HOW TO LIE WITH STATISTICS

Darrell Huff

Illustrated by Irving Geis

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There are three kinds of lies: lies, damned lies, and statistics.
—Disraeli

Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.
—H. G. Wells

It ain’t so much the things we don’t know that get us in trouble. It’s the things we know that ain’t so.
—Artemus Ward

Round numbers are always false.
—Samuel Johnson

I have a great subject [statistics] to write upon, but feel keenly my literary incapacity to make it easily intelligible without sacrificing accuracy and thoroughness.
—Sir Francis Galton

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How to Lie with Statistics

By
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Illustrated by IRVING GEIS

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To my wife
WITH GOOD REASON

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Acknowledgments

THE PRETTY little instances of bumbling and chicanery with which this book is peppered have been gathered widely and not without assistance. Following an appeal of mine through the American Statistical Association, a number of professional statisticians—who, believe me, deplore the misuse of statistics as heartily as anyone alive—sent me items from their own collections. These people, I guess, will be just as glad to remain nameless here. I found valuable specimens in a number of books too, primarily these: *Business Statistics*, by Martin A. Brumbaugh and Lester S. Kellogg; *Gauging Public Opinion*, by Hadley Cantril; *Graphic Presentation*, by Willard Cope Brinton; *Practical Business Statistics*, by Frederick E. Croxton and Dudley J. Cowden; *Basic Statistics*, by George Simpson and Fritz Kafka; and *Elementary Statistical Methods*, by Helen M. Walker.

Introduction

“THERE’S a mighty lot of crime around here,” said my father-in-law a little while after he moved from Iowa to California. And so there was—in the newspaper he read. It is one that overlooks no crime in its own area and has been known to give more attention to an Iowa murder than was given by the principal daily in the region in which it took place.

My father-in-law’s conclusion was statistical in an informal way. It was based on a sample, a remarkably biased one. Like many a more sophisticated statistic it was guilty of semiattachment: It assumed that newspaper space given to crime reporting is a measure of crime rate.

A few winters ago a dozen investigators independently reported figures on antihistamine pills. Each showed that a considerable percentage of colds cleared up after treatment. A great fuss ensued, at least in the advertisements, and a medical-product boom was on. It was based on an eternally springing hope and also on a curious refusal to look past the statistics to a fact that has been known for a long time. As Henry G. Felsen, a humorist and no medical authority, pointed out quite a while ago, proper treatment will cure a cold in seven days, but left to itself a cold will hang on for a week.

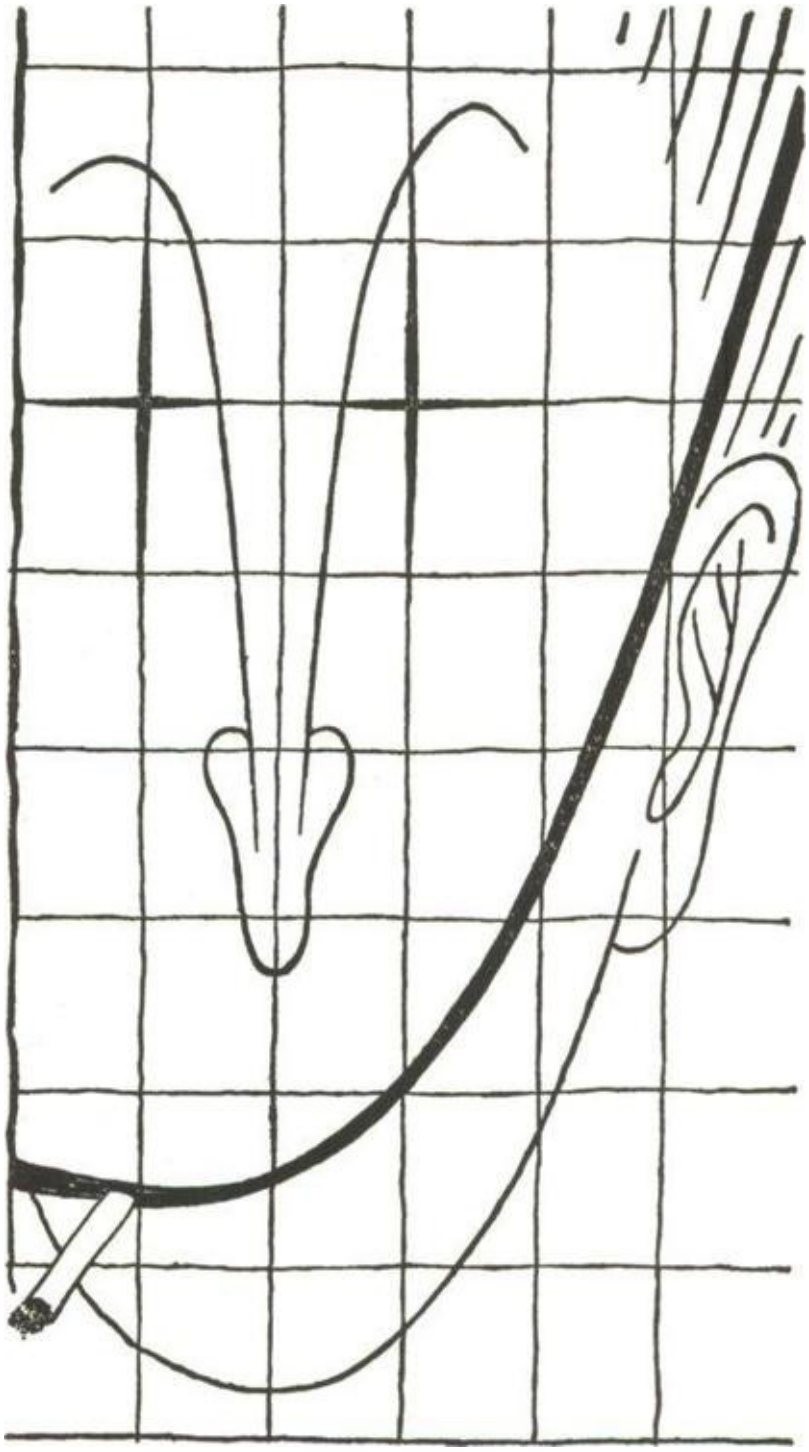
So it is with much that you read and hear. Averages and relationships and trends and graphs are not always what they seem. There may be more in them

than meets the eye, and there may be a good deal less.

The secret language of statistics, so appealing in a fact-minded culture, is employed to sensationalize, inflate, confuse, and oversimplify. Statistical methods and statistical terms are necessary in reporting the mass data of social and economic trends, business conditions, “opinion” polls, the census. But without writers who use the words with honesty and understanding and readers who know what they mean, the result can only be semantic nonsense.

In popular writing on scientific matters the abused statistic is almost crowding out the picture of the white-jacketed hero laboring overtime without time-and-a-half in an ill-lit laboratory. Like the “little dash of powder, little pot of paint,” statistics are making many an important fact “look like what she ain’t.” A well-wrapped statistic is better than Hitler’s “big lie”; it misleads, yet it cannot be pinned on you.

This book is a sort of primer in ways to use statistics to deceive. It may seem altogether too much like a manual for swindlers. Perhaps I can justify it in the manner of the retired burglar whose published reminiscences amounted to a graduate course in how to pick a lock and muffle a footfall: The crooks already know these tricks; honest men must learn them in self-defense.



CHAPTER 1

The Sample with the Built-in Bias

"THE AVERAGE Yaleman, Class of '24," *Time* magazine noted once, commenting on something in the New York Sun, "makes $25,111 a year."

Well, good for him!

But wait a minute. What does this impressive figure mean? Is it, as it appears to be, evidence that if you send your boy to Yale you won't have to work in your old age and neither will he?

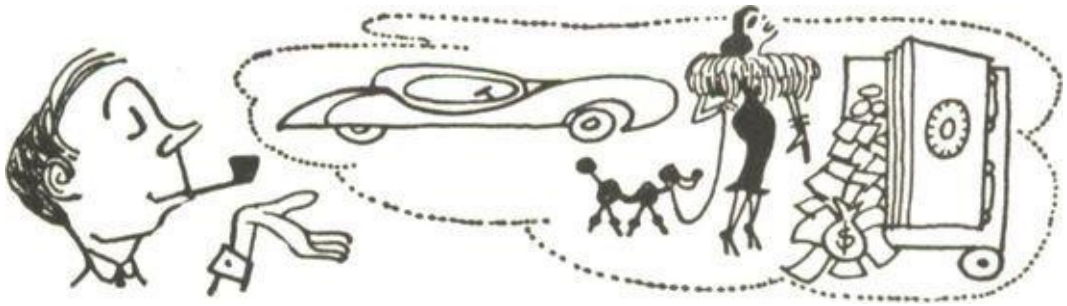
Two things about the figure stand out at first suspicious glance. It is surprisingly precise. It is quite improbably salubrious.

There is small likelihood that the average income of any far-flung group is

ever going to be known down to the dollar. It is not particularly probable that you know your own income for last year so precisely as that unless it was all derived from salary. And $25,000 incomes are not often all salary; people in that bracket are likely to have well-scattered investments.

Furthermore, this lovely average is undoubtedly calculated from the amounts the Yale men *said* they earned. Even if they had the honor system in New Haven in ’24, we cannot be sure that it works so well after a quarter of a century that all these reports are honest ones. Some people when asked their incomes exaggerate out of vanity or optimism. Others minimize, especially, it is to be feared, on income-tax returns; and having done this may hesitate to contradict themselves on any other paper. Who knows what the revenuers may see? It is possible that these two tendencies, to boast and to understate, cancel each other out, but it is unlikely. One tendency may be far stronger than the other, and we do not know which one.

We have begun then to account for a figure that common sense tells us can hardly represent the truth. Now let us put our finger on the likely source of the biggest error, a source that can produce $25,111 as the “average income” of some men whose actual average may well be nearer half that amount.



This is the sampling procedure, which is the heart of the greater part of the statistics you meet on all sorts of subjects. Its basis is simple enough, although its refinements in practice have led into all sorts of by-ways, some less than respectable. If you have a barrel of beans, some red and some white, there is only one way to find out exactly how many of each color you have: Count ’em. However, you can find out approximately how many are red in much easier fashion by pulling out a handful of beans and counting just those, figuring that the proportion will be the same all through the barrel. If your sample is large enough and selected properly, it will represent the whole well enough for most purposes. If it is not, it may be far less accurate than an intelligent guess and