

Math That Lies: Communicating Why Some Quantitative Arguments Are Misleading or Bogus

Calderwood Seminar in Public Writing

Instructor: Neal Koblitz, Professor of Mathematics, koblitz@uw.edu

Course Zoom meetings on Wednesdays 11:30–2:20

“There are three kinds of lies: lies, damned lies, and statistics.”

–Often attributed (falsely) to 19th century British Prime Minister Benjamin Disraeli

“Las matemáticas no mienten, pero los mentirosos usan las matemáticas.”

(Math doesn’t lie, but liars use math.)

–Uldarico Malaspina, Professor of Mathematics at the Pontificia Universidad Católica del Perú

When encountering arguments using numbers or equations, even well-educated people are often paralyzed — like deer in the headlights — and lose their capacity for critical thinking. For decades, some public writers have been trying to change this — Darrell Huff, John Allen Paulos, and more recently Cathy O’Neil, Adam Kucharski, and (here at UW) Carl Bergstrom. The purpose of this course is to help you develop the skills needed to join their ranks and write clearly and perceptively about quantitative arguments.

Calderwood Seminars are part of a system of courses designed to promote excellence in public writing by undergraduates. It started at Wellesley in 2013, and has gradually spread to over a dozen other universities, including UW starting in 2019. The course requires commitment, curiosity, and a critical mindset.

LEARNING GOALS

- To increase your skill and confidence as writers.
- To learn how to collaborate effectively as editors and workshop participants.
- To learn how to process, analyze, and criticize mathematical arguments related to socially important controversies.
- To learn how to communicate in clear, crisp, lively, and error-free prose about the challenges and pitfalls in interpreting quantitative information.

The key to improving your writing during this course will be to participate fully and thoughtfully in the writer-editor relationship and in the workshopping on Wednesdays. In that way you will develop your skill at giving and taking constructive feedback.

READINGS

The reading material consists of three books and various articles that I'll upload to Canvas. The books are:

- Weapons of Math Destruction : How Big Data Increases Inequality and Threatens Democracy by Cathy O'Neil (paperback is currently available on Amazon for \approx \$15).
- The Rules of Contagion : Why Things Spread – and Why They Stop by Adam Kucharski (currently available on Amazon for \approx \$20).
- The Bedford Handbook by Diana Hacker and Nancy Sommers (the 11th edition costs over \$60 on Amazon, but the etextbook costs about half that).

OVERVIEW OF ASSIGNMENTS

Week 0 (before Jan 6): Please read (1) “Mathematics As Propaganda” (10 pages) and (2) a chapter from How To Lie with Statistics (pp. 76-88). They are posted on Canvas under “files.” Please be prepared to discuss these readings during the first class meeting on Jan 6.

Week 1 (Jan 6): The first meeting will cover the goals and organizational details of the course, discuss the two readings, practice copy-editing some sentences, and prepare for the first written assignment. First assignment (roughly 250 words) due Jan 11 no later than 6 pm (on Google Docs, shared with the whole class). Everyone (all writers, no editors the first week) writes a letter to the editor commenting on Shiller's op-ed. Explain either some part of his quantitative argument that you liked (giving a clearer explanation than he gave) or a part that you believe is fallacious (clearly explaining why its logic is faulty), or both. Please read classmates' letters to the editor and prepare for class by writing down some comments on each one. In addition, during the week you might start reading the book The Rules of Contagion so that you'll have two weeks to read it.

Week 2 (Jan 13) Workshopping all of the letters to the editor on the Shiller op-ed (the final version is due on Jan 20); a few more examples of sentences to edit; discussion preparing for the second written assignment, in which group A writes a 1000-word book review of The Rules of Contagion and group B edits (common text).

Week 3 (Jan 20): Workshopping the Group A book reviews (the final version is due on Jan 27) and discussion preparing for the third written assignment. In that assignment Group B writes a 750-word article as might appear in the science section of a newspaper, in which two articles on the UW IHME model of the COVID-19 pandemic are discussed. One of the articles to be read (by Sharon Begley of statnews.com) is highly critical and the other one (by IHME director Christopher Murray) defends the IHME approach (common text).

Week 4 (Jan 27): Workshopping the Group B science articles on the IHME COVID-19 model (the final version is due on Feb 3) and discussion preparing for the fourth written assignment, in which Group A writes a 750-word script for an NPR Academic Minute about “The Formula That Killed Wall Street,” by Felix Salmon in *Wired* magazine (common text).

Week 5 (Feb 3): Workshopping the Group A scripts (the final version is due on Feb 10) and discussion preparing for the fifth written assignment, in which Group B writes a 750-word posting that could appear in a sports blog such as fivethirtyeight.com/sports or insider.espn.com/blog/pac12 about the “hot hand” theory in sports, based on the the article “Twenty years of ‘hot hand’ research: Review and critique” by Bar-Eli, Avugos, and Raab (common text).

Week 6 (Feb 10): Workshopping the Group B blog postings (the final version is due on Feb 17) and discussion preparing for the sixth written assignment, in which Group A writes a 750-word blog posting about election polling that could appear in fivethirtyeight.com/politics or similar political blogs (common text to be determined later). Also, you might start reading Weapons of Math Destruction.

Week 7 (Feb 17): Workshopping the Group A blog postings (the final version is due on Feb 24) and discussion preparing for the seventh written assignment, in which Group B writes a 1000-word book review of Weapons of Math Destruction (common text).

Week 8 (Feb 24): Workshopping the Group B book reviews (the final version is due on March 3) and discussion preparing for the eighth written assignment, in which Group A writes a 750 Group-word op-ed on an example of math that lies (common genre, individual topics selected by the writer, optional joint byline).

Week 9 (March 3): Workshopping the Group A op-eds (the final version is due on March 10). In the ninth assignment Group B writes a 750-word op-ed on an example of math that lies.

Week 10 (March 10): Workshopping the Group B op-eds (the final version is due on March 17) and discussion of portfolios.

Portfolios with Student Reflections (and also Group B’s final versions of op-eds) are due March 17.

WEEKLY RHYTHM OF THE CLASS (weeks 3 through 10)

Each week one half of the seminar participants (say, Group A) will write on the assigned topic. The other half (Group B) will serve as editors and commentators on these essays. In order for the seminar to function smoothly, **all participants need to adhere to the schedule** and complete their roles in a timely fashion. Each essay will go through three stages of revision, using Google Docs.

STAGE 1. Writers share a draft with their assigned editor by a mutually agreed-upon time during the weekend. Editors finish commenting and suggesting edits on the draft no later than noon Monday. When an editor returns the draft to the writer with comments, please share it with me (koblitz@uw.edu).

STAGE 2. Writers produce **revised** drafts and share them with the whole class (use the class email address Honors221c_wi21@uw.edu) and with me no later than noon Tuesday. All participants in the seminar must have read and thought about these revised drafts and (in the case of common text assignments) also finished reading the common text **before**

class discussion on Wednesday afternoon. **Please have notes with comments on the revised drafts** so that you're prepared to discuss the drafts. The seminar will workshop the draft during class.

Workshopping the assignments will take roughly half of the Wednesday class. Some time will also be devoted to previewing the topic for the following week and to discussing writing exercises, including some from the *Bedford Handbook*, that deal with common problems that bring down the quality of public writing (wordiness, poor word choice or word usage, run-on sentence, jargon, cliché, lack of parallelism, dangling modifier, unclear antecedent, wrong tense, passive construction, punctuation error, and so on).

STAGE 3. Final versions of the essays are due in class the following Wednesday. I will assign a grade to the final version.

Please feel free to email me with any questions that you have during the quarter. If you want to talk about something instead of emailing, we can set up a private Zoom meeting.