

Review of Edward Tufte's Speech

Note:

4 dogs exp → important: sample size & design must make sense

Getting it “right” in data analysis

Galileo → “thinking eye”: from wordy speculation → visible certainty

CDC project → 2M keystrokes, 106M cases & 1M deaths prevented → strong evidence vaccines work

Analytical thinking = relation between evidence, inference & conclusions

Hardware (high-res screens) → makes big data visualization & video possible

Swiss maps → no chart junk, clear, content-driven, gentle 3D, good typography

Google Maps → huge info still readable → amount ≠ readability

Key: open mind but not empty head + analytical thinking

fMRI → 70% false positives

FDA prespecification → pre-plan tables & models, avoid fake findings

People can't keep own score (iPhone steps cheated)

Check original measurements → avoid “sampling to please”

Avoid time vampires (NYT, email, Twitter) → start with work

Survival bias (stone vs wood castles) → ask: “How do I know this?”

Review:

Edward Tufte's speech focus on a simple but powerful message: data analysis must be about getting it right, not simply producing convenient results. He argues that research should be designed carefully in advance and then tested honestly, rather than manipulated afterward to fit expectations. This principle, he believes, is the foundation for trustworthy science.

To support his message, Tufte shares a wide range of vivid examples. From Galileo's discovery of the stars and his notion of “visible certainty”, to the CDC's project that demonstrated how vaccines prevented 106 million cases of childhood disease, these cases highlight how strong evidence can change knowledge and save lives. At the same time, he warns us with cautionary tales: the collapse of Google Flu due to overfitting, the 70% false-positive rate in fMRI research, and even the way an iPhone step counter can be fooled by simple tricks. These examples remind us how fragile truth can be when analysis is careless.

From the speech, Tufte encourages us to cultivate a disciplined mindset. We should

observe how data is truly collected in the real world, not just accept the numbers on a screen. We must keep an open mind, but also remain rigorous and critical in our reasoning. Above all, we must avoid self-deception and continue to ask the essential question: “How do I know this?” Only by doing so can data science live up to its promise of revealing truth rather than illusion.

This article was originally written in Chinese by the author. AI was used only for translation into English.