

FIRST YEAR SEMINAR: DATA DETECTIVES: UNCOVERING MISTAKES, MISCONDUCT AND FRAUD

Instructor: Dr. Kate Laskowski

Meeting times: Wednesdays 3:10-4pm, Storer 0335 (in the basement)

General description of the course:

We stand on the shoulders of giants – science is an iterative process where each new study builds on previous studies. But what if previous studies are not sound? How can science move forward if it has a crumbling foundation?

In this First Year Seminar we will explore what happens when scientific papers are found to suffer from mistakes, misconduct and sometimes even outright fraud. Publications are the lifeblood of a scientist and retractions of published studies are comparatively rare. Each week, we'll read about a case study of a research paper that has been retracted from the literature and act as "data detectives" to uncover what went wrong and most importantly, whodunit? We'll deal with cases where retractions were a result of honest mistakes and others where more nefarious motives were at play to understand the necessity, importance and sometimes stigma, associated with retractions. Students will learn to be skeptical and critical consumers of bold claims and better understand the ethics of scientific research and publishing.

This course will seek to develop effective communication skills in students as students will be required to read and discuss paper retractions with their peers. By taking a deep dive into the what's, how's and why's of research retractions, this course will also help cultivate ethics by exploring the motives of the actions of all parties that can be involved in retractions, including that of the publishing scientists, collaborators, publishers, and universities to better understand the implications of these actions for the scientific community and the general public.

Grading:

Students will be expected to do roughly ten pages of reading prior to each weekly meeting. These readings will often cover a primary literature study and then an associated blog post or article that describes the nature of the problems uncovered in the study. Each week, students will need to submit a short quiz (i.e. discussion questions) prior to the start of class that answers a few key questions about each week's reading. In class, students will work in pairs or small groups to discuss the reading guided by more in-depth questions posed by the instructor. Each student will be expected to lead 1-3 discussions per quarter (based on the number of students in the class).

Students will be assessed on completion of the pre-class discussion questions (8 assignments, 60% of the grade) and leading of and participation in the in-class discussions (20%), and the completion of the Final Reflection. The course will be graded P/NP and a passing grade is award to undergraduate students in courses that otherwise would receive a grade of C- (70%) or better.

Final Reflection:

Document that reflects back on what we've discussed in this course. Each student will select a potential policy that can be put in place to limit research problems and will need to discuss the costs and benefits of such a policy. Who will be affected by it? What problems will it catch? Will it create new problems? What will be exceptions to the policy? Who will enforce it? Finally, also discuss what you'll remember from this course – what will stick with you the most?

Weekly topics:

Week	Topic/reading list	Pre-class quiz due by 3:00pm on:
1	Intro – what is peer review and when does it fail?	NA
2	Does disorder encourage racism? Diedrik Stapel and suspicious coauthors <i>Stapel & Lindenberg 2011 Science</i> Stapel's audacious academic fraud (NY Times Mag)	Jan 18 (by 3:00pm)
3	Do spiders show social niches? Jonathan Pruitt and the importance of open data <i>Laskowski et al. 2016 Am Nat</i> What to do when you don't trust your data	Jan 25
4	Do similar fish eat similar food? Dan Bolnick and honest mistakes <i>Bolnick & Paull 2009 Evol Ecol Res</i> Wrong a lot?	Feb 1
5	Do plaques cause Alzheimer's? Sylvain Lesne and the ethics of medical research <i>Lesne et al. 2006 Nature</i> Blots on a field?	Feb 8
6	Does ocean acidification cause behavioral impairment? Danielle Dixon and the power of replication <i>Dixson et al. 2010 Ecol Lett</i> <i>Clements et al. 2022 PLOS</i> Star marine biologist committed fraud	Feb 15
7	Does talking to a gay person change opinions about gay marriage? Michael LaCour and whistleblowers <i>LaCour & Green 2014 Science</i> How two grad students uncovered an apparent fraud	Feb 22
8	Do power poses increase confidence? Amy Cuddy and questionable research practices <i>Carney et al. 2010 Psych Sci</i> When the revolution came for Amy Cuddy	Mar 1
9	What happens after problems are found in papers?	Mar 8
10	What is the future of scientific publishing and science more generally?	NA