Ethics and statistics

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What is an "ethics problem"?

You are considering an action that . . .

- benefits you or some cause you support
- hurts or reduces benefits to others
- violates some rule.

Example

- A company gives you $10,000 to assist in research with a new drug, with a promise of $100,000 more if it is successful.
- But the data are inconclusive: 20/100 deaths with the treatment, 21/102 deaths with the control
- Should you . . .
  - look deeper for evidence that the new drug is better?
  - do an analysis you suspect is wrong?
  - do an analysis you know is wrong?
  - fake the data?

He wouldn't share his videotaped data

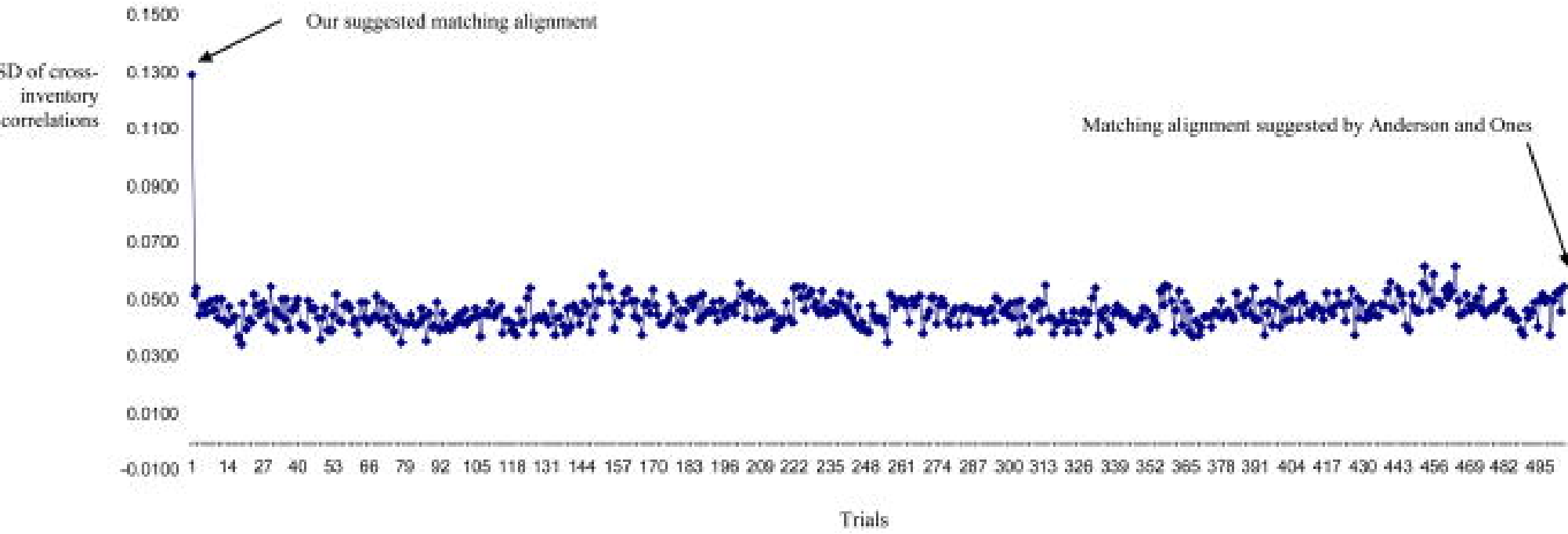
Marc Hauser Resigns From Harvard

By Tom Bartlett

Marc D. Hauser, the Harvard psych
found responsible for eight counts
misconduct by the university, has r
ending speculation about whether
embattled professor would return t
this fall.

In a letter dated July 7, Mr. Hauser
Michael D. Smith, Harvard's dean o

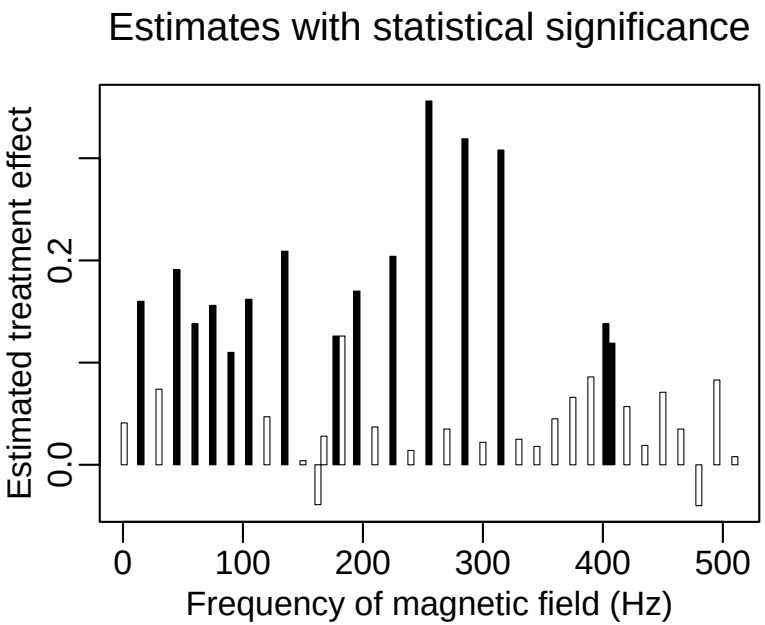
"No irrefutable proof"

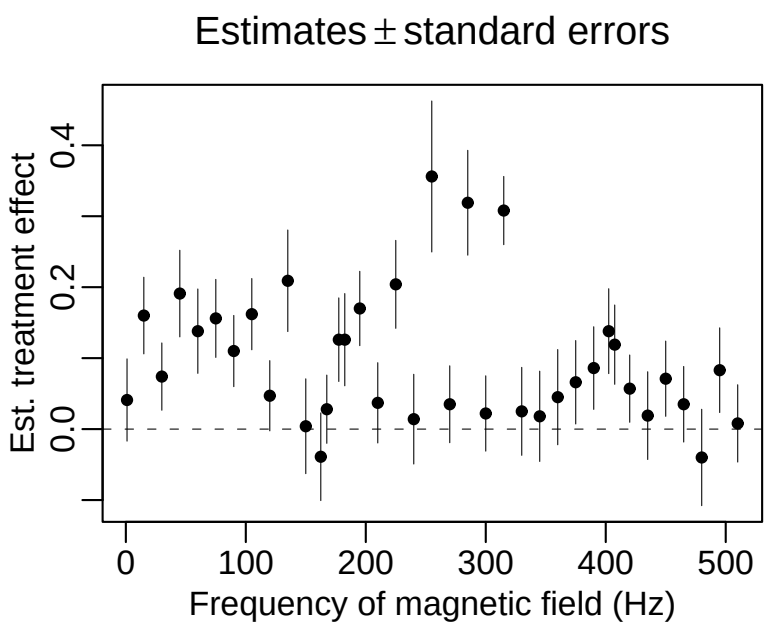


Tough calls

- Fake "ethical dilemmas"
  - The polluting factory
- Real ethical dilemmas
  - Allocation of scarce resources
  - When to gather data and when to approve new treatments
- Ethics includes process, intermediate outcomes, and long-term outcomes
- *Any* ethics violation can be made ambiguous
- This does not negate the importance of ethics
- Statisticians should be able to appreciate the necessity of decision-making under uncertainty and ambiguity

Ethics depends on what you know



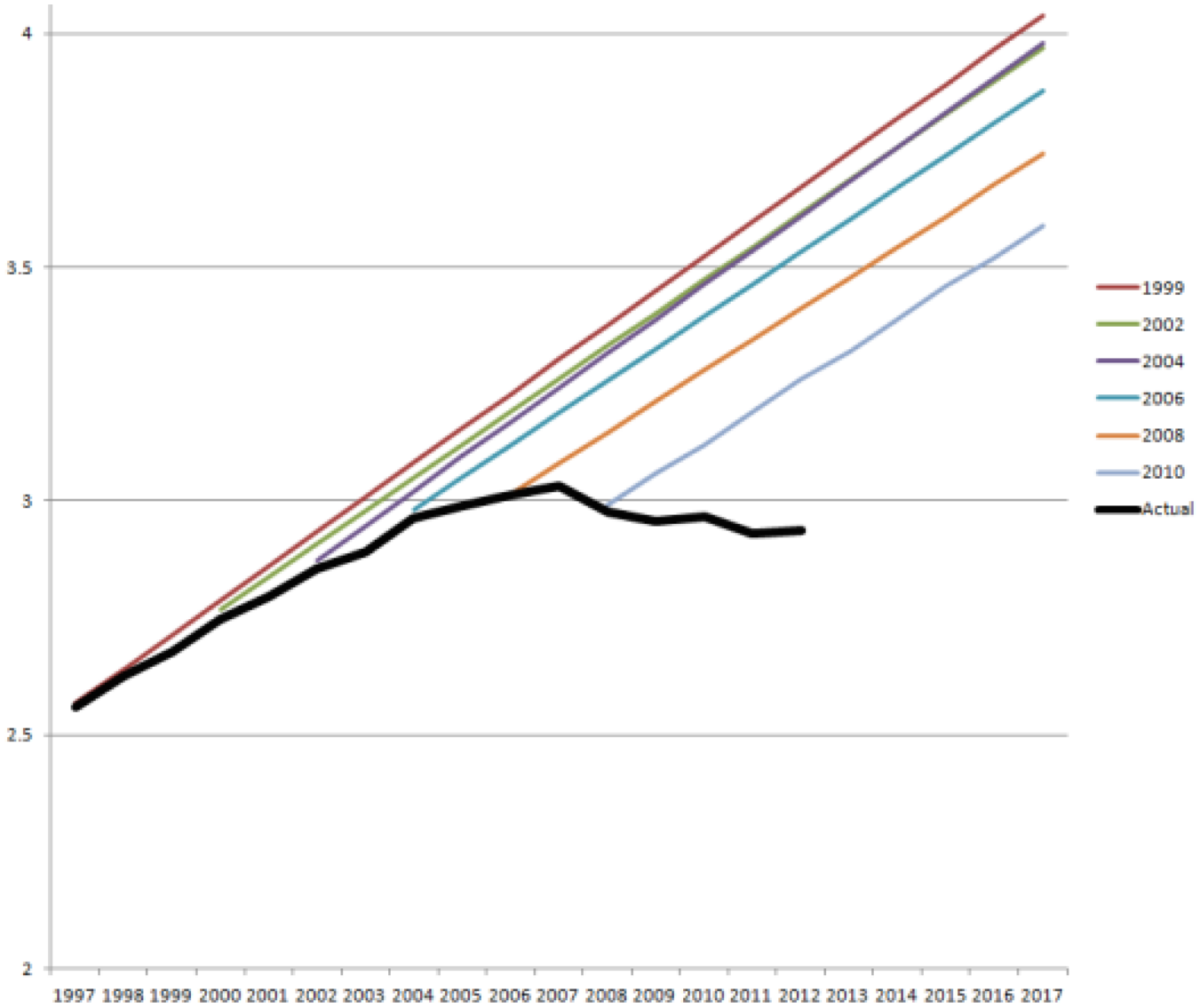


- Background: health effects of electromagnetic fields
- Problems with the Blackman et al. study
  - Use of statistical significance to categorize effects
  - Noise added in the form of a comparison to an extra control group
- But they didn't know better!
- But . . . an ethics violation . . . they refused to share their data

Some ethical problems involving uncertainty

- Cost-benefit analysis for environmental hazards
  - Problem with "zero tolerance" for risk
  - Problem with no regulation
- Medical statistics:
  - The impossibility of equipoise
  - Informed consent and randomization
  - Long-term benefits of a new treatment

The Commissar for Traffic presents the latest Five-Year Plan



Thinking about ethics

- Laziness
- Lying, cheating, and stealing
- Mistakes such as selection bias
- Systematic remedies (the replication and criticism movement)
- Tradeoffs regarding uncertainty
- Is it possible to be an ethicist without being mean to people?

Are mainstream statistical methods themselves unethical?

- P-values and statistical alchemy
- "The AAA tranche of subprime science"
- Bayesian inference and subjective science
- The statistical significance filter
- Incentives to exaggerate

Find the ethical problem!

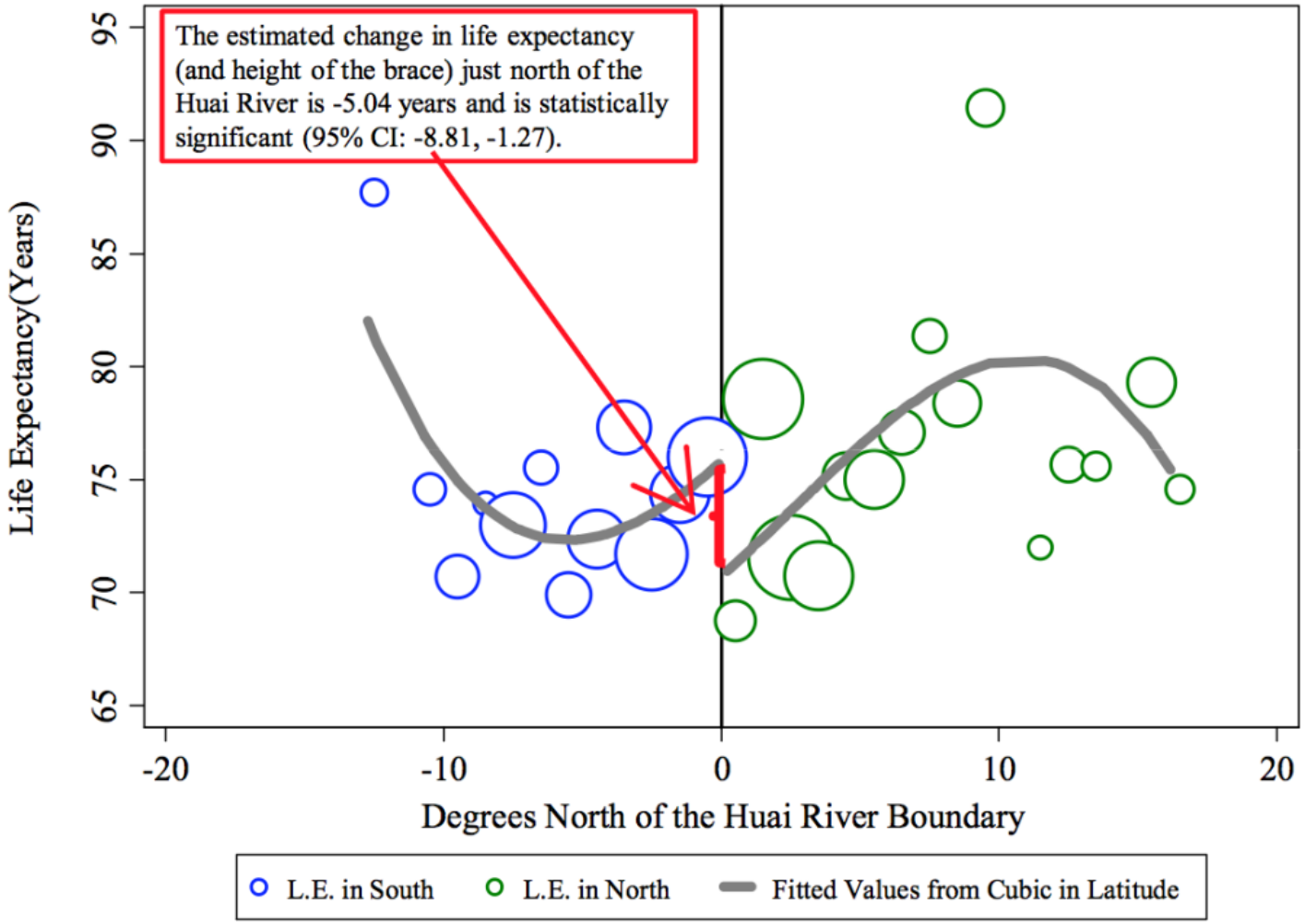


Fig. 3. The plotted line reports the fitted values from a regression of life expectancy on a cubic in latitude using the sample of DSP locations, weighted by the population at each location.

Some writings on ethics by statisticians

- Douglas G. Altman, "Statistics and ethics in medical research" (seven-part series) *British Medical Journal* **281–282** (1980–1981).
- Steven N. Goodman, "Ethics and evidence in clinical trials," *Clinical Trials* **2**, 195–196 (2005).
- Iain Chalmers, "The scandalous failure of science to cumulate evidence scientifically," *Clinical Trials* **2**, 229–231 (2005).
- Donald B. Rubin, "The ethics of consulting for the tobacco industry," *Statistical Methods in Medical Research* **11**, 373–380 (2002).
- James H. Ware, "Investigating therapies of potentially great benefit" (with discussion), *Statistical Science* **4**, 298–340 (1989)

Some other references on ethics

- Lawrence Kohlberg, "Moral stages and moralization: the cognitive-developmental approach," in T. Lickona, ed., *Moral Development and Behavior: Theory, Research, and Social Issues*, 31–53. New York: Holt, Rinehart, and Winston (1978).
- Sissela Bok, *Lying: Moral Choice in Public and Private Life.* New York: Pantheon Books (1978).
- Ezekiel J. Emanuel, David Wendler, and Christine Grady, "What makes clinical research ethical?" *Journal of the American Medical Association* **283**, 2701–2711 (2000).
- much more . . .