

# Chapter 1

## Telling the Quants from the Quacks: Evaluating Statistical Arguments in Debates Online

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### ABSTRACT

*Determining the credibility of statistical research has traditionally been done through peer-reviewed journal publications. With the recent increase in research shared in online forums comes emerging challenges for authors sharing results and for readers determining if research is valid. This chapter introduces a heuristic for evaluating the credibility of statistics based on methods used to counteract claims made in *The Bell Curve*. The approaches gleaned from this case are then updated for online environments and demonstrated using contemporary online debates about climate change science and skepticism. The heuristic for evaluating credibility of statistical arguments online is useful for readers and as a guide for authors adapting their research for online publication and debate.*

### INTRODUCTION

Numbers have been described many times as a universal language. With their ubiquity and precision, the use of numbers allows information to travel quickly through different communities. However, numerical communications rely on taken-for-granted structures of practice that give numbers their credibility and legitimacy. Traditional validity strategies, the strategies that demonstrate research is credible and empirically grounded, include triangulation (the use of multiple types of evidence), a basis in previous research, and peer-review (Creswell, 2009, p. 191). For research shared online, however, there are frequently no guarantees for the provenance of information being shared, and the speed at which information is generated has increased ten-fold, leaving less time for review and correction (Terras & Ramsay, 2012). As a result, questionable information is shared by readers when it is expressed numerically and therefore appears credible. There are also researchers who have done the hard work, performing time-consuming

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research, who run the risk of their work being ignored if they do not share it online in a way that attracts the attention of readers. Telling the “quants,” those with legitimate claims to expertise and knowledge in data, from the “quacks,” those who make claims that are not supported by research or experience, has become incredibly difficult with computer-mediated communication.

This chapter addresses new challenges for authors in establishing authority—and for readers in determining credibility—when quantification and statistical methods are used in online debates. Whether the statistical arguments are in the form of original results or paraphrased from other primary sources, the stakes are high. With the Internet being a facilitator for education, communication, and political argument, it is crucial that authors have the tools to share their work persuasively and for readers to have the literacy necessary to evaluate research critically. The online debate over the credibility of statistical methods in climate change is one crucial case: Each side appears to use reliable rhetoric and evidence to justify their position. How are lay audiences to know which side is correct? How should scientists explain their work online so that it is perceived as authoritative? To answer these questions, this chapter introduces a heuristic developed from the controversial debate centered on *The Bell Curve*, Herrnstein and Murray’s (1994) *New York Times* bestseller. This heuristic is based on the critical responses to Herrnstein and Murray’s research and is adapted to the exigencies of online communication. The method is demonstrated using the popular climate change websites *Watts Up With That? The World’s Most Viewed Site on Global Warming and Climate Change* and *Skeptical Science: Getting Skeptical about Global Warming Skepticism*. The proposed heuristic helps readers sort the “quants” from the “quacks” while simultaneously providing a guide to authors for gaining the attention and respect of their online audience.

## LITERATURE REVIEW

### Credible Statistics

There is a lack of contemporary literature on the relationship between statistical evidence and online credibility. While there are numerous resources on digital ethos, they tend to be content-agnostic, and statistics and research design require specialized approaches to evaluate their credibility. At the same time, the online environment complicates many traditional approaches to trusting statistics. Two well-known analogue resources on statistics and credibility are Best’s (2001) *Damned Lies and Statistics* and Huff’s (1954) *How to Lie with Statistics*. Best covered the two primary causes for bad statistics:

1. The use of bad data and dubious interpretations, and
2. The “mangling” of statistics once they are being used by secondary sources (2001, p. 5).

However, his advice for thinking critically about statistics only covers basic, descriptive statistics such as percentages and averages. While critical approaches for basic statistics are important, they cannot help the reader with inferential statistics and the complex reasoning needed to understand research design. This chapter addresses the gap by considering critical approaches to inferential statistics while building from Best’s (2001) observation, “We think of statistics as facts that we discover, not as numbers we create. But, of course, statistics do not exist independently; people have to create them” (pp. 160-1). Best recommended that a critical reader ask questions about a statistic’s origin, focus on definitions, measurement, and sampling, and attend to how claims can be misleading or make inappropriate comparisons.

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