

THE CHRONICLE OF HIGHER EDUCATION

The Chronicle Review

March 16, 2015

Do You Need More Children?

By David P. Barash

"I hate and detest that animal called man," wrote Jonathan Swift in a 1725 letter to Alexander Pope, "although I heartily love John, Peter, Thomas, and so forth." Dean Swift might have been speaking — up to a point — for me. I find *Homo* allegedly *sapiens* much less lovable in the aggregate than I do as individuals. What I "hate and detest" is the all-too-human penchant for destroying one another and the rest of the natural world.

One needn't be a manifold misanthrope to see that our planet simply cannot accommodate an indefinitely rising human population, or indeed, indefinitely increasing numbers of any organism. If fruit flies, which can produce 25 generations a year, were to reproduce without restraint, they would generate a solid ball of *Drosophila* 96 million miles in diameter — after just one year! Darwin made a similar calculation for a much larger but more slowly reproducing creature, elephants, with similar results after a few centuries. Good planets are hard to find, and ours is finite, as is the capacity of technological *dei ex machina* to rescue it ... and us.

Amid the gloom about our demographic situation, however, there is at least one hope-inducing pattern, so consistent as to be perhaps the nearest thing that demography has to a fact: the so-called demographic transition. This is the observation that when socioeconomic conditions improve and societies modernize (notably including higher and more widely shared education levels, medical care, and improved status for women so that their perceived value is no longer determined primarily by their

fecundity), the intervals between births increase, along with the age of women at the time of their first child. Over all, birth rates decline. Sometimes they even plummet. All without any direct anti-natalist government intervention.

It appears that the demographic transition is what anthropologists call a "cross-cultural universal," a predictable consequence of human nature under certain circumstances.

Some examples: The overall fertility rate in India fell significantly, despite the loosening of Prime Minister Indira Gandhi's draconian population policy, from 3.6 in 1991 to 2.3 in 2013. Nevertheless, a substantial urban-rural divide remains, with village women having a fertility rate of 2.5 children, compared with urban residents' 1.8.

According to [estimates](#) from the CIA's *World Factbook*, the half-dozen countries with the highest fertility rates (the average number of births per woman in the population) were, in order: Niger, Mali, Burundi, Somalia, Uganda, and Burkina Faso, with numbers running from 6.89 to 5.93. At the opposite end, Singapore had the lowest total fertility rate (0.80), preceded by Macau, Taiwan, Hong Kong, South Korea, and the British Virgin Islands (1.25). The United States was 123rd (2.01), among the total of 224 countries, roughly between Ireland (2.00) and New Zealand (2.05). Get the picture?

Further evidence comes from the United Nations "Human Development Report" for 2013, which makes use of a Human Development Index for each country, a composite statistic originally created by the economists Amartya Sen and Mahbub ul Haq, which combines data for income, education level, and life expectancy. Dividing countries into four groups with regard to their human development — very high, high, medium, and low — [the report](#) shows a striking inverse relationship with fertility rates: The greater the human development, the lower the fertility rate.

Most of the developed, industrialized world is close to zero population growth, while Africa and parts of the Islamic world retain the highest birth rates. In nonindustrial, rural societies experiencing the first stage of this demographic process, both birth rates and death rates tend to be high, and the population therefore remains relatively stable. Then, with public-health measures like immunizations, widespread food distribution, and so on, death rates decline while birth rates remain high, and the population increases.

But in the final stage of the demographic transition, improving social and economic conditions, along with lowered infant mortality, produce a desire for smaller families, as parents realize that they do not need large numbers of children to serve as field hands, compensate for those they might lose, or provide security in their old age. Moreover, parents recognize that to endow their children with benefits like a higher education, they must have fewer of them. As a result, populations eventually level off.

It is difficult to make a cogent case that more people are needed, anywhere in the world.

I'd like to emphasize that in pointing out the high birth rates in developing countries, compared with the low rates in developed ones, I am not saying that "they" need to control their numbers more than "we" do; therein lies not only racism but also a deep misreading of reality. Given that the United States, with 5 percent of the world's population, consumes roughly 24 percent (and it may be more) of the world's resources and contributes at least that much of the world's pollution load, there is every reason to think that in terms of the burden placed on the planetary ecosystem, Americans have, if anything, a greater responsibility to control their numbers than do, for example, Bangladeshis, who do far less damage per capita.

At the same time, the costs of overpopulation weigh more heavily

on the inhabitants of less-developed nations. Uncontrolled population growth in subsistence economies threatens not only their environment but also their social and economic capacities. Universal public education becomes virtually impossible when school systems are swamped with youngsters; ditto for medical care. When population is constant or slightly declining (as in Germany, Japan, or Switzerland), a small increase in economic growth, say 2 percent, results in increased prosperity; when the population increases by 3 or 4 percent, that same 2-percent economic growth results in painfully declining living standards, since more people must compete for the resources.

It is difficult to make a cogent case that more people are needed, anywhere in the world. Deserts, steep or high mountain slopes, or low-lying marshland that is regularly inundated by floods cannot and should not be densely occupied. The planet does not contain any more Shangri-Las: unpopulated regions that could provide idyllic, well-balanced lives for substantial numbers of people.

On the other hand, overpopulation can easily be exaggerated as a cause of human misery. Some of the most impoverished regions in the world—Sudan or Chad in Africa, or northeastern Brazil—are among the most sparsely inhabited. The poverty of much of Egypt, Ghana, and Indonesia is sometimes blamed on their high birthrates and population density, yet those countries have fewer people per square mile than England, Wales, Japan, Holland, Belgium or Germany, among others. There is nothing simple when it comes to human population.

Nor is the demographic transition simple. In some ways, it is counterintuitive, especially from a Darwinian perspective. We might expect that healthier, wealthier people would transfer their bounty into more children because offspring constitute the evolutionary bottom line for all living creatures. But that is where things get especially interesting.

An important principle of behavioral ecology and population biology — little noted among demographers — involves a distinction between "*r*-selection" and "*K*-selection." As befits many phenomena in science, along with so many other endeavors, the popularity of this distinction has experienced something of a pendulum effect. After initially receiving considerable attention, it is no longer the cornerstone it once was. Nevertheless, the concept of *r*- and *K*-selection remains a useful way of conceptualizing and summarizing important patterns in ecology and population science.

Neither *r*- nor *K*-selection is an absolute, but rather each is an end point along a continuum describing how natural selection operates to produce life strategies in different species. Each describes a suite of traits, which make sense in terms of the circumstances under which their evolution has been taking place. Thus a species experiences an *r*-selection when evolution favors rapid reproduction, giving rise to many offspring, but necessarily curtailing the amount of parental investment available to each one.

Common house mice, for example, are *r*-selected, capable of producing litters of a dozen or more pups at a time. Females are sexually mature at six weeks of age, at which time their gestation period is about 20 days. Female African savannah elephants, by contrast, are *K*-selected: They give birth to only one offspring per pregnancy, don't usually begin to reproduce until age 14, and have a gestation period of around 22 months. A female house mouse can breed five to 10 times in a year, whereas her elephant cousin will typically wait five years before ponderously producing one calf once again.

What's the best way to reproduce? By the dozens and in a big hurry, like a mouse? Or slowly and one at a time, like an elephant?

If you have regular opportunities to reproduce rapidly and to

quickly fill a more or less open niche, *r*-selection is your ticket; think of how mouse populations can explode when the opportunity arises. On the other hand, if there is greater competition among individuals, hence less payoff to breeding rapidly and more benefit to being better endowed, developing gradually, learning from your wise elders, being protected by them, and enjoying a longer life span, then *K*-selection is generally favored.

We do all sorts of things that demonstrate foresight, like storing seeds and contributing to a 529 account.

The "*r*" in *r*-selection comes from the population biologist's symbol for natural rate of population increase. It is especially relevant to creatures for whom the greatest payoff derives from breeding rapidly: essentially live fast, love hard, and die young; such animals, like mice, tend to be small-bodied. The *K* in *K*-selection comes from the ecological symbol for carrying capacity ("capacity" in German is *Kapazität*), based on the observation that a *K*-strategy is most likely among organisms that are living at or near the ecological limits for the populations; such animals, like elephants, grow and reproduce slowly and are typically large-bodied. This can be summarized as *r*-selection favors quantity while *K*-selection focuses on quality.

In the standard mathematics of population biology, populations increase in proportion to their size and their intrinsic reproductive rate (*r*). Inversely, the rate of population increase slows down as the population reaches its carrying capacity. There are exceptions, however, to the *r*- and *K*-predictions: For example, elm trees are large-bodied, slow-growing, and potentially long-lived, yet they produce millions of seeds. And mice — *r*-selected as mammals go — are *K*-selected compared with oysters. And people? Pretty much *K*-selected, although generally exceeded in that regard by Dumbo

and his relatives.

I would suggest that the demographic transition reflects a transition from a predominantly *r*-strategy to a *K*-strategy. Does that mean that what demographers tell us is happening in human societies — the demographic transition — is literally the same process that biologists describe in other organisms? Clearly there is a convergence here. But is it based on shared evolutionary pressures and manifested by comparable genetically encoded tendencies, or is it a notable coincidence? Frankly, I don't know.

Natural selection has placed different species in different locations of the *r*- and *K*- continua, and as far as we can tell, most of them are severely limited in their ability to make adjustments, even when conditions change, and especially if they change a lot. That is because evolution, in itself, doesn't have any foresight. But — and here is the key — natural selection can, at least on occasion, create organisms that do possess foresight, or at least the ability to assess circumstances and respond accordingly: for example, us. A mouse cannot suddenly change its reproductive biology in response to new circumstances. It can no more become a *K*-selected pachyderm overnight than an elephant can instantly become an *r*-selected rodent. People, too, can't (at least not yet!) fundamentally redesign their anatomy or physiology. But they can adjust their reproductive behavior, recognizing that when it's time to focus on quality rather than quantity, it's appropriate to have fewer children and invest more in each one.

We do all sorts of things that demonstrate foresight, like storing and then planting seeds that won't germinate until the next season, or contributing to a child's college-tuition account. On the other hand, when it comes to some of the most important situations in which foresight appears especially needed — to intervene in our current path toward global climate disaster, counter reductions in biodiversity, take bold steps toward eliminating the risk of nuclear war — our species has been

woefully shortsighted. Will we have enough foresight to understand where we fit in the continuum of demographic change?

Predictions about human population are notoriously inaccurate, so that perhaps the most reliable prognostication is that any prognostication will probably be wrong. There are, however, a few reliable projections, such as that the planet's population will keep growing, for better or worse, at least for a while. Another is that although sheer human numbers will increase, there is reason to think (and for many of us, to hope as well) that at least the rate of such increase will begin to slow down, and to predict that whatever the mechanism, the demographic transition may well be largely responsible for this much-needed change.

David P. Barash is an evolutionary biologist and a professor of psychology at the University of Washington. His most recent book is Buddhist Biology: Ancient Eastern Wisdom Meets Modern Western Science (Oxford University Press, 2014).

14 Comments

The Chronicle of Higher Education

 Login ▾ Recommend Share

Sort by Oldest ▾



Join the discussion...

22081781 • 8 days ago

"Given that the United States, with 5 percent of the world's population, consumes roughly 24 percent (and it may be more) of the world's resources and contributes at least that much of the world's pollution load,... Americans have, if anything, a greater responsibility to control their numbers than do, for example, Bangladeshis, who do far less damage per capita."

Thank you for saying this.

8  |  • Reply • Share ›

lucapacioli → 22081781 • 7 days ago

"...consumes roughly 24 percent...." The U.S. produces roughly 27% of the world's GDP. Clearly the U.S. adding value to the inputs.

3  |  • Reply • Share ›

rightwingprofessor → 22081781 • 6 days ago

I am quite suspicious of the statement that the US contributes "at least that much of the world's pollution load." It doesn't pass the smell test.

 |  • Reply • Share ›

22178056 • 8 days ago

Remember the 'Zero Population Growth' movement that was so popular back in the 60s and 70s? Whatever happened to that kind of thinking? When I look around at my contemporaries who came of age during that period, hardly any of us have kids. We got the message. The world has finite resources and can only accommodate so many people. This is not rocket science, it's simple common sense. When there are so many orphaned kids in the world, why are people so insistent on making more babies? We need to bring back the ZPG campaign.

8 ^ | v • Reply • Share ›

11286747 → 22178056 • 8 days ago

Have been mystified by this myself. Having been part of the ZPG conversations in the 60s and 70s, virtually none of the families in my age cohort/friend group have more than two kids for all the reasons outlined in Barash's article. Many of the young, middle-class families around us today, on the other hand, have at least 3-4 kids. This decision to have large families seems to be disconnected both from a discussion of the issues Barash raises, and the dramatic increase in the cost of college. I hear young(er) families express deep worry about the upcoming cost of sending their kids to college--while having more babies. What happened? Can someone explain this to me?

^ | v • Reply • Share ›

jinxlou → 11286747 • 8 days ago

You're seeing what you want to see. Younger families are not having more children although, if what you are seeing is real (and I doubt it), this might be geographically confined to your region.

^ | v • Reply • Share ›

Gopher63 → jinxlou • 7 days ago

There are also religious factors and not just Roman Catholics.

^ | v • Reply • Share ›

22251848 → 22178056 • a day ago

One reason is that there are multiple barriers to adoption, both foreign and domestic. Not everyone is equipped to deal with adoptive children who may have special needs.

^ | v • Reply • Share ›

Charlie • 8 days ago

Unfortunately, at least until recently, when "socioeconomic conditions improve and societies modernize (notably including higher and more widely shared education levels, medical care, and improved status for women so that their perceived value is no longer determined primarily by their fecundity," the society's impact on the environment increases.

1 ^ | v • Reply • Share ›

dykino • 8 days ago

Funny the article did not include the United Nation's prediction of population for the next several hundred years. It stated that the population will rise from about 7 billion to between 9 and 10 billion in 2050. However, almost all that rise will center in Africa with many countries in Europe, the Americas and Asia actually starting to lose population. However, certain countries in Eastern

Europe and particularly Russia are dramatically losing population even today. Vladimir Putin stated in a speech that Russia faces a demographic disaster when you consider it is losing about 650,000 persons a year and a majority of its male population are problem drinkers and many die early deaths from accidents and alcoholism. A guest of a Bill Moyers' PBS broadcast made the remarkable statement that the average Russian woman averaged 5 abortions (I find that hard to believe). The problems of Japan of an aging and declining population are acute too as it is well reported. From 2050 to 2300 the population of the whole earth is expected to decline precipitously. Some are calling it the future "demographic winter." The 2.1 birth rate figure cited in the article for the United States is considered the replacement rate for humans. However, the Census Bureau stated that its rate was actually 1.9 last year; it blamed the economic slowdown. Many countries are providing incentives for giving birth (16 of which I have last heard) and those incentive have not been working. There seems to be a clear relationship between modernization and secularism (Max Weber's "disenchantment of the world") and low birth rates. That is why the United States have escaped so far the dramatic birth dearth faced by countries in Western Europe; it's one of the most religious countries of all the Western powers.

4 ^ | v • Reply • Share ›

falzf • 7 days ago

David Barash, thank you, once again for a beautiful, clear, informative essay, and especially for your even tone. In another writer's hands, this essay could easily have turned into a screed.

For me, the saddest part of what you write about is the way civilization, wherever it appears, inexorably seems to devour and destroy so many animal and plant species. The Romans wiped out whole species in North Africa (for their games, no less), the Dutch hunted the dodo bird to extinction (almost as soon as they encountered it), and the white man shot buffalo from trains (for "sport"--until the vast herds were reduced to a pathetic couple of thousand).

Perhaps in order to save the beauty of diversity of our planet--to save its beauty, very simply--our species needs to suffer a horrific disaster--a 21st-century equivalent of the Biblical flood (some sort of devastating disease, or a meteor striking the planet might just do the trick).

Laurie Fendrich

^ | v • Reply • Share ›

Vixenvena • 7 days ago

So should we be having more sex or not?

^ | v • Reply • Share ›

gerard_harbison • 6 days ago

This is so 1970's.

I heard an interesting idea, mind you, from the nice young man John Holdren. Why don't we put something in the water supply to reduce people's fertility?

^ | v • Reply • Share ›

rguffey • 5 days ago

This is a very good essay by David Barash. However, as our historian and geographer Peter Griffin notes, the comparison between the UK and Egypt is not quite accurate. The Inhabitable area of Egypt is about 35,000 square kilometers,

population is about 80 million. In contrast, the area of the UK (greatly

population is about 82 million. In contrast, the area of the U.S. (mostly habitable) is about 244,000 square kilometers, population a bit over 64 million.

^ | v • Reply • Share ›

 [Subscribe](#)

 [Add Disqus to your site](#)

 [Privacy](#)