Debating Politics and Science
Communication Studies 467
Josh Pasek, Ph.D.
Winter, 2017

Course Meetings:
MW – 4:00-5:30PM
2333 Mason Hall
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Office Hours:
W – 2:30-3:30PM
5413 North Quad
and by appointment

In 1931, Wilbur Glenn Voliva offered a $5,000 prize for anyone who could prove that the earth was round. Many tried, all of them failed. Without the ability to launch into space, no one had really observed the shape of the globe. It was simply assumed from a series of scientific results.

Fifty years later, Stephen Hawking (1988) recounted a story in which the philosopher Bertrand Russell was giving a speech about astronomy:

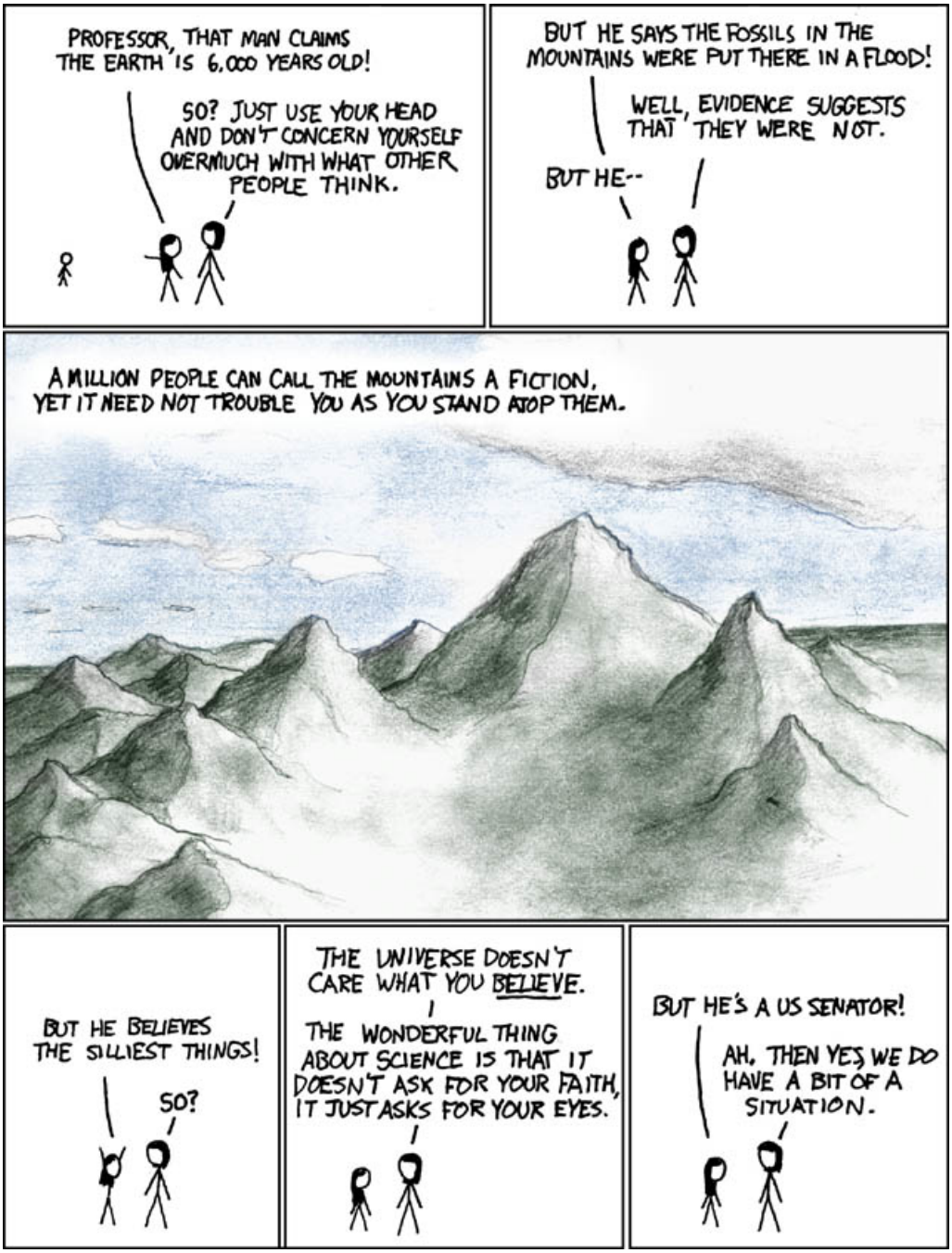
> *'He described how the earth orbits around the sun and how the sun, in turn, orbits around the center of a vast collection of stars called our galaxy. At the end of the lecture, a little old lady at the back of the room got up and said: "What you have told us is rubbish. The world is really a flat plate supported on the back of a giant tortoise." The scientist gave a superior smile before replying, "What is the tortoise standing on?" "You're very clever, young man, very clever," said the old lady. "But it's turtles all the way down!"'*

What makes you believe that the earth is round and that we are not all living on the back of an infinite stack of turtles? Have you ever seen a chromosome or a quark? How about electricity? Most of what we "know" about science comes from textbooks and second-hand reports. These reports can shape the way we think about the world we live in and the way we act within in.

How safe is genetically engineered broccoli? Can you really be addicted to the Internet? Will cell phones give you brain cancer? And if so, is there anything the government should do about it?

In this class, we explore how the public consumes science and how scientific findings translate into public policy. Three contemporary topics – Intelligent Design, Climate Change, and Autism – illustrate where science and public policy collide. With these topics as a foundation, we not only evaluate what counts as science, but see how the impact of scientific findings are shaped by the media, by public opinion, and by political debates. What we know does not come directly from the laboratory, but rather from carefully crafted journalistic standards. These

standards can convince us (or at least sway our opinion) toward the contemporary notion that the world is round, or perhaps – under other circumstances – toward the view that turtles are indeed in play.



http://xkcd.com/154/

Requirements:

Class Meetings:

The class meets on Mondays and Wednesdays from 4:00PM to 5:30PM in Mason Hall, room 2333. Students are expected to attend all classes and to complete all reading and paper assignments in advance of the class listed on the syllabus.

Class Skills:

The structure of this class is designed to help you do more than simply learn a set of facts that you can repeat to others that may be interested in the topic (though much of what we will talk about can encourage a fun, if not always civil, dinner conversation). Instead, the assignments, readings and discussions in this class are designed to help you master a number of critical learning and life skills that you will continue to use wherever you go after you have completed your degree. These skills have been termed the six Cs, and they include:

1. *Collaboration* – The ability to work well with others and be part of a larger social environment
2. *Communication* – The ability to speak and write in ways that clearly express your ideas
3. *Content* – Core knowledge of the subject area
4. *Critical thinking* – The ability to scrutinize and connect the things you are learning together, both within and across areas
5. *Creative innovation* – The ability to build on what you have learned to generate new ideas that push the bounds of current knowledge and capacities.
6. *Confidence* – The willingness to take risks (intellectual or otherwise)

Each aspect of this course has been designed to build on at least one and typically many of these skills. I will try to talk about some of the pedagogical benefits of the class structure and of major assignments on the first day. You should also feel free to ask me about how the things we are doing build on these skills.

Discussion Leadership:

At the end of each of the three major topics in the class, a group of students will lead a discussion on the policy implications of the science, communication, and public opinions that we have considered. On the first day of class, students will sign up as part of a group to lead one of these discussions. Prior to leading each discussion, students should meet as a group and send me an outline of their proposed discussion. **This should be provided no less than 48 hours in advance of the discussion.** I will send back comments on this outline **no less than 24 hours in advance of the discussion** to help the group improve the discussion.

Opinion Papers:

Throughout the term, you will be asked to write two opinion pieces that draw on topics we have been discussing. These opinion pieces should be written as arguments for a particular claim you wish to make, backed up by evidence. They should be between 4 and 6 pages in length (double-spaced, 12 pt font, 1 inch margins). These opinion pieces should (1) begin with either a general introduction or anecdote to provide to context, (2) make an overarching claim, that is backed up by a couple of clearly identified and articulated reasons (which directly support your claim), (3) leverage evidence to support each of your reasons, and (4) make it clear why the evidence supports the argument. These papers will be graded on how well they present an organized argument and the quality of the evidence and reasoning that are used. The use of subsections demarcated with headers to illustrate the main points of the argument is strongly encouraged for the ease of the reader. You may turn these in at any time, but the first piece will be due no later than February 6th and the second will be due no later than March 13th.

After you complete each opinion piece, we will schedule an opportunity to meet one-on-one for 10 minutes to talk about the piece and to discuss potential improvements to the writing. You will then have an additional week to make changes to that paper before I give it a final grade. These meetings can be scheduled on the Canvas calendar.

Final Paper:

In addition to the opinion papers, students will be expected to produce one longer term paper of 8-12 pages (double-spaced, 12 pt font, 1 inch margins), which will be **due by the start of class on Wednesday, April 12th**. Final papers for this class should use APA style references (American Psychological Association, 2009). Late papers will be penalized ½ grade point per 6 hours. This larger paper will explore the science, news, public opinion, and policy framework surrounding one of three issues that we did not focus on in class. The paper will need to show 1) why the scientific issue you choose has substantive policy implications, 2) what the state of the science actually is, 3) how that science is being reported in the media, 4) what the public thinks about the science, and 5) how that relates to policy considerations on the issue. Also, be sure to discuss what the core points of contention are and your thoughts on whether the messages being conveyed at each step in this process are appropriate or not.

Some possible topics for the final paper:

- Is Fracking Safe?
- How Risky are Genetically Modified Foods?
- Should Taxpayers Pay for Universal Preeschool?
- (I am open to other topics if you check with me in advance)

Final Paper Presentations:

At the end of the term, each student will present for 10-minutes on what they discovered when researching their papers. Once all the students who discussed a particular topic present their papers, there will be a few minutes for Q&A. These presentations will be spread across the last two days of class (April 12th and 17th).

Reading Responsibility:

This course includes a fair amount of reading, some of which is fairly dense. I do not expect any of you to perfectly recall all the evidence that each author uses to make his or her points. Doing so would pose an unreasonable burden. That said, skipping reading assignments hurts the entire class and diminishes our ability to grapple with the material and to understand the issues at hand. For every reading that is assigned, it is your responsibility to understand 1) what the author is arguing, and 2) what basic evidence is leveraged in support of the author's claim. **For each class, please write down at least one question – either clarifying or for discussion – that you had from the day's readings and bring it to class, I may call on you to present these questions.**

Grading:

15% - First Opinion Paper (Due any time before Feb 15th)
15% - Second Opinion Paper (Due any time before Mar 22nd)
20% - Group Discussion
25% - Final Paper (Due April 12th)
10% - Final Paper Presentation
15% - Attendance and Participation

Required Text:

There is one required book for this class. The first reading assignment from the book will be due in early March. Please plan to acquire a copy in advance.

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.

Because of the focus on writing quality in this class, I also recommend that students obtain a copy of:

Strunk Jr., W., & White, E. B. (2000). *The Elements of Style (4th Ed.)*. Longman: New York.

Course Policies:

Special Accommodations:

Any student who has a need for accommodation based on the impact of a disability, religious practice, physical requirement, or medical need should contact me privately to discuss the specific situation as soon as possible.

Absences:

Sickness. If you are sick, please send me an email as soon as you are aware that you may miss class. If you are sick for an extended period of time, your absence will only be excused if you provide a doctor's note in addition to emailing me.

Religious holidays. Within the first two weeks of the semester, please notify me of any religious holidays for which you will be absent. If a holiday is sufficiently important that you will miss class, you should know the dates in advance.

Athletic and other university-related absences. If you are travelling to represent the University of Michigan, someone on your team will provide you with the appropriate paperwork to distribute to your instructors.

Other excusable absences. For family emergencies, funerals, and other such absences, please send me an email as soon as you are aware of the potential for missing class.

A Note on Academic Freedom and Controversial Subjects:

Many of the subjects we will be discussing in this class are highly controversial and sometimes touch on matters of strongly held beliefs. It is both my responsibility as an instructor and your responsibility as students to respect the range of opinions held in the classroom and to recognize that aspects of every topic we will be discussing are open to debate. In particular, some of the debates we will be discussing pit current scientific understandings against religious viewpoints and personal experiences. The questions we will be asking are **not** questions of what is true, but instead serve as an exploration of the processes by which scientists address questions and reach conclusions, the news media disseminate those conclusions to the public, and both policymakers and members of the public interpret those messages. Although the scientific method represents one means for understanding what is or is not true in the world, it is not the only method through which people reach an understanding of truth. As such, this classroom is **not** a forum for discussing the veracity of any religious beliefs (except perhaps Pastafarianism – see: http://www.venganza.org/), though we may be discussing the *scientific* standing thereof. I will do what I can to keep the discussion within these

bounds – please try to do your part to keep conversation both civil and germane to the topics at hand.

A second point on this general note concerns the readings we will be encountering. In part, this course was designed to showcase aspects of contemporary scientific and political debates. Because this is the case, many of the readings that we will encounter are coupled with strongly held viewpoints. It is impossible that the viewpoints in all of these readings are correct – indeed, you will see that they regularly contradict one-another. A reading's inclusion in the syllabus thus does not represent an endorsement of its content.

Academic Honesty:

A good student-teacher relationship operates on the basis of trust. From that basis, I trust that you will do your utmost to complete course readings and to be honest with me if for any reason you are unable to fully meet a commitment to the class. I also trust your judgment that any collaboration with your peers or additional online research that you do is academically honest. That said, if I encounter evidence that you have in any way shape or form copied material without attribution or collaborated to the point that the work you present is not your own, you will fail the course and I will immediately report the incident to the Dean of Student Affairs.

Additional Resources to Know:

Michigan Association of Communication Studies (MACS)

The Michigan Association of Communication Studies (MACS) is a student organization at the University of Michigan for people who — are communication studies majors, want to be communication studies majors, or are even the slightest bit interested in communication studies and all that it entails. For more information, see macsuofm.com.

Communication Studies Advising

The Communication Studies department offers advising for students who are interested in joining the major or understanding its requirements. Learn more by going to a postered meeting or visiting their website at www.lsa.umich.edu/comm/undergraduate/.

Sweetland Center for Writing

The Sweetland Center for Writing is a comprehensive center for improving student writing at all levels. They offer one-to-one tutoring for undergraduate students. Find them at www.lsa.umich.edu/sweetland/.

Counseling and Psychological Services (CAPS)

Counseling and Psychological Services offers counseling services, educational and preventive initiatives, training programs, outreach and consultation activities, and provide guidance on how to "do something" to fully contribute to a caring healthy community. CAPS can be contacted on their 24-hour crisis line, 734-996-4747 and online at caps.umich.edu.

MiTalk

MiTalk offers mental health resources including online screenings for depression and anxiety, skill-building tools to help you manage stress and academic life, and digitally recorded workshops, lectures, and some relaxation exercises. The site is completely free of charge to U-M Students. Find them at mitalk.umich.edu.

Sexual Assault Prevention and Awareness Center (SAPAC)

If you or someone you know has been harassed, assaulted, or stalked, you can receive confidential support and academic advocacy at the Sexual Assault Prevention and Awareness Center (SAPAC). SAPAC can be contacted on their 24-hour crisis line, 734-936-3333 and online at sapac.umich.edu. Alleged violations can be non-confidentially reported to the Office for Institutional Equity (OIE) at institutional.equity@umich.edu. Reports to law enforcement can be made to University of Michigan Police Department at 734-763-3434.

Course Outline:
(Please note that dates may change as I attempt to confirm times for guest speakers)

Class 1 (Jan 4) - Introduction to the Course

We discuss the expectations for the course, sign-up for group presentations, and watch the beginning of the NOVA documentary on Intelligent Design and Evolution (http://www.pbs.org/wgbh/nova/evolution/intelligent-design-trial.html).

Test Case 1 – Debating Evolution and Intelligent Design

Class 2 (Jan 9) - What is Science?

In *Kitzmiller v. Dover*, the seminal court case on intelligent design (ID), both the proponents of ID and those arguing that only evolution should be taught in schools asked the judge to make a determination on whether or not ID counted as science. But determining what is and isn't science is a notoriously difficult task. This week, we read some of the philosophical literature outlining the search for a "demarcation criterion" – the set of standards whereby scientific endeavors could be distinguished from both dogma (religious beliefs) and pseudo-science (fields like astrology). Karl Popper proposed that science could be distinguished from non-science because science made claims that could be proven wrong. Thomas Kuhn regarded science as a puzzle-solving endeavor, but expressed skepticism that scientific methods could be consistently distinguished from non-science. And Imre Lakatos challenged both notions in portraying science as a constant competition between rival explanations of the world, one that depended on how well theory could predict future results.

> Bird, A. (2011, May 16). Thomas Kuhn (Stanford Encyclopedia of Philosophy/Fall 2009 Edition). Retrieved December 23, 2016, from http://plato.stanford.edu/archives/fall2009/entries/thomas-kuhn/
> *[[Concentrate on sections 2-3]]*
>
> Lakatos, I. (1973, June 30). Science and Pseudoscience Overview and Transcript. Retrieved from http://www.lse.ac.uk/philosophy/department-history/science-and-pseudoscience-overview-and-transcript/
>
> Thornton, S. (2009). Karl Popper (Stanford Encyclopedia of Philosophy/Summer 2009 Edition). Retrieved December 23, 2016, from https://plato.stanford.edu/archives/sum2009/entries/popper/
> *[[Concentrate on sections 2, 3, and 4]]*

Class 3 (Jan 11) – Science, Evolution, and ID

We apply the views of these philosophers to the question of whether both evolution Intelligent Design should count as science. We consider the notion of historical science, as articulated by Gould and the views of philosophers of science to answer this question. We also look at how the question was answered in *Kitzmiller v. Dover.*

Gould, S. J. (1986). Evolution and the Triumph of Homology, or Why History Matters. *American Scientist*, *74*(1), 60–69.

Kitzmiller v. Dover Area School District. (J. E. Jones III, Ed.), 400 F.Supp.2d 707 1–139 (December 20, 2005).
[[Read only pp. 40; 49; 64-83.]]

NO CLASS Jan 16 – MLK Holiday

Class 4 (Jan 18) – Communicating Evolution and ID

Proponents of evolution and those who seek to establish scientific legitimacy for Intelligent Design have learned that the substantive debate happens in the public arena. Because of this public debate on the issue, both camps have strategized about how to shape their messages to the public. This week, we explore those strategies as a way to understand how the communications are crafted.

Labov, J. B., & Kline Pope, B. (2008). Understanding Our Audiences: The Design and Evolution of Science, Evolution, and Creationism. *Cell Biology Education*, *7*(1), 20–24. http://doi.org/10.1187/cbe.07-12-0103

Nisbet, M. C. (2009). Framing science: A new paradigm in public engagement. In *Communicating Science: New Agendas in Communication.* Kahlor, L. and Stout, P. eds. (pp. 40–67). Routledge.
http://doi.org/10.4324/9780203867631

Discovery Institute. (2005). *The Wedge* (pp. 1–10).

Mooney, C., & Nisbet, M. C. (2005). Undoing Darwin: When the coverage of evolution shifts to the political and opinion pages, the scientific context falls away. *Columbia Journalism Review*, 1–3. Retrieved from http://www.cjr.org/issues/2005/5/mooney.asp

*****Find, read, and bring to class one (1) newspaper article, opinion piece, blog posts, or interview transcript that discusses evolution, intelligent design, creationism, or a policy debate related to these issues. (Don't just pick the first one from Google News, look for something unique).***

Class 5 (Jan 23) – Public Perceptions of the Evolution Debate

The communication strategies adopted by evolutionary biologists and those seeking to question the science meet a public that holds largely inconsistent views of evolutionary science. We look at the beliefs of members of the public and discuss both the relevance of these beliefs as well as the impact of the communication strategies on these publics.

Miller, J. D. (2006). Public Acceptance of Evolution. *Science*, *313*(5788), 765–766. http://doi.org/10.1126/science.1126746

Plutzer, E., & Berkman, M. (2008). Trends Evolution, Creationism, and the Teaching of Human Origins in Schools. *Public Opinion Quarterly*, *72*(3), 540–553. http://doi.org/10.1093/poq/nfn034

Giberson, K. (2006). Guest Editorial: Say It Ain't So: America's Continued Rejection of Evolution. *Applied Developmental Science*, *10*(3), 116–120. http://doi.org/10.1207/s1532480xads1003_1

Class 6 (Jan 25) – When Religion and Science Conflict

Why don't some people believe what the vast majority of scientists assert? The answer, at least in the case of evolutionary biology, is that many people hold other beliefs that challenge scientific claims. We explore the role of religiosity as a source of countervailing beliefs, along with the notions of motivated reasoning and its close cousin cultural cognition.

Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, *14*(2), 147–174. http://doi.org/10.1080/13669877.2010.511246

Roos, J. M. (2014). Measuring science or religion? A measurement analysis of the National Science Foundation sponsored science literacy scale 2006–2010. *Public Understanding of Science*, *23*(7), 797–813. http://doi.org/10.1177/0963662512464318

Class 7 (Jan 30) – The Political Classroom

The polarized public perceptions of evolutionary science and its purported alternatives lead to an unusual battleground: public school science class. Because biology is a standard topic in school and evolution is among the most central theories of biology, science teachers and textbook writers feel compelled to present evolutionary theory as a central concept. But because education is determined by

local and state school boards that are comprised of non-scientists, public beliefs can easily enter the landscape.

Berkman, M. B., Pacheco, J. S., & Plutzer, E. (2008). Evolution and Creationism in America's Classrooms: A National Portrait. *PLOS Biology*, *6*(5), e124. http://doi.org/10.1371/journal.pbio.0060124

Moore, R. (2001). The Lingering Impact of the Scopes Trial on High School Biology Textbooks. *BioScience*, *51*(9), 790–796. http://doi.org/10.1641/0006-3568(2001)051[0790:TLIOTS]2.0.CO;2

Collins, G. (2012, June 21). How Texas Inflicts Bad Textbooks on Us. *New York Review of Books.* Retrieved January 3, 2017, from http://www.nybooks.com/articles/2012/06/21/how-texas-inflicts-bad-textbooks-on-us/

Class 8 (Feb 1) – Law as a Policy Implementation [DISCUSSION DAY]

Although public policy about science is born in the classroom, it is often reconciled in the courts. Here we look at how the first Amendment blocked the teaching of intelligent design and what that portends for the future of evolution in schools. We consider how reasonable it is to use the law as a way to dictate what science is and what it isn't.

Kitzmiller v. Dover Area School District. (J. E. Jones III, Ed.), 400 F.Supp.2d 707 1–139 (December 20, 2005).
[[Skim all unread sections]]

Rosenau, J. (2009). Leap of Faith: Intelligent Design's Trajectory after Dover. *University of St. Thomas Journal of Law and Public Policy*, *4*(1).

*****First Student-Led Discussion Day***

Test Case 2 – Climate Change

Class 9 (Feb 6) – The Science of Climate Change

Climate models are notoriously complex. They involve a large number of parameters covering the entire earth. This means that, although there is a large-scale consensus on the basic expectations of climate change, there is considerable uncertainty about

both the rate at which the climate would be expected to change and the parameters that comprise the key models.

IPCC - Intergovernmental Panel on Climate Change. (2013). Summary for Policymakers of the Synthesis Report of the IPCC Fifth Assessment Report. In T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, et al. (Eds.), *Climate Change The Physical Science Basis* (pp. 3–29). New York.

Allen, M. R., Stott, P. A., Mitchell, J. F. B., Schnur, R., & Delworth, T. L. (2000). Quantifying the uncertainty in forecasts of anthropogenic climate change. *Nature*, *407*(6804), 617–620. http://doi.org/10.1038/35036559

Oreskes, N. (2004). The Scientific Consensus on Climate Change. *Science*, *306*(5702), 1686–1686. http://doi.org/10.1126/science.1103618

*** Likely Guest Speaker Eric Kort on this Date**

Class 10 (Feb 8) – The Challenge of Uncertainty

Uncertainty is not the source of catchy headlines. Yet uncertainty is a key piece of the climate science puzzle. One of the core challenges in convincing a skeptical public about the dangers of climate change is the difficulty of communicating that a science with highly uncertain measures can still yield a confident conclusion. This week we dig into the challenges of presenting uncertain science to the public.

Stocking, S. H. (2011). How Journalists Deal with Scientific Uncertainty. In S. M. Friedman, S. Dunwoody, & C. L. Rogers (Eds.), *Communicating Uncertainty* (pp. 23–41). Mahwah, NJ.

Zehr, S. C. (2000). Public representations of scientific uncertainty about global climate change. *Public Understanding of Science*, *9*(2), 85–103. http://doi.org/10.1088/0963-6625/9/2/301

*****Find, read, and bring to class three (3) newspaper articles, opinion pieces, blog posts, or interview transcripts that discuss climate change, global warming, or a policy debate related to these issues. (Don't just pick the first ones from Google News, look for something unique).***

Class 11 (Feb 13) – Journalistic Norms

Beyond the challenge of reconciling scientific uncertainty with news goals, norms of journalism can also distort the way science news is reported. This week, we explore some of those journalistic norms and look at how typical journalistic practices have

served to obfuscate messages about the presence, severity, and causes of climate change.

Bennett, W. L. (1996). An Introduction to Journalism Norms and Representations of Politics. *Political Communication*, *13*, 373–384.

Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study of US mass-media coverage, *38*(6), 1190–1204. http://doi.org/10.1016/j.geoforum.2007.01.008

Class 12 (Feb 15) – Communicating Climate Science

Part of the challenge of presenting news about climate change is that there are really two issues subject to discussion. One of them stems from the science and the other stems from the public policy that is relevant to that science. Journalists navigate a complex divide between these two different narratives, with different levels of contention and topics of worthy debate.

Nisbet, M. C. (2009, February 11). Communicating Climate Change. *Environment*, *51*(2), 12–23.

Corbett, J. B., & Durfee, J. L. (2004). Testing Public (Un)Certainty of Science: Media Representations of Global Warming. *Science Communication*, *26*(2), 129–151. http://doi.org/10.1177/1075547004270234

Class 13 (Feb 20) – A Partisan Gap

Between the 1970s and today, climate change in particular and environmentalism in general has shifted from a nonpartisan issue to a deeply partisan one. Because partisanship is such an important force in defining how people interpret the contemporary world, increasing evidence suggests that people respond to survey questions about climate change through an increasingly partisan lens. This makes it difficult to understand the central dynamics driving public opinion and shifts the debate from one about the science to one that maps onto strongly held partisan identities.

McCright, A. M., & Dunlap, R. E. (2011). The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001–2010. *The Sociological Quarterly*, *52*(2), 155–194. http://doi.org/10.1111/j.1533-8525.2011.01198.x

Kahan, D. M. (2015). Climate-Science Communication and the Measurement Problem. *Advances in Political Psychology*, *36*(S1), 1–43. http://doi.org/10.1111/pops.12244

Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2013). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, *23*(7), 0963662513480091–883. http://doi.org/10.1177/0963662513480091

Class 14 (Feb 22) – Motivated Reasoning

The individuals who reject scientific conclusions do not do so out of some form of malice, but rather because they hold identities and beliefs that contradict that consensus. We explore how these sorts of motivations, including biased information seeking and belief updating, can result in diverging perceptions across the population.

Pasek, J. (Revised and Resubmitted to Public Understanding of Science). It's Not My Consensus: Motivated Reasoning and the Sources of Scientific Illiteracy.

Zhao, X. (2009). Media Use and Global Warming Perceptions: A Snapshot of the Reinforcing Spirals. *Communication Research*, *36*(5), 698–723. http://doi.org/10.1177/0093650209338911

Class 15 (Mar 6) – The Psychology of Acceptance / Backfire

When ordinary individuals receive information about climate science, sometimes they update their beliefs and sometimes they reject the information they are given. These readings explore the processes by which the acceptance and rejection can happen, with particular interest in a pernicious form of rejection – that of backfiring responses or boomerang effects.

Feinberg, M., & Willer, R. (2011). Apocalypse Soon?: Dire Messages Reduce Belief in Global Warming by Contradicting Just-World Beliefs. *Psychological Science*, *22*(1), 34–38. http://doi.org/10.1177/0956797610391911

Hart, P. S., & Nisbet, E. C. (2012). Boomerang Effects in Science Communication: How Motivated Reasoning and Identity Cues Amplify Opinion Polarization About Climate Mitigation Policies. *Communication Research*, *39*(6), 701–723. http://doi.org/10.1177/0093650211416646

Class 16 (Mar 8) – Legitimate Political Debates? [DISCUSSION DAY]

The presence of a scientific consensus is fundamentally different from that of a political will. These readings explore how the scientific messages interact with political goals and objectives to inform (or fail to inform) policy.

Luntz, F. (2002). *The Environment: A Cleaner Safer, Healthier America*. [Memo to the Bush Administration]

Pizer, W. A. (1999). The optimal choice of climate change policy in the presence of uncertainty. *Resource and Energy Economics*, *21*(4), 255–287. http://doi.org/10.1016/S0928-7655(99)00005-6

van den Hove, S., Le Menestrel, M., & de Bettignies, H.-C. (2002). The oil industry and climate change: strategies and ethical dilemmas. *Climate Policy*, *2*(1), 3–18. http://doi.org/10.3763/cpol.2002.0202

*****Second Student-Led Discussion Day***

Test Case 3 – Vaccines and Autism

Class 17 (Mar 13) – The Vaccine Scare

Before the 1940s, nobody had ever heard of autism. Today, it is considered one of the world's most pervasive and problematic developmental disorders; scientists estimate that it afflicts between 1 in 200 and 1 in 50 individuals. But what was this newly pervasive disease? And was its prevalence really growing or were we just paying attention to something that we hadn't been aware of previously? In the early 1990s and even through the present day, research on autism raised as many questions as had been answered. Indeed, scientists still disagree on whether the disorder is spreading or simply better diagnosed. And if autism is indeed an epidemic, then something must be causing its increased prevalence. For many parents in particular, the silver bullet seemed to be vaccinations. Children were receiving more and more vaccines, and autism seemed to kick in shortly thereafter. This week's readings show the state of the science when the vaccine hypothesis entered the literature and how parents regarded that science.

Wakefield, A. J., Murch, S. H., Anthony, A., Linnell, J., Casson, D. M., Malik, M., et al. (1998). Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *The Lancet*, *351*(9103), 637–641.
[Skim]

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.

[Chapters 1-2 and 7]

Class 18 (Mar 15) – Refuted Science

Increasing diagnoses of autism and the perception that vaccines might be responsible led to a flurry of research on the potential for a link between autism and either the MMR vaccine or the vaccine preservative thimerosal. A large number of studies emerged in the early 2000s disputing the purported links. Further, the Wakefield et al. study was redacted from *Lancet*, after some evidence suggested both a conflict of interest and potentially falsified data. But what influence did this have on both the discourse and on the public? This week's readings explore how new scientific evidence entered the debate and what influence that had on the actors in play.

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.
[Chapters 3-5]

Taylor, L. E., Swerdfeger, A. L., & Eslick, G. D. (2014). Vaccines are not associated with autism: An evidence-based meta-analysis of case-control and cohort studies. *Vaccine*, *32*(29), 3623–3629.
http://doi.org/10.1016/j.vaccine.2014.04.085

Class 19 (Mar 20) – Reflecting Which Debate?

Media coverage about autism, when connected to vaccines, is rarely simply about the research. Instead, journalistic norms lead many to cover the question as a debate. This has also been furthered in attempts to cover political hearings on the purported relations between vaccines and autism. We discuss how this coverage altered the narratives about the effects of vaccines and what these messages may have meant for caregivers.

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.
[Chapters 6 and 9]

Evans, M., Stoddart, H., Condon, L., Freeman, E., Grizzell, M. and Mullen, R. (2001) Parents' Perspectives on the MMR Immunisation: A Focus Group Study. *British Journal of General Practice, 51*, pp. 904-910.

Clarke, C. E., Dixon, G. N., Holton, A., & McKeever, B. W. (2014). Including "Evidentiary Balance" in News Media Coverage of Vaccine Risk. *Health Communication*, *30*(5), 461–472.
http://doi.org/10.1080/10410236.2013.867006

*****Find, read, and bring to class two (2) newspaper articles, opinion pieces, blog posts, or interview transcripts that discusses vaccine safety or a policy debate related to these issues. (Don't just pick the first ones from Google News, look for something unique).***

Class 20 (Mar 22) – Overcoming False Causal Attributions

Communicating around the claims of the vaccinations and autism movement has proven a steep challenge. Here, we look at a number of attempts to address these challenges as well as some of the cognitive processes that can complicate effective messaging.

Holton, A., Weberling, B., Clarke, C. E., & Smith, M. J. (2012). The Blame Frame: Media Attribution of Culpability About the MMR–Autism Vaccination Scare. *Health Communication*, *27*(7), 690–701. http://doi.org/10.1080/10410236.2011.633158

Mnookin, S. (2011) *The Panic Virus: A True Story of Medicine, Science, and Fear*. Simon and Schuster: New York.
[[Chapter 16, "Cognitive Biases and Availability Cascades"]]

Nyhan, B., Reifler, J., Richey, S., & Freed, G. L. (2014). Effective Messages in Vaccine Promotion: A Randomized Trial. *Pediatrics*, *133*(4), peds.2013–2365–e842. http://doi.org/10.1542/peds.2013-2365

Class 21 (Mar 27) – Special Interest Politics and Social Movements

From a public policy perspective, the value of vaccinations almost certainly outweighs the risks. In particular, the notion of herd immunity means that diseases can be eliminated from society if and only if a sufficient number of individuals are willing to undergo vaccination. But the politics of universal vaccination are far less certain. Sizable interest groups can challenge the politicians who seem to ignore their fears. This week we look at the way policymakers navigate the dangerous waters between public uncertainty and optimal policy decisions for society. We also explore how a bunch of parents became a force in altering how the current debate is proceeding.

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.
[Chapters 8 & 10]

Kerr, M. A. (2009, August 6). *The Autism Spectrum Disorders / Vaccine Link Debate*: A Health Social Movement. [Unpublished Dissertation]. Pittsburgh, PA: University of Pittsburgh.
[Read pages 1-3, 208-214]

Pitney, J. J. (2010). Autism Politics: A Research Agenda (pp. 1–37). Presented at the Annual Meeting of the Midwest Political Science Association, Chicago, IL.

Class 22 (Mar 29) – Is First Cut Science Doomed to Live Forever? [DISCUSSION DAY]

Despite consistent refutation from the scientific community, perceptions that vaccines cause autism continue to abound. In the confluence of Wakefield and misleading media coverage, claims of a vaccine autism link remain doggedly persistent. We discuss whether media reporting on conflicted science will inevitably lead to these muddy waters or whether it is possible to provide a definitive answer after the debate that has ensued.

Ratzan, S. C. (2010). Setting the Record Straight: Vaccines, Autism, and the Lancet. *Dx.Doi.org*, *15*(3), 237–239.
http://doi.org/10.1080/10810731003780714

Offit, P. A. (2010) *Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure*, Columbia University Press: New York.
[Epilogue]

*****Third Student-Led Discussion Day***

When Science Is Not Settled

Class 23 (Apr 3) – Can Neutrinos Travel Faster Than Light?

In 2011, scientists at Gran Sasso National Laboratory in Italy found evidence in their data that Neutrinos were travelling faster than the speed of light. If true, this would violate one of the core provisions of Einstein's special relativity and would thus likely indicate the emergence of a "new physics." We discuss what happened following this event both in the science and the media.

McLaughlin, B. (2011, September 26). Neutrinos and the Speed of Light — A Primer on the CERN Study. *Wired*.

Stephens, R. (2015, May 7). The Faster-Than-Light Neutrinos That Weren't: The Data That Threatened to Break Physics. *Nautilus*, (024).

Strassler, M. (2012, April 2). OPERA: What Went Wrong | Of Particular Significance. Retrieved January 1, 2017, from https://profmattstrassler.com/articles-and-posts/particle-physics-basics/neutrinos/neutrinos-faster-than-light/opera-what-went-wrong/

*****Find, read, and bring to class one (1) newspaper article, opinion piece, blog posts, or interview transcript that discusses this science. (Don't just pick the first one from Google News, look for something unique).***

Class 24 (Apr 5) – Is Precognition Real?

Also in 2011, psychologist Daryl Bem published a paper in a top psychology journal that suggested that humans could perform slightly better than chance at predicting events in the future. This evidence for what parapsychologists called "psi" was a shocking claim, but the evidence appeared strong. We explore how this incident played out in both the science and in the media as well.

Bem, D. J. (2011). Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. *Journal of Personality and Social Psychology*, *100*(3), 407–425. http://doi.org/10.1037/a0021524

Ritchie, S. J., Wiseman, R., & French, C. C. (2012). Failing the Future: Three Unsuccessful Attempts to Replicate Bem's 'Retroactive Facilitation of Recall' Effect. *PLoS ONE*, *7*(3), e33423. http://doi.org/10.1371/journal.pone.0033423

*****Find, read, and bring to class one (1) newspaper article, opinion piece, blog posts, or interview transcript that discusses this science. (Don't just pick the first one from Google News, look for something unique).***

Class 25 (Apr 10) – From the Politics of Science to the Politicization of Science

In reading through the literature on the nature of science, the communication of science messages to the public, the formation of public opinion, and the development of policy, we have seen how science can play a variety of different roles in public opinion and politics. Yet the story remains critically lacking. Not only do scientific findings have the capacity to alter political realities, but political decisions can shape science itself. This week we explore the foundations of scientific questions. In particular, we focus on the notion of social constructivism. Science could be said to be socially constructed if there was nothing inherently natural about the way science progresses or the questions scientists ask. To the

extent that science is a social construct, the outcomes of science might be strongly shaped by the questions researchers pose. If the funders of science or the practitioners of science pose questions with political motivations, what might that do to the end results of the scientific process?

Berube, M. (2011). The Science Wars Redux. *Democracy*, *Winter 2011*(19), 64–74.

Hacking, I. (2000). What About the Natural Sciences? In *The Social Construction of What* (pp. 63–99). Cambridge, MA: Harvard University Press.

Davenport, C. (2016, December 9). Climate Change Conversations Are Targeted in Questionnaire to Energy Department. *New York Times*.

Class 26 (Apr 12) – Challenges for the Future / Presentations

From afar, we tend to think that science represents the relentless pursuit of knowledge from an objective viewpoint. As we look closer and closer at scientific findings and the political process the story becomes considerably messier. Scientists may work to reduce the uncertainty in our knowledge of the world, but they can never conclusively prove or disprove anything. Oftentimes, as we have seen, scientific insights serve to muddy the waters more than to teach us about the world. Further, by the time those insights are filtered through the news media and public opinion, they may bear little resemblance to their former selves. This week, we think more broadly about uncertainty and the public understanding of science. What is to be done . . . if anything at all?

Gauchat, G. (2012). Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010. *American Sociological Review*, *77*(2), 167–187. http://doi.org/10.1177/0003122412438225

Jamieson, D. (1996). Scientific Uncertainty and the Political Process. *The ANNALS of the American Academy of Political and Social Science*, *545*, 35–43. http://doi.org/10.2307/1047890?ref=search-gateway:ea511a48cde012d2a80788644de74be0

Specter, M. (2010). Denialism. New York: Penguin Books. [Chapter 1]

Class 27 (Apr 17) – Presentations / A Final Discussion

NO NEW READINGS