

A Review by Norton Starr

Special Section: *How to Lie with Statistics Turns Fifty*. *Statistical Science* 20:3 (August 2005), pp. 205-260

Darrell Huff and Fifty Years of *How to Lie with Statistics*, Michael Steele. 205-209.

Lies, Calculations and Constructions: Beyond *How to Lie with Statistics*, Joel Best. 210-214.

Lying with Maps, Mark Monmonier. 215-222.

How to Confuse with Statistics or: The Use and Misuse of Conditional Probabilities, Walter Krämer and Gerd Gigerenzer. 223-230.

How to Lie with Bad Data, Richard De Veaux and David Hand. 231-238.

How to Accuse the Other Guy of Lying with Statistics, Charles Murray. 239-241.

Ephedra, Sally Morton. 242-248.

In Search of the Magic Lasso: The Truth About the Polygraph, Stephen Fienberg and Paul Stern. 249-260.

The fiftieth birthday of Darrell Huff's famous "How to Lie with Statistics" provided the occasion for these sequels. The title of Huff's book is both a blessing and a curse. To its credit, such a come-on attracted a huge readership, helping to make this the best-selling statistics book of all time. Unfortunately, it suggests a wrong-headed view of statistics and unfairly imputes malice as cause for the numerous errors that do infect the use of data. The present collection of articles does an excellent job of showing the manifold ways things can go wrong *or* right in the collection, presentation, use, and implications of data.

The introductory article by Steele charmingly recounts the history and the factors leading to the success of the book. Readers may be surprised to find out that Huff was a writer, not a statistician. Steele's sketch of Huff's pioneering effort includes pointers to contemporary works that carry on Huff's legacy: He mentions prominent authors such as Tufte, Paulos, Best, and such books as the recently successful "Freakonomics" and the older "How to lie with your Mac"! The remaining articles include impressive accounts of the various ways statistics can present distorted realities. Some trace the origins of their emphases to Huff's seminal examples, while others are largely independent of the book being honored.

Joel Best, a sociologist and author of two recent books in the spirit of Huff, takes pains to point out that statistics are "social constructs": Although some purveyors of "lies" aim to mislead, most statistics unintentionally represent a slant. These biases are a result of choices as to what questions are asked, what data are gathered, how they are gathered, how they are used, and how the results are communicated. Consequently, Best feels the distinction between liars and statistics is misleading: without malice, most uses of data are the results of inherent choices, however invisible to the analysts or their audience.

Mark Monmonier's essay "Lying with Maps" is surprisingly enlightening. The variety of ways the construction of maps can affect the message they send is striking, even if obvious when explained as in this article.

Krämer and Gigerenzer give a host of unfortunately common abuses, primarily of conditional probability, where the common error amounts to confusing the chance that event A occurs given that event B occurs with the chance that B occurs given that A occurs. Some of their most unsettling examples arise in the

critical realm of medical diagnoses. They persuasively advocate a different way of dealing with conditional probability, a notion with "singularly clumsy terminology" and prone to misuse. Though Gigerenzer has written extensively on the matter, the examples here are more varied than in his article summarized in a previous MH: "Communicating Statistical Information" (*Science* 290:5500, 12/22/2000), V. 32, May 2001, pp. 230-231.

De Veaux and Hand give a revealing presentation of the ways data can be unsuited to the task at hand: "How bad data can arise, what kinds of bad data exist, how to detect and measure bad data, and how to improve the quality of data that have already been collected." Numerous telling examples enliven this essay.

The compact essay by Charles Murray is a masterful, if sad, enumeration of various ways to discredit a book in social research. Knowledgeable readers will recognize Murray as coauthor with the late Richard Herrnstein of the controversial "The Bell Curve: Intelligence and Class Structure in American Life" (Free Press, 1994). It's evident that Murray was burnt by the reaction to their book, an experience that must have driven the advice given here.

Sally Morton's article on ephedra gives readers unusual insight into the way the FDA dealt with a problematic dietary supplement issue. Unlike prescription drugs, such supplements need not prove efficacy and safety in order to be marketed. Instead, it's up to the FDA to demonstrate their lack in order that a ban be imposed. "How did the FDA decide what data were relevant to its decision" to ban ephedra? "How did the FDA argument for the ban differ from a decision based solely on statistical hypothesis testing?" Morton explains the systematic review approach taken and the meta-analysis methodology used. This is a rare opportunity to find out how a life-or-death decision was made under considerable uncertainty.

The final article is a compelling account of a federally commissioned study of the polygraph, stemming from allegations of spying at Los Alamos in the late 1990's. Despite the difficulty of assessing a forensic device developed over eighty years ago, the study and this article "explain the limited scientific basis for its use, the deep uncertainty about its level of accuracy and the fragility of the evidence supporting claims of accuracy in any realistic application." The authors remark that the federal study in effect turns Huff's book on its head, noting, "It was a triumph for careful statistical analysis and presentation, telling the truth about what we know about attempts to detect lying." Although government policies were partially altered as a consequence, innocent people are still at risk from polygraph screening's false positive rate, and a nontrivial proportion of those bent on evil will escape this device's finger of suspicion.

These articles are both a compliment to and complement Huff's path breaking adventure in writing. This issue of *Statistical Science* is destined to be a collector's item.