

Preface

This is a first draft of a free (as in speech, not as in beer,) (although it is free as in beer as well) textbook for a one-semester, undergraduate statistics course. It was used for Math 156 at Colorado State University–Pueblo in the spring semester of 2017.

Thanks are hereby offered to the students in that class who offered many useful suggestions and found numerous typos. In particular, Julie Berogan has an eagle eye, and found a nearly uncountably infinite number of mistakes, both small and large – thank you!

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Here Twain gives credit for this pithy tripartite classification of lies to Benjamin Disraeli, who was Prime Minister of the United Kingdom in 1868 (under Queen Victoria), although modern scholars find no evidence that Disraeli was the actual originator of the phrase. But whoever actually deserves credit for the phrase, it does seem that statistics are often used to conceal the truth, rather than to reveal it. So much so, for example, that the wonderful book **How to Lie with Statistics**, by Darrell Huff, gives many, many examples of misused statistics, and yet merely scratches the surface.

We contend, however, that statistics are not a type of lie, but rather, when used carefully, are an *alternative* to lying. For this reason, we use “or” in the title of this book, where Twain/Disraeli used “and,” to underline how we are thinking of statistics, correctly applied, as standing in opposition to lies and damned lies.

But why use such a complicated method of telling the truth as statistics, rather than, say, telling a good story or painting a moving picture? The answer, we believe, is simply that there are many concrete, specific questions that humans have about the world which are best answered by carefully collecting some data and using a modest amount of mathematics and a fair bit of logic to analyze them. The thing about the Scientific Method is that it just seems to work. So why not learn how to use it?

Learning better techniques of critical thinking seems particularly important at this moment of history when our politics in the United States (and elsewhere) are so divisive, and different parties cannot agree about the most basic facts. A lot of commentators from all parts of the political spectrum have speculated about the impact of so-called *fake news* on the outcomes of recent elections and other political debates. It is therefore the goal of this book to help you learn **How to Tell the Truth with Statistics** and, therefore, how to tell when others are telling the truth ... or are faking their “news.”