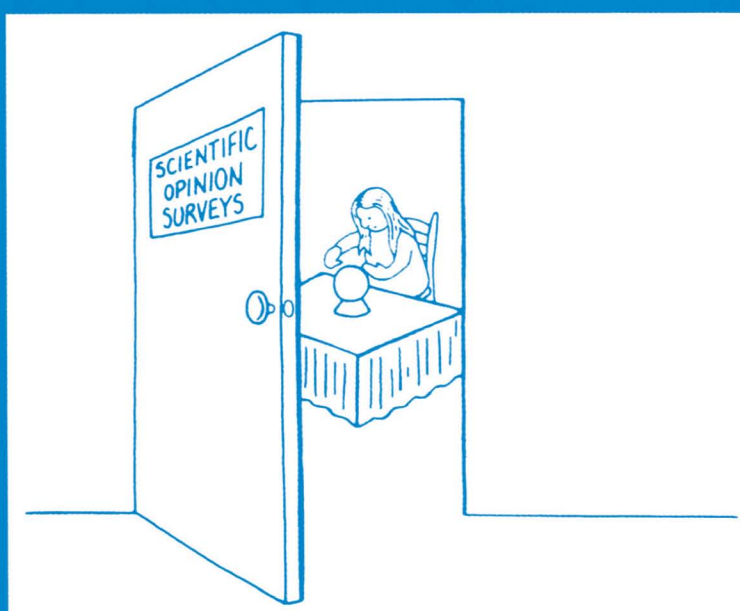


HOW TO TELL THE LIARS FROM THE STATISTICIANS

ROBERT HOOKE



How to Tell the Liars from the Statisticians

POPULAR STATISTICS

a series edited by

D. B. Owen

*Department of Statistics
Southern Methodist University
Dallas, Texas*

Nancy R. Mann

*Biomathematics Department
University of California at Los Angeles
Los Angeles, California*

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How to Tell the Liars from the Statisticians

ROBERT HOOKE

*Statistics Consultant
Pinehurst, North Carolina
Formerly, Manager, Mathematics
Westinghouse Research and Development Center*

with illustrations by JOSEPH M. LILES

*Professor of Art
North Carolina School of Science and Mathematics
Durham, North Carolina*



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For
Annis
who helped and insisted

. . . it is clear that nobody who does not understand insurance and comprehend to some degree its enormous possibilities is qualified to meddle in national business. And nobody can get that far without at least an acquaintance with the mathematics of probability, not to the extent of making its calculations and filling examination papers with typical equations, but enough to know when they can be trusted, and when they are cooked.

George Bernard Shaw
“The Vice of Gambling
and the Virtue of Insurance”

Preface

Liars, as portrayed on screen and in fiction, are often charming rogues, while statisticians are always persons of infinite dullness. In real life, this is not the way you tell one from the other.

Faces sometimes chosen for ability to project sincerity flash onto our television screens, toss a few facts and numbers at us, and quickly vanish. They seem to be confident that we'll agree that their numbers can lead to only one conclusion and most viewers seem to believe them. The few doubters include those with inside knowledge, congenital skeptics, and statisticians, who are left saying, "Yes, but . . .," as the next commercial appears.

The science of statistics has made great progress in this century, but progress has been accompanied by a corresponding increase in the misuse of statistics. The public, whether it gets its information from television, newspapers, or newsmagazines, is not well prepared to defend itself against those who would manipulate it with statistical arguments. Many people either believe everything they hear or come to believe in nothing statistical, which is even worse.

Good statistical practice is an absolute necessity to any advanced society, and we can't afford to neglect this valuable tool just because some people misuse it. This book was written in the belief that informed citizens, with or without any interest in statistics per se, or in mathematics or proba-

Preface

bility in general, can enjoy learning some of the ways of distinguishing good statistical reasoning from bad.

This book, simply and without formulas, shows how statistical reasoning affects nearly all aspects of our lives. It touches on drug testing, discrimination, sports, political polls, compulsive gambling, gun detectors, cancer research, crime and punishment, opinion surveys, advertising, mass production, and doctors' waiting rooms. These and a host of other examples are used to show that statistics, far from being a dull subject about collections of numbers, is one of great interest to almost anyone who ever has hard decisions to make.

Robert Hooke

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About the Series

Statistics is the essence of the scientific method — it is used across all major disciplines. The aim of the Popular Statistics series is to present individual and unique volumes written with the nonmathematically oriented reader in mind. Although statistically oriented toward applied areas such as business, technology, science, medicine, law, and economics, these volumes require no prior statistical training and are “ready to read.”

It is hoped that these books will be read and used in the same spirit that they were written — with great enthusiasm and a desire to increase knowledge of the power of statistics.

D. B. Owen
Nancy R. Mann

1

Statistics Are — Statistics Is

Almost everyone has heard that “figures don’t lie, but liars can figure.” We need statistics, but liars give them a bad name, so to be able to tell the liars from the statisticians is crucial.

It is commonly believed that anyone who tabulates numbers is a statistician. This is like believing that anyone who owns a scalpel is a surgeon. A statistician is one who has learned how to get valid evidence from statistics and how (usually) to avoid being misled by irrelevant facts. It’s too bad that we apply the same name to this kind of person that we use for those who only tabulate. It’s as if we had the same name for barbers and brain surgeons because they both work on the head.

Most people think of statistics as plural: collections of numbers and little else. To statisticians, statistics is singular: a fascinating subject that relates to almost everything we do. A quick glance at the index will support this position. Statistics-singular deals with things other subjects dismiss as unpredictables (“your mileage may vary”), with chance and choice and trade-offs, with the basis of government policy, with cause and effect, and so with the very essence of science.

The formal educational process provides very little information about statistics-singular to most students. This leaves the students vulnerable to those individuals I call the data pushers, who, somewhat like dope pushers, try to gain control over us with their product. “Liars” may be too