratings, academic achievement, education, interest, and age) of entry-level employees in a variety of occupations. All the variables except age had some predictive validity, but intelligence scores, with a validity coefficient of 0.53, had the most. Near the bottom, with coefficients of 0.11 and 0.10, were academic achievement and education, respectively. For employees already on a job, intelligence scores predicted performance after promotion as well as, or better than, measures based on past performance.

Educational level may be a better predictor than intelligence of occupational *attainment* in the United States, as many studies have shown, but for occupational *performance*, intelligence is the better predictor by far. Employers may use educational credentials to hire or promote their employees because they do not understand the power of, do not have available, or are simply reluctant to use measures of intelligence. But the failure to use intelligence measures seems costly in terms of productivity. The

evidence also shows that the distribution of intelligence matters in its own right, and not just in relation to the effect of intelligence on success in school.

WHAT ARE THE IMPLICATIONS? FIRST, AT THIS POINT in our history merely sending more people to school for more years seems to offer little benefit to economic performance, although doing so may be worthwhile for other reasons. At one time schooling was largely reserved for socioeconomically privileged people. Opening the schools to the rest of the population harvested a vast benefit, intellectually and economically, but we seem to have passed the point at which a large economic gain can be made by merely increasing access to schooling.

The data suggest, however, that schools could be improved so as to develop the very intellectual skills that are so predictive of productivity, and perhaps to further other social purposes. Even the most confirmed believer in the genetic factor in intelligence knows that the environment contributes significantly. Most such believers would probably also agree that schools can play a major role in developing intelligence. For schools to do so would take new knowledge about cognitive development and a redirection of how they go about their business. What is needed, in short, is more support for research on intellectual variation and development, and less political restraint on engaging in it and then applying its findings.

Second, we should be conscious of how public policy interacts not just with education but also with other influences on the intellectual quality of the population, such as the differential in the fertility rates of women of different intelligence. Many things may be done short of the horrors of *The Handmaid's Tale*. Nothing is more private than the decision to bear children, yet society has a vital interest in the aggregate effects of those decisions. This issue demands informed public consideration, and probably also public action to lessen the tension between parenthood and career. At the very least, we should stop telling bright young women that they make poor use of their lives by bearing and raising children, as commencement speakers and others have implied to educated women for decades.

The competing ideals of equality and efficiency create a dilemma of long standing. For various reasons, the dilemma is keenly felt in America. The goal of efficient production competes with the goal of a more equal distribution of wealth. We can, we believe, gain greater equality with little or no cost in productive efficiency, especially by investing more in education. But the data now tell us that economic efficiency depends on still intractable individual characteristics, given current methods of education. The individual characteristics run in families for reasons not easily overridden by social policy. Whatever else we may want to infer from that fact, we ought to bear in mind that in not too many generations differential fertility could swamp the effects of anything else we may do about our economic standing in the world. □