



Dr. Edward Tufte
PhD in political science from Yale

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Rhetorical Theory with Anne Aronson
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Part I: Key Ideas

Dr. Tufte's warns writers, researchers and chart makers to remain aware of data presentation and interpretation issues including the following:

- **Confirmation bias**

This refers to the trap of charting data in the way best to support your hypothesis, even if charting the data differently invalidates your hypothesis.

- **Improper contextual assessment of cause and effect**

For example, charting time of death by cholera would not have adequately tested Snow's hypothesis; whereas, citizen proximity to pump wells did test the potential cause.

- **Not making adequate comparisons**

For example, Snow compared sick and healthy populations within the city.

- **Chartjunk (a term coined by Tufte that indicates artwork distractions)**

This refers to any artwork or textual arrangement that detracts from legibility or causes the viewer to concentrate on the display more than the data.

- **Noting potential sources for error**

For example, Cholera deaths began to decline even before the pump handle was removed. This was noted, but it was explained by population exit due to disease concerns.

- **Choosing the correct graphing method and order, such as time versus examined variable**

For example, some of the charts for the Challenger disaster were arranged by launch time; even though the hypothesis under examination was outside temperature.

- **Making sure the logic of the chart reflects the logic of the analysis**

In other words, the Challenger hypothesis suggested a negative correlation between temperature and failure rates (as the temperature went down, the failures went up). A chart that plotted only these two variables would be most appropriate.

- **Evaluating alternative explanations**

Snow found that beer drinkers were less likely to suffer from cholera. He could have evaluated the medicinal properties of beer as a cure, and he would have had a supporting chart to prove his theory. However, by cross checking against pump water consumption, the beer theory never came to a head.

- **Always keeping the goal of finding, telling and showing the truth (there is that word “truth” again)**

This is the crux of all of Tufte’s warnings and admonitions. Seek to show the truth regardless of bias, ego or inconvenience. Do not chart data just for the sake of having a pretty graph. Chart data in a meaningful way that supports or detracts from your hypothesis.

Part II: Selected Passage

“Sometimes it can be difficult for researchers- who both report *and* advocate their findings- to face up to threats to their conclusions, such as alternative explanations and contrary cases” [Tufte, p.32].

In reading Tufte, I detect a graduated scale of potential obfuscation. The scale spans from poor data elucidation due to ignorance to purposeful deception by data manipulation. In between, data can be honestly presented but made ineffective because of chart artwork. Or, the artwork might be acceptable but the data is charted incorrectly. Moving further down the line, the researcher may see several possible ways to chart the data, and select the one that presents his or her hypothesis in the best light. In this case, it becomes especially important to

document possible errors or alternative hypotheses. The best solution to the worst scenario is peer review.

Part III: Connections with Other Readings or Events



From Da Vinci's 15th-century painting, I created this version called "The Last PowerPoint." In it, Edward Tufte admonishes that using tiny bunnies and eggs in the presentation is chartjunk. He warns that the clutter will cause future confusion. His audience is obviously aghast.

Tufte's article discusses best ways to find truth and the how to avoid obstacles to this end. Frankly, this course could be renamed "Rhetorical Theories of Discovering Truth." I love that about this course.

In my last journal entry, I discussed a debate with my visiting missionary father-in-law that began around the dinner table regarding evolution and Christian creationism. The debate continues over email. He currently awaits my response from his last email. During our discussion, he learned he needed to update his views. He discovered the world of "Intelligent Design."

Can you image Edward Tufte critiquing a chart of biological development using the Intelligent Design hypothesis? In the middle of the chart, the presenter would proclaim, "...and this is where we believe magic occurred to advance the organism over this biological hurdle" (Talk about having difficulty facing up to potential errors in hypothesis).

I realize that using the word "magic" is not very Rogerian of me. I am working on that. However, the closest euphemism is "miracle". With Intelligent Design hypothesis, the need to investigate any alternative hypothesis is nullified by the "discovery" of the miracle event in the development sequence. This "discovery" stops inquiry. It halts comparative analysis. It extinguishes curiosity. All of which, would mortify Tufte from a data analysis perspective.

In searching for truth, Tufte would insist on "documenting the sources and characteristics of the data" [Tufte, p. 53]. Perhaps he would point out that non-testable data sources are even less valuable than chartjunk. I bet he would call it "chartbunk".