Balderdash, Codswallop, and Malarkey: Detecting Bad Information

Tuesdays and Thursdays, 9:55-11:10

Will Cipolli: wcipolli@colgate.edu • www.cipolli.com • McGregory Hall 323

Meg Worley: mworley@colgate.edu • Lathrop Hall 213B

Office Hours: *Cipolli + Worley*: Mondays 12:30-1:30 in McGregory 323

Cipolli only: Mondays 1:30-2:30 and Thursdays 12:30-1:30 in McGregory 323 & by appointment

Worley only: Mondays 3:00-4:00 and Thursdays 4:00-5:00 in Lathrop 213B & by appointment

Class blog: http://graphos.colgate.edu/balderdash

TL;DR: Bad information almost always involves bad reporting of statistics, bad experiment design, or both.

This course will introduce students to a scientific approach to understanding the source and validity of information. We will explore the roles of language, mathematics, and computation in knowledge creation in order to challenge preconceptions of "truth" and sources of truth. We will evaluate our daily information consumption and discuss how to recognize misleading or false information. We will also consider how to scientifically evaluate claims heard on the news or in the classroom.

This course takes direct aim at a number of myths:

- that math and language are separate knowledges

- that math is boring

- that writing choices don't affect numerical data

- that numbers reported are always accurate and provide "proof"

- that big numbers mean that something is very important

- that all news is biased

Materials:

- Best, Joel. *Damned Lies and Statistics: Untangling numbers from the media, politicians, and activists*. Univ of California Press, 2001. (DLAS)

- Other readings distributed by professors

Course Objectives:

At the completion of this course, students will be able to:

     1. distinguish between facts and "facts"

     2. understand how statistics translates research questions into research answers

     3. understand how rhetoric translates research answers into public knowledge

     4. discern between good and bad sources of information

     5. create knowledge in a persuasive and straightforward way

Course Requirements

Attendance and bluebook:	10%
Participation and diagnostic exercises:	10%
Blog contributions	10%
Homeworks and quizzes:	30%
Midterms: 10% each x 2	20%
Final Exam:	20%

Grading Scale

A+	96-100	B+	87-89	C+	77-79	D+	67-69
A	93-95	B	83-86	C	73-76	D	63-66
A-	90-93	B-	80-82	C-	70-72	D-	60-62

Policies

Contacting us:

In general, email is the best way to reach us. We check it regularly, and we try to reply immediately (although the response rate declines significantly after supper). If you wrote and got no reply after 36 hours or so, don't hesitate to write again.

Please do come to office hours! It's what they pay us for, and generally, the more you come to office hours, the more you get from the class. You have the choice of talking to one of us or both of us.

Rules of Engagement:

     1. Every member of the class deserves equal respect.

     2. Assume positive intent.

3. Share the microphone with other students.

4. Listen and *learn* what other students say..

5. Be present and engaged.

6. Critique ideas, not people.

7. Everyone has expertise. We can learn something from everyone.

8. Feel responsibility for each other.

9. Encourage others to succeed.

Attendance:

You get three days of leave to use however you need them. That includes colds, flu, hangovers, internship interviews, personal crises, deaths in the family (we hope not!), and paralytic ennui. You don't need to let us know, but be sure to talk to classmates about what you missed; they will give you a better sense of the class than we can. And they will have taken some notes, unlike us. ***You are responsible for all assignments and readings that are due or given out in the class you miss.***

We'd rather you not miss *any* class. Every class you don't attend isn't just discussion you missed; it's also thinking you didn't do -- thinking that you will need for assignments later on. In other words, every missed class handicaps you, even aside from grade penalties. As for those, your grade will drop 1/3 of a grade (i.e., a B+ will transmogrify into a B) for every class you miss after your leave is gone.

If athletic or other institutional obligations will cause you to miss classes, let us know at the beginning of the semester so that we can plan alternative assignments. Institutional absences will not affect your attendance grade, but they often diminish how much you learn. The obligation is on you to minimize that effect.

Prof. Cipolli hates it when students are late. Prof. Worley hates it when people go to the washroom in the middle of class. You really do want us both to stay happy.

Devices:

No laptops in class. They are a temptation to you and a distraction to those around you. Plan on printing out all readings that are distributed electronically. [There's a color printer in the library, for full-color readings.] All the research shows that we comprehend and remember better when we read (and notate) on paper than when we read online.

No texting in class, no posting to Instagram, no answering phone calls.

Readings:

You must bring a hard copy of the day's reading to class with you. Failure to do so will affect your participation grade.

We expect you to look up all words and concepts that you don't know. Occasionally we will check to make sure you are doing this. There is also a tab on the class blog called NEW KNOWLEDGE, where you should add (anonymously) the

word/concept you looked up and its definition. This counts as a contribution to the class blog.

Inclusion:

It is our goal to make this course and our classroom as accessible and inclusive as possible. We know that every student comes with their own, and sometimes difficult, experiences with learning. We aim to make the classroom environment as comfortable and respectful as possible, and we count on your help. Come see us any time if you want to discuss your learning process and needs.

Learning Accommodations and Support:

We are very happy to accommodate both visible and invisible disabilities, and you can be assured that any confidential information entrusted to us will go no further. Colgate has an office in the Center for Learning, Teaching, & Research that is devoted to disability support.   Once you have contacted Academic Support & Disability Services (lwaldman@colgate.edu -- (315) 228-7375), we will work together to make it happen.

Academic Honesty:

Students are expected to follow Colgate's Academic Honor Code. If you feel stressed about exams or deadlines, come see one of us as soon as possible so we can review options to avoid any academic honesty issues. Colgate takes this very seriously, and so should you.

All the work you turn in must be your own, done for this class. The only exceptions are group work (where we will give you clear instructions about the process we expect) and quoting the work (text or image) of others, which must be correctly acknowledged and cited (we'll make our expectations clear there too). Bouncing ideas off of other people is a great habit to get into, and while the Honor Code doesn't require you to say "This idea is my own, arrived at in conversation with the Dalai Lama," it shows a lot of integrity to insert a footnote giving credit where credit's due.

Schedule

Getting into gear

Jan. 22: Introductions and practicalities

Reading: the syllabus

Homework: your obituary headline; questions about and suggestions for the syllabus

Defining the spectrum of good and bad information

Jan. 24: Metaphorizing bad information

Readings:

- Katz, Joel. *Designing Information* (2012): 14-15.
- Lakoff, George, and Mark Johnson. Excerpts from *Metaphors We Live By* (1980).

Listening: Rahman, Zia Haider. "A Picture Held Us Captive: on the impact of metaphors on our comprehension of data." BBC Radio 4.

Jan. 29: Calling bullshit

Readings:

- Holt, Jim. "Say Anything." New Yorker 22 (2005): 69.
- Frankfurt, Harry G. "On Bullshit." Princeton University Press, 2009.

HW: The metaphors we use to convey disrespect for information

Jan. 31: The lifecycle of information

Reading: Will & Meg's Wonderchart

Feb. 5: The lifecycle of information (cont'd.)

Reading: Will & Meg's Wonderchart

HW: BYOB (Bring Your Own Bullshit)

Social Statistics

Feb. 7: Damned lies and statistics

Readings:

- Ioannidis, John PA. "Why most published research findings are false." PLoS medicine 2.8 (2005).
- Ch 1, *DLAS* -- The Importance of Social Statistics

Feb. 12: Damned lies and statistics

Readings:

- Raff, Jennifer. "How to Read and Understand a Scientific Paper." *London School of Economics Impact Blog.*
- Ch 2, *DLAS* -- Soft Facts

HW: research critique

Feb. 14: Misrepresenting statistics

Readings:

- Parkes, C., Benjamin, B., and Fitzgerald, R.Parkes, C. "*Broken heart: a statistical study of increased mortality among*

widowers." British Medical Journal (1969).

- Ch 3, *DLAS* -- Mutant Statistics

Feb. 19: How misinformation spreads

Readings:

- Vosoughi, Soroush, Deb Roy, and Sinan Aral. "The spread of true and false news online." *Science* 359.6380 (2018): 1146-1151.
- Kiely, Eugene and Robertson, Lori. "How to Spot Fake News." FactCheck.Org, 18 Nov. 2016
- Cadwalladr, Carole. "The Cambridge Analytica Files: The Story So Far." *The Guardian*, March 31, 2018

HW: Using the IFLA method to check top shared news content (Buzzsumo).

Information Tools

Feb. 21: Visualization

Readings:

- Knaflic, Susan. Ch. 1-3, *Storytelling with Data*.
- Mireilles, Isabel. Pp. 47-96, *Designing Information*.
- Yau, Nathan. Ch. 3 & 4, *Data Points.*

Feb. 23: Measurements

Readings:

- Few, Stephen. "Logarithmic Confusion." Visual Business Intelligence (2018).
- Kufs, Charlie. "The Measure of a Measure." Stats with Cats Blog (2010).
- Ch 4 & 6, *DLAS* -- Apples and Oranges & Thinking About Social Statistics

HW: Critique of visual data presentation

Feb. 28: Correlation, Causation, and Reproducibility

Readings:

- Aschwanden, Christie. "There's No Such Thing As 'Sound Science'." FiveThirtyEight, 6 Dec. 2017.
- Nuzzo, Regina. "Scientific method: statistical errors." *Nature News* 506.7487 (2014): 150.
- Wasserstein, Ronald L., and Nicole A. Lazar. "The ASA's statement on p-values: context, process, and purpose." (2016).
- Baker, Monya. "1,500 scientists lift the lid on reproducibility." *Nature News* 533.7604 (2016): 452.

HW: Defining a measuring stick for something we can't measure directly.

Mar. 5: *flex day/review day/snow make-up day*

March 7: MIDTERM 1

A new schedule will be distributed at this time

Case Studies

Mar. 19: Healthcare and Medicine

Mar. 21: Healthcare and Medicine

Mar. 26: American Politics

Mar. 28: International Politics

Apr. 2: Education

Apr. 4: Education

Apr. 9: MIDTERM 2

Apr. 11: Dating
Apr. 16: Dating
Apr. 18: Justice and Prison
Apr. 23: Justice and Prison
Apr. 25: Social Sciences
Apr. 20: The Role of Language
May 3: The History of Misinformation

May 6, 12-2pm: FINAL EXAM