SYLLABUS

Communication 448 & 548
ISSUES IN SCIENCE & ENVIRONMENTAL COMMUNICATION
Undergraduate, Post-graduate, Honors & Graduate students
Portland State University

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Drop-in Hours: INSERT

Course Description

How do we know what we know?

The course examines public discourse concerning science, health, the environment and risk, and we ask the question: "How do we know what we know?"

The key objective of the course is to address the question by exploring the following dimensions of the communication process in the context of science, health, the environment and risk:

1. Who are stakeholders and what are their interests?
2. How and which information channels are used?
3. How are messages framed?
4. What are the effects of communication?

We will look at issues ranging from childhood vaccines to the unearthing of ancient skeletons, and students investigate their own case study that addresses the questions above.

Overview

We will study how messages and meanings are framed in arenas of discourse, asking:

- How do mass media tell stories about science, health, the environment and risk?
- How is science practiced and legitimized?
- What are cultural and ethical responses to scientific paradigms and norms?
- How do messages focus on some issues while avoiding others?
- Why do some messages resonate while others founder?
- Who sets the agenda on science, health, the environment and risk issues?
- How do various publics respond, perceive and judge information?

Details Readings, viewings, discussions, activities and assignments are geared to address how discourse can help us understand the four dimensions (above) regarding the communication process.

Consider the example of **childhood vaccines**. In class, we will start by reading Andrew Wakefield and his colleagues' research into effects of the measles, mumps and rubella vaccine, published in a peer-reviewed journal in 1998. We will tackle the four key questions, such as: *what are interests the stakeholders may have had in the research*, by looking at the peer-reviewed research article, the researchers themselves, the makers and sellers of the vaccines, and other invested publics. We then explore information channels, asking, how was the research communicated in the journal and in subsequent news coverage? We will dig into message framing by critically examining the *Lancet* manuscript (which was redacted in 2010), news articles, and other discourse on the topic of the Wakefield study, vaccines, and other issues that arise. Finally, we will look for evidence of possible effects of discourse by examining public opinion polls, vaccination rates, measles, and other outbreaks, and instances that speak to effects on lay publics and scientific publics.

Readings Required readings include one book, several peer-reviewed scholarly articles, news articles, videos and various handouts.

Daniel Kahneman's best-seller, *Thinking, Fast and Slow*, sets the stage for how we think about creating meaning—from rational and non-rational perspectives. Kahneman helps us explore how we think, and how such thinking affects how judgments are produced—in scientific and in lay circles alike. The book helps us examine the central question: *How do we know what we know?*

The complete reading list is available on the course website.

Diverse Perspectives Views on science, health, the environment and risk vary widely, and we will think about assumptions we make when knowledge systems clash across regions and cultures. We will examine the case of Kennewick Man as an exemplar that illuminates Native American "ways-of-knowing." The ancient bones of Kennewick Man were uncovered in the Pacific Northwest in 1996, and resulted in a 21-year struggle over who gets to decide how the bones will be studied, preserved and honored.

Learning Outcomes A learning outcome refers to what an instructor wants students to learn. For our class, learning outcomes are tied to course objectives. That is, how can we better understand the question, *How do we know what we know?* We use readings, discussions and written assignments to explore how four dimensions of the communication process inform publics: What are stakeholder interests? How and which information channels are used? How are messages framed? What are the effects of communication?

For example, we can apply the case study of childhood vaccines and the Wakefield study to ask how stakeholder interests, information channels, messages, and communication effects inform "how we know." As a student, your ability to address the questions critically reflects your learning. Your learning will be assessed (determined and measured) by evaluation of your assignments.

Assignments

Assignments are designed to meet the Learning Outcomes (above):

- Attendance and class participation (10%)
- Homework & abstracts (30%)
- Case Study Paper 1 (30%)
- Case Study Paper 2 (30%)

Specifics Details for each assignment are available on the course website. Requirements for undergraduate students differ from graduate, postgraduate and honors students. NOTE: Read thoroughly the requirements for each assignment and bring questions to class before they are due.

Students with Disabilities

Portland State values diversity and inclusion and is committed to fostering mutual respect and full participation for all students.

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Policy & Practice

Late assignments are not accepted. Deadlines are given the first week of class, and noted in the course materials, to give you ample time. Your written work will be error-free and written in excellent English grammatical style. Our Department uses APA (American Psychological Association) style for papers and citations.

Courses and professors vary, so carefully review the grading assignments for each paper, homework and projects.

All assignments must be turned in via two formats: one copy **online** (through the course website platform) on the due date and on time, and one copy **in person** (in hard-copy form) on the due date and on time.

To ensure robust fairness in grading, **always use your student ID** on your assignments, even when they are uploaded on the course website

Grading is based on requirements in the assignment instructions. In the rare case when a grade is disputed, students must deliver a written report with justification to the professor within one week's time.

Ethical Issues

You are invited to discuss the class with fellow students, **but all of your written materials turned in for a grade—homework, papers, assignments—must be created and written by you *alone*.** There are no group assignments or group grades.

You may never hand-in homework that has been written by a group of students or by someone else or for another class. All papers, tests, homework and other assignments turned in for a grade must be the result of **your original work** *in this class* specifically. You are *not* permitted to hand in an assignment you wrote for another class. Similarly you are not permitted to use assignments from this class for any other class.

We use special software to check online for plagiarism. The software will indicate when you have copied materials—whether for another class or lifted from another source. Take great care to cite material written by someone else.

It is essential you understand that any work written by someone else—whether spoken, broadcast, obtained on the internet, found in scholarly journals, uncovered in magazines, or located within texts—cannot be reproduced in your name without attending to copyright, fair use, and citation standards followed in scholarly research (see the APA Manual). **Do not use any information from a source unless you have properly reported and cited the source.** Students who use other people's work as their own will be reported to the Dean of Student Life. Discovery of plagiarism or cheating will result in a grade of zero. *Whether or not you are familiar with these standards, you are still responsible for using them.*

BE COURTEOUS

YOU DISTRACT CLASSMATES WHEN YOU ARRIVE LATE OR LEAVE EARLY

& WHEN YOU USE YOUR PHONES, TABLETS & COMPUTERS

AVOID DISTRACTIONS

Please: NO EATING, NO TEXTING, NO DISTRACTIONS

Learning Environment

Your learning is paramount. Please take great care to avoid disruptions that affect someone else's learning. Interruptions—such as arriving late, leaving early and interrupting lectures by walking through the classroom—create distractions. Using cell phones, computers and tablets distract you and distract others.

Eating food in the presence of others is also distracting. Please: no food, no coming-and-going, and no electronics [exceptions are allowed for students who require accommodation approved by the campus' Disabilities Resource Center].

Graduate & Undergraduate Students

The course is designed for senior and honors undergraduate students and postgraduate and graduate students of all majors. Prerequisite is Comm311 or another (instructor-approved) research methods course.

Each week, graduate students (Comm548) lead small group discussions with undergraduate, post-graduate and honors students, in preparation for all-class discussion. Note, however, that graduate students are not expected to have more knowledge about the course topic than other students, and their role is to engage students and keep the conversation lively.

All students will write two case study papers. Each case study focusses on a topic in science, health, the environment and risk that has been covered in the popular press *and* in a scientific, peer-reviewed journal. Undergraduate students—*except honors students*—will describe, analyze and compare-and-contrast the narratives in the popular press (news) and in scientific journals. Graduate, postgraduate and honors students will take their papers deeper and broader. In addition to describing, analyzing and comparing-contrasting lay and scientific coverage of an issue, you will provide readers will a context for the larger social perspective of the case study. For example, when Andrew Wakefield and colleagues' study on the relationship of vaccines, gastrointestinal problems and autism was published in 1998, how did the public climate of opinion influence the response to news coverage of the study in the UK and US? What pertinent theories from the field of communication can help explain public reaction? How does the structure of the news process lend itself to the ways in which the story was treated in the popular press? In summary, you will critique the information landscape of the topic by extending your interrogation into the social and cultural structures that have an impact on the issue. (Details are available in the case study assignment sheet on the course webpage).

Grading

Grading is based on a 1000-point scale:

Assignment	Points	Percentage
Attendance & Participation	100	10%
Homework	300	30%
Case Study Paper 1	300	30%
Case Study Paper 2	300	30%
	1000 points	100%

Final Grading Assessment (course is letter-graded)

A range	940-1000 points (includes A-minus through A)
B range	820-939 (includes B-minus, B and B+)
C range	720-819 (includes C+ and C)
C-range	699-719 (C-minus)
D range	659-698 (include D+, D and D-minus)
F range	below 658

Professor Coleman

Cynthia-Lou Coleman writes and lectures about how scientific information is deployed in mass media and public discourse, and she avidly pursues topics that affect Indigenous peoples in North America. She examines the tug-of-war among scientists and Native tribes over fishing rights, mine construction on tribal lands, and repatriation of remains such as the 9200-year-old skeleton, Kennewick Man. Her new book, *Environmental Clashes on Native American Land: Examining Cultural Ruptures through Social Discourse*, will be published by Palgrave-Macmillan in 2019. Professor Coleman writes regularly for scholarly and popular press, including her blog, *Native Science*, and is an associate editor for the journal *Science Communication*. She earned advanced degrees in communication from Cornell University and the University of Wisconsin-Madison, and has held fellowships at the US Centers for Disease Control and Prevention, and at the Smithsonian's National Museum of the American Indian. In addition to teaching science communication, Coleman teaches courses in propaganda, communication theory, and research methods.

Weather & Hazards

Portland State University may close or delay classes if weather and other conditions warrant.

INSERT STATEMENT REQUIRED BY THE OFFICE OF ACADEMIC AFFAIRS

Campus Resources

Portland State University policies for creating a safe environment are available for your perusal at the *Creating a Safe Campus* module, located here.

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WEEKLY READINGS SCHEDULE

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Week 1 **How Do We Know What We Know? *Introduction***
Epistemology, Ontology, Science, Environment, Biopolitics, and the Practice of Science

DUE TODAY

- Kahneman, first 4 chapters, pp. 1-58
- Bring to the first class at least one example of a recent news story from a popular publication, broadcast or internet source (aimed at a general audience) that refers to a scientific study (bring a hard copy for class discussion). Choose an article based on a study that you can also find: anything about science from The New York Times, the Oregonian, Fox News, The National Enquirer…. something to talk about. In a recent example, The New York Times ran an article in October 2016 that claimed in the headline, "Why Big Liars Often Start Out as Small Ones." The article is based on a journal article in Nature Neuroscience that suggests "the brain adapts to dishonesty" (Garrett et al., 2016)

DUE NEXT WEEK

- Kahneman Part I, "Two Systems," chapters 1-9 (pp. 1- 105) and complete Homework-Abstracts
- Read the Foucault Power & Knowledge (Two Lectures) (see D2L) and complete Homework-Abstracts

Week 2 **What Informs Us: Heuristics & Mass Media**
Revisit Epistemology, Ontology, Science, Environment, Biopolitics, and the Practice of Science

DUE TODAY
HOMEWORK-ABSTRACTS

- Kahneman Part I Homework-Abstracts
- Foucault Two Lectures Homework-Abstracts
- Select Case Study topic

FOR TODAY'S DISCUSSION

- See http://www.sciencemediacentre.org/ and be prepared to discuss: what is this website? Who are the audiences?
- Find a website or blog to share with the class that focuses on an issue that interests you in science, environmental, health or risk communication. For an example of a website see Science Media Centre (above) and for a blog example see https://nativescience.blog/ bring your own ideas and interests to class
- Find *another* example of a news story from a popular publication, broadcast or internet source (aimed at a general audience) that refers to a scientific study. Find and get a copy of the original study (required—you cannot complete the ensuing assignment without the original study). Be prepared to discuss

- Find “Science Communication” at the PSU Library website. Go to the database headings and look for “Communication Resources.” Within that section you will find **Oxford Bibliographies**, and then search for “Science Communication.” What do you discover?

DUE NEXT WEEK
- Load Case Study topic onto class webpage for discussion
- Foucault Right of Death and Power over Life Homework-Abstracts
- Biopolitics article by Coleman & Ritchie, 2011 Homework-Abstracts

Week 3 **Communication, Heuristics & Biases**
Heuristics, Spiral of Silence, Third Person Effect, Optimistic Bias

DUE TODAY
- Foucault Right of Death and Power over Life Homework-Abstracts
- Biopolitics article by Coleman & Ritchie, 2011 Homework-Abstracts
- Review & make notes from the Spiral of Silence theory on the University of Twente (Netherlands) website on “Overview of Communication Theories,” under the Mass Media heading: https://www.utwente.nl/cw/theorieenoverzicht/
- Review Spiral of Silence and Third Person Effect theory at the PSU Library website. Go to the database headings and look for “Communication Resources.” Within that section you will find **Oxford Bibliographies**, and then search for “Third Person Effect” and “Spiral of Silence”—where are they located in the database [under what heading(s)]? What is spiral of silence?

DUE NEXT WEEK
- Kahneman Part II, “Two Systems,” chapters 10-18 Homework-Abstracts
- Read Hayes et al. on Spiral of Silence Homework-Abstracts
- Spiral of Silence and Third Person Effect notes

Week 4 **Communication, Heuristics & Biases**
Heuristics, Spiral of Silence, Third Person Effect, Optimistic Bias

DUE TODAY
- Kahneman Part II, “Two Systems,” chapters 10-18 Homework-Abstracts
- Read Hayes et al. on Spiral of Silence Homework-Abstracts
- Review Spiral of Silence and Third Person Effect (online

DUE NEXT WEEK
- Case Study Paper 1

Week 5 **Case Studies**

DUE TODAY
- Case Study Paper due online before class
- Hard copy due at the start of class
- Oral presentation of papers (undergraduates & honors students) with handout

Discussion & Post-mortem on case studies

DUE NEXT WEEK
- Lehrer, 2010, "The Truth Wears Off" Homework-Abstracts

- Fernbach & Sloman, "Why we believe obvious untruths" (about ignorance and adaptation) Abstracts
- Kolbert, "Why facts don't change our minds" (about Sloman & Fernbach's thesis) Abstracts due

Week 6 **Facts, truths and untruths**

Discussion on facts, truths and untruths

DUE TODAY
HOMEWORK-ABSTRACTS

- Lehrer, 2010, "The Truth Wears Off" Homework-Abstracts
- Fernbach & Sloman, "Why we believe obvious untruths" (about ignorance and adaptation) Homework-Abstracts
- Kolbert, "Why facts don't change our minds" (about Sloman & Fernbach's thesis) Homework-Abstracts

DUE NEXT WEEK

- Watch: 12 minutes on research findings https://www.youtube.com/watch?v=42QuXLucH3Q
- Watch: 5 minutes from Ioannidis https://www.youtube.com/watch?v=KOZAV9AvIQE

- Beck, 2010 Homework-Abstracts
- Ioannidis, 2005 Homework-Abstracts
- SKIM & NOTE Eklund et al., 2016, “Cluster Failure…”
- SKIM & NOTE Crew, 2016, “A bug in fMRI software…”
- And 2 short videos (see above)

Week 7 **The Brain**

Guest speaker: OHSU Neurologist

DUE TODAY

- Beck, 2010 Homework-Abstracts
- Ioannidis, 2005 Homework-Abstracts
- Eklund et al., 2016, “Cluster Failure…” Notes
- Crew, 2016, “A bug in fMRI software…” Notes
- And 2 short videos (see above)

DUE NEXT WEEK

- Wakefield et al., 1987 Homework-Abstracts
- Nyhan et al., 2014 Homework-Abstracts
- Wiegold, 2001 Homework-Abstracts
- Logan, 2001 Homework-Abstracts

Week 8 **Vaccines and Communication Theories in Science**

DUE TODAY

- Wakefield et al., 1987 Homework-Abstracts
- Nyhan et al., 2014 Homework-Abstracts
- Wiegold, 2001 Homework-Abstracts

- Logan, 2001 Homework-Abstracts

DUE NEXT WEEK

- View the documentary, "Merchants of Doubt," (2104) available on internet streaming sources [Check the PSU Library]
- Bieder, 1996, Representations of Indian Bodies Homework-Abstracts
- Wakeham, 2008 (selection from "Taxidermic Signs") Homework-Abstract
- Coleman, 2012, Kennewick Man

Week 9 **Environmental Communication**

DUE TODAY

- View the documentary, "Merchants of Doubt," (2104) available on internet streaming sources [Check the PSU Library]
- Bieder, 1996, Representations of Indian Bodies Homework-Abstracts
- Wakeham, 2008 (selection from "Taxidermic Signs") Homework-Abstract
- Coleman, 2012, Kennewick Man

DUE NEXT WEEK

- Case Study Paper 2
- Kahneman Part III and [from Part IV]: Prospect Theory, Risk Policies, Frames & Reality Homework & Abstracts

Week 10 **Wrap-up**

How do we know what we know? How do we create meaning?
See information about the "Chocolate Study"

- http://www.dailymail.co.uk/femail/article-3018945/New-study-reveals-eating-chocolate-doesn-t-affect-Body-Mass-Index-help-LOSE-weight.html
- http://www.roymorgan.com/findings/6155-easter-perfect-excuse-to-eat-chocolate-201503302159
- http://io9.gizmodo.com/i-fooled-millions-into-thinking-chocolate-helps-weight-1707251800
- http://www.npr.org/sections/thesalt/2015/05/28/410313446/why-a-journalist-scammed-the-media-into-spreading-bad-chocolate-science
- https://www.sciencenews.org/blog/culture-beaker/attempt-shame-journalists-chocolate-study-shameful

DUE TODAY

- Case Study Paper due online before class
- Hard copy due at the start of class
- Oral presentation of papers (undergraduates)
- Kahneman Homework-Abstracts
- Course evaluations

B I B L I O G R A P H Y

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Prof. C. Coleman

Alberts, Bruce (2009). Redefining Science Education. *Science*, 323(5913), p. 437

Beck, Diane M. (2010). The Appeal of the Brain in the Popular Press. *Perspectives on Psychological Science*, 5(6): 762-766

Bieder, R.E. (1986). Science Encounters The Indian, 1820-1880: The Early Years of American Ethnology. Norman, Oklahoma: The University of Oklahoma Press

Coleman, Cynthia-Lou (2013). The Extermination of Kennewick Man's Authenticity through Discourse. *Wicazo Sa Review,* 28(1): 65-76

Coleman, Cynthia-Lou and L. David Ritchie (2011). Examining Metaphors in Biopolitical Discourse. *Lodz Papers in Pragmatics*, 7(1): 29-59

Crew, Bec (2016). A Bug in fMRI Software Could Invalidate 15 Years of Brain Research. Available at www.sciencealert.com/a-bug-in-fmri-software-could-invalidate-decades-of-brain-research-scientists-discover

Eklund, Anders, Thomas E. Nichols, and Hans Knutsson (2016). Cluster Failure: Why fMRI Inferences for Spatial Extent Have Inflated False-Positive. *PNAS* 113(28): 7900-7905

Fernbach, Philip and Steven Sloman (2017, March 3). Why We Believe Obvious Untruths*. The New York Times*, Sunday Review section.

Foucault, M. (1976/1980). *Power/Knowledge: Selected Interviews and Other Writings*, 1972-1977 (1st American edition). Translated by C. Gordon. New York: Pantheon Books

Foucault, M. (1984). Right of Death and Power over Life in *The Foucault Reader,* Paul Rabinow (editor). New York: Vintage Books: 258-272

Hayes, Andrew F., Jörg Matthes and William P. Eveland, Jr. (2013). Stimulating the Quasi-Statistical Organ: Fear of Social Isolation Motivates the Quest for Knowledge of the Opinion Climate. *Communication Research*, 40(4): 439-462

Heyhoe, Katharine (2018). When Facts are not Enough. *Science*, 360 (6392): 943

Ioannidis, John (2005). Why Most Published Research Findings Are False. *PLoS Medicine* 2(8):e124

Kahneman, Daniel (2011). *Thinking, Fast and Slow*. New York: Farrar, Straus and Giroux

Kenner, Robert (Director) (2014). *Merchants of Doubt*. Mongrel Media, Sony Pictures Classics

Kolbert, Elizabeth (2017 April 25). Why Facts Don't Change Our Minds. *New Yorker*

Lehrer, Jonah (2010 December 13). The Truth Wears Off. *New Yorker*, 86: 52–57

Logan, Robert A. (2001). Science Mass Communication: Its Conceptual History. *Science Communication*, 23(2): 135-163.

MMR vaccine statement https://www.cdc.gov/vaccinesafety/vaccines/mmr-vaccine.html

Nyhan, Brendan, Jason Reifler, Sean Richey and Gary L. Freed (2014, March). Effective messages in vaccine promotion: A randomized trial. *Pediatrics* 133(4) e835-842.

Wakefield, Andrew J., et al. (1998). Ileal Lymphoid Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children [retracted]. Lancet 351:637-41. *NOTE: The original article included a list of co-authors, several of whom requested that the Lancet remove their names from the study. For citation purposes, please refer to the Lancet.*

Wakeham, Pauline (2008). Taxidermic Signs: Reconstructing Aboriginality. Minneapolis, Minnesota: University of Minnesota Press

Wiegold, Michael F. (2001). Communicating Science: A Review of the Literature. Science Communication, 23(2), 164-193