

## Heard the One About the 600,000 Chinese Engineers?

By Gerald W. Bracey  
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People and organizations create statistics for a purpose -- to call attention to a problem, or to argue for a policy change. Americans consume vast quantities of statistics every day. Most zip in and out of our brains, but others somehow take root in the gray matter, then move about the culture as something that everyone just "knows."

Among such recent attention-getting statistics are 600,000, 350,000 and 70,000. These are, allegedly, the number of engineers produced in 2004 in China, India and the United States, respectively. The numbers first drew major notice when they appeared in a Fortune magazine story on July 25, 2005. The cover showed a brawny China bullying a scrawny Uncle Sam on the beach, a parody of the old Charles Atlas comic book body-building ads. "Is the U.S. a 97-Pound Weakling?" the cover asked. We're losing our competitive edge, the article stated, citing the numbers above.

These numbers attained seemingly impeccable credibility when they were featured in a press release last October about a new report from the Committee on Science, Engineering and Public Policy, a joint group from the National Academy of Sciences, National Academy of Engineering and Institute of Medicine (which, with the National Research Council, are collectively known as the National Academies). "Last year more than 600,000 engineers graduated from institutions of higher education in China," the report stated. "In India the figure was 350,000. In America, it was about 70,000." To dramatize the seriousness of the issue, the academies titled the 543-page report "Rising Above the Gathering Storm," an allusion to Winston Churchill's book "The Gathering Storm," about events leading up to World War II.

Naturally, given this lofty pedigree, the statistics then materialized in the New York Times, Boston Globe, Chicago Tribune and on many Web sites. While Times columnist Thomas L. Friedman did not use these specific numbers in his 2005 bestseller, "The World Is Flat," he did write that Asian universities currently produce eight times as many bachelor's degrees in engineering as U.S. universities do.

Carl Bialik, who writes the "Numbers Guy" column in the Wall Street Journal, was suspicious. He had previously examined the Fortune numbers and concluded that they were inflated, so he sought to find their source. The most likely origin for the 600,000 Chinese engineers was a 2002 speech by Ray Bingham, then-chief executive of a semiconductor company. Bialik couldn't find any obvious birthplace for the Indian figures, but National Science Foundation analysts told him the number was unlikely to be anywhere near 350,000. As for the academies' report, Deborah Stine, who led the study, told Bialik that the committee had "assumed Fortune did fact-checking on their numbers" and so used them. Meanwhile, a McKinsey Global Institute report had cast doubt on the quality of the Chinese engineering graduates, so Bialik reasoned that removing unqualified candidates would obviously reduce the total.

The 2004 China Statistical Yearbook, issued by the Chinese government, reports 644,000 engineering graduates that year. But the yearbook merely assembled the numbers sent by provincial governments. The accuracy of these provincial reports is unknown, and it is unclear whether the provinces shared common definitions -- the word "engineer" does not translate easily into many Chinese dialects.

In fact, about half of what China calls "engineers" would be called "technicians" at best in the United States, with the equivalent of a vocational certificate or an associate degree. In addition, the McKinsey study of nine occupations, including engineering, concluded that "fewer than 10 percent of Chinese job candidates, on average, would be suitable for work [in a multinational company] in the nine occupations we studied."

After an exhaustive study, researchers at Duke University also pummeled the numbers. In a December 2005 analysis, "Framing the Engineering Outsourcing Debate," they reported that the United States annually produces 137,437 engineers with at least a bachelor's degree while India produces 112,000 and China 351,537. That's more U.S. degrees per million residents than in either other nation.

Among major media outlets, thus far only the Christian Science Monitor has joined the Wall Street Journal in examining the competing statistics. (A few others have referenced the Duke study). In a December 2005 article, the Monitor quoted Rochester Institute of Technology professor Ron Hira as saying: "Business groups have been very smart about trying to change the subject from outsourcing and offshoring to the supposed shortfall of U.S. engineers. There's really no serious shortage of engineers." Yet, while the National Academies replaced the erroneous numbers with the numbers from Duke, Stine stood by her original conclusion, telling the Monitor that "the U.S. is well behind other countries."

Statistics that end up as conventional wisdom even when they're wrong usually become popular by being presented as fact in a highly visible and respected source -- such as a cover story in Fortune or a National Academies report.

Once a statistic has attained the status of something we all "know," it takes on a charmed life. It is hardly surprising that the National Academies report gave rise to many citations. Yet even after the Duke report and other demurrals, these spurious throngs of Chinese and Indian engineers remain alive and well, appearing, for example, in a Newsweek opinion piece last winter by Education Secretary Margaret Spellings. Commerce Secretary Carlos M. Gutierrez repeated the numbers in March to a meeting of the National Association of Manufacturers, and Sen. John W. Warner (R-Va.) cited them in April during an appearance at a Fredericksburg science expo for middle-school students.

We probably will not be done with the 600,000, 350,000 and 70,000 false comparison for a long time. If ever.

[gbracey1@verizon.net](mailto:gbracey1@verizon.net)

*Gerald W. Bracey is author of "Reading Educational Research: How to Avoid Getting Statistically Snookered" (Heinemann).*