

Tufte's principles of excellence and integrity

In Chapter 1 of *The Visual Display of Quantitative Information*, Tufte discusses Graphical Excellence. He opens with the following list of what graphical displays should do:

- Show the data
- Induce the viewer to think about the substance, rather than about methodology, graphic design, the technology of graphic productions, or something else.
- Avoid distorting what the data have to say
- Present many numbers in a small space
- Make large data sets coherent
- Encourage the eye to compare different pieces of data
- Reveal the data at several levels of detail
- Serve a reasonably clear purpose: description, exploration, tabulation, or decoration
- Be closely integrated with the statistical and verbal descriptions of a data set.

He concludes with the following *Principles of Graphical Excellence*:

Graphical excellence is the well-designed presentation of interesting data—a matter of substance, of statistics, and of design.

Graphical excellence consists of complex ideas communicated with clarity, precision and efficiency.

Graphical excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least ink in the smallest space.

Graphical excellence is nearly always multivariate.

And graphical excellence requires telling the truth.

In Chapter 2, he presents the following *Principles of Graphical Integrity*:

The representation of numbers as physically measured on the surface of the graphic itself, should be directly proportional to the numerical quantities represented.

Clear, detailed and thorough labeling should be used to defeat graphical distortion and ambiguity. Write out explanations of the data on the graphic itself. Label important events in the data.

Show data variation, not design variation.

In time-series displays of money, deflated and standardized units of monetary measurement are nearly always better than nominal units.

The number of information-carrying (variable) dimensions depicted should not exceed the number of dimensions in the data.

Graphics must not quote data out of context.

He also introduces the Lie Factor, which is a ratio:

(Size of the effect shown in graphic)/(size of effect in data)

In chapter 1 of Stephen Few's *Show Me the Numbers*, he states the following key purpose of quantitative displays:

To provide the reader with important, meaningful and useful insight

And then quotes Tufte:

...above all else, show the data