

STATISTICS IN THE REAL WORLD: ESSAY 3  
Jo Hardin Fall 2018

The third paper will be a research paper describing how statistics (as a discipline, as a set of data analysis tools, as individual people, etc.) are/were involved in creating or reinforcing systemic inequality or social injustice. 1500 - 2000 words (concise is best!).<sup>1</sup>

INSTRUCTIONS

Your final paper will center around a research question which will be argued using sources that you find. The research question will likely evolve over the life of the project, but you should keep coming back to the (evolving) idea you want to argue. In addition to a succinct and arguable thesis statement, your paper should include:

1. Details of the event of interest.
2. Historical context (*why* the thing you describe happened / was able to happen).
3. You might also give the reader an idea of possible solutions (how to make it better) or maybe a counter argument.
4. A potential audience for your paper is a STEM undergraduate who feels disempowered by the traditional canon. If your paper speaks to a different audience, please talk to me before turning in your assignments.

IDEAS FOR GETTING STARTED INCLUDE:

- Some of the founders of the discipline of statistics were eugenicists.
- Original medical studies were done entirely on white men.
- Contributions to the field of statistics that were by individuals in marginalized roles were attributed to white men.
- Current algorithms and AI protocols reinforce existing structures and are often biased against marginalized communities. (Summary and ideas here: <https://www.infoq.com/presentations/unconscious-bias-machine-learning>.)
- Statistical models were used as part of redlining.
- Tuskegee Study of Untreated Syphilis in the Negro Male or Willowbrook Study.
- Statistical models used to argue biological determinism (e.g., see **The Mismeasure of Man** by Stephen Jay Gould and related controversy ... <http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1001071> and [http://blogs.nature.com/news/2011/06/did\\_stephen\\_jay\\_gould\\_fudge\\_hi.html](http://blogs.nature.com/news/2011/06/did_stephen_jay_gould_fudge_hi.html) )

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<sup>1</sup>Thanks to Vin De Silva, Jorge Moreno, Janice Hudgings, Tomas Summers Sandoval, Pam Bromley, and Kara Wittman for their ideas and suggestions on this essay prompt.

- If scientific knowledge, data-based arguments, and logical & critical reasoning are *sound* ways of discovery, why were some of the statistics (STEM generally) founders so prone to racist / misogynist / ableist / etc. ideas? That is, what can we *know* from science and what can we *never know* from science?

#### ASSIGNMENT TIMELINE

**Micro-essay.** Write a proposal for your research and paper. Your proposal should include the specific research question of interest with possible responses (provide three different possible responses indicating different directions your research might go). Additionally, you should provide some ideas (or possibly sources) for the evidence you will use to address the problem. 500 words maximum.

*Sunday, November 18.*

**Annotated Bibliography.** Submit a bibliography of three to five scholarly articles that describe either the event of focus or the impact of the event you describe. Identify each article in one of the standard bibliography formats, and write a **few sentences** for each article summarizing its content (no need to give a detailed summary about the entire work). Additionally, provide a few sentences about what each source says about your research question.

*Sunday, November 25. Note: Thanksgiving weekend!!!*

**Version 1.** This is a complete and polished essay. Your research question should be clear, but it may have evolved through the process.

*Sunday, December 2.*

**Peer review.** Groups of three or four. Same format as before, but you will meet outside of class.

*Monday, December 3 - Wednesday, December 5.*

**Version 2.** This is a complete and polished essay. The essay should answer your research question in the form of an argument.

*Sunday, December 9.*

**Class presentation.** Five minutes per person (or participation in a poster session combined with other classes).

*Tuesday, December 11 (Wednesday, December 12).*

#### ANNOYING FORMATTING DETAILS

Really annoying requirements that will again make it easier to read many papers:

- Identify your overall thesis (the core argument around which the entire essay is organized) **and bold-face it.**
- Identify the topic sentence of each paragraph and underline or *italicize* it.

- Name the file you upload to Sakai like this: Paper#.LastName.Doc, as in Paper2.Gallup.doc.
- Double-spaced with 12 point type and at least 1 inch margins to write comments in.
- Any reference / citation formatting is fine, but be consistent.
- Print a word-count at the end.

#### AN ASIDE

It is important to point out that statistics / statisticians have also been forces of good in myriad ways.<sup>2</sup>

- Pearson and Fisher were eugenicists, but their work in statistics and genetics played pivotal roles that have led to the modern, scientific, debunking of eugenics.
- Cyril Burt both made contributions to statistics and misused statistics to lie about his “data” in his studies of heredity and IQ in twins. However, statisticians and their professional societies have explicit policies against inventing and modifying data.
- Statistical models were used for redlining... and also in court cases against it. One could investigate the statistical arguments brought by Thurgood Marshall and the NAACP to argue against segregation and “separate but equal”. Or the current statistically-based arguments against race-based gerrymandering (that just won a court case in GA).

There have clearly been misuses of statistics in support of inequality, but we should be careful not to assume that the entire field of statistics is designed to produce systemic inequality.

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<sup>2</sup>Thanks to Paul Velleman for pointing out contributions of statistics to producing systemic inequalities.