Philosophy 130
Causation and Explanation
Spring 2019

Who, When, and Where
Professor Jennifer S. Marusic
M,W,Th 10-11am
Lown 203

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The Question
Is giving a scientific explanation of some natural phenomenon always, or ever, a matter of identifying the causes responsible for it?

Philosophers as early as Aristotle claimed that the answer to this question is a resounding "yes!" Yet in the last century a number of philosophers rejected the view that there is any important connection between scientific explanation and causation. Many of these philosophers have done so on the basis of a conviction that the notion of causation is metaphysically suspect or woefully confused. Eschewing the notion of causation, philosophers of science developed a number of influential theories of scientific explanation. None of these theories earned widespread acceptance and all face serious objections. Should we conclude that an adequate theory of scientific explanation must be a causal theory?

In this course, we will attempt to answer this question. First, we'll briefly consider the historical arguments that led 20th century philosophers of science to develop non-causal theories of scientific explanation. Second, we'll examine prominent approaches to scientific explanation and objections that have been raised against them. Third, we'll look at different accounts of the nature of causation. We'll consider in some detail Woodward's 2003 causal theory of explanation. And we'll conclude the course by considering recent developments, especially the renewed interest in varieties of non-causal explanation.

Class Learning Goals

- To raise philosophical questions concerning the relationship between causation and explanation. We'll be focused on questions including:
  - Are all scientific explanations causal explanations?
  - Are there fundamental differences between scientific explanations and other kinds of explanations?
  - Is the ordinary concept of causation hopelessly confused?
To cultivate an understanding of prominent theories of causation and explanation through considering real-world (and some fictional) explanations and causes.

To learn to read, understand, and critically engage with sophisticated and sometimes technical works in the philosophy of science.

To complete a research project concerning some topic related to the themes of the class, including the following tasks:
  o Frame a specific philosophical question or problem to be addressed by the project.
  o Formulate a plan for addressing the question or solving the problem.
  o Write a draft of the paper.
  o Present one’s project to the class and solicit feedback from peers.
  o Revise the paper in light of feedback.

To work collaboratively on original philosophical research:
  o Provide constructive comments on others’ work.
  o Ask helpful, probing questions in response to presentations.
  o Compile a class repository of examples, case studies, and puzzles.

To compose a set of personal learning goals and assess the extent to which they are met.

Requirements
Everyone in the class will have the opportunity to design and complete a research project of approximately 10-15 pages on some topic related to the themes of the class. You are welcome, and even encouraged, to co-author your research project. (If you would like to work in a group larger than 3, please talk to me first.) If you do co-author a project, I’ll ask each member of the group to write up a brief description of what specifically they contributed to the project.

A number of smaller projects will contribute to work on this research project:
  o **Personal learning goals**: Think about what you want to learn from the class and assess the extent to which you meet your goals.
  o **Contribute to an online repository of causes and explanations**: Everyone will contribute cases of important, problematic, puzzling or illustrative examples of causes and explanations, which we can all use in thinking about and writing the research papers (citing, of course, the person who originally thought of the example). *Students should contribute approximately three cases over the course of the semester.*
  o **Practice formulating philosophical problems**: Students will be asked to write two short papers (3-4 pages, one for each unit of the class) formulating a philosophical problem or raising a philosophical question in response to
the readings or class discussions and briefly describing how you might try to solve the problem or answer the question.

- **Find a philosophical problem for your research project:** Students will be asked to formulate a philosophical problem or question that will be the topic of their final research project and outline a plan for completing the paper.
- **Draft:** Write a draft of the paper.
- **Presentations:** Present the paper briefly and respond to questions (15 minutes).
- **Turn in the final paper during finals period!**

### Grading
Since the goal of the class is for students to work on an original research project, your grade will be based primarily on the final product (50%). The two short papers will be worth 25% of the grade. Your contribution to the class, including your contributions to the online repository in-class comments, discussion, and your responses to student presentations will comprise the remaining 25% of the grade.

_Success in this 4 credit hour course is based on the expectation that students will spend a minimum of 9 hours of study time per week in preparation for class (readings, papers, discussion sections, preparation for exams, etc.)._

### Etiquette
You should come to class prepared, having done the readings in advance. _You should bring the texts with you to class!_ We will frequently be referring to the texts during class, so it is important that you have them.

_Please do not multitask!_ That means: no laptops, cell phones, etc. Even taking notes on a laptop hinders class discussion, so please use pen and paper to take notes.

### Readings
Additional required readings will be posted on LATTE or distributed in class.

### Academic Integrity at Brandeis
Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person without proper acknowledgement of that source.

Violations of University policies on academic integrity, described in Section Three of Rights and Responsibilities, may result in failure of the course or on the assignment, or in suspension or dismissal from the University. _If you are in doubt about the instructions for any assignment in this course or about how to properly cite the sources you’ve used, it is your
responsibility to ask for help. If you have questions about academic integrity, please do not hesitate to ask me, refer to the Rights and Responsibilities Handbook, or contact the office of Student Development and Conduct.

**Tentative Schedule**

**Unit 1: Theories of Explanation**

Weeks 1-2: Introduction and the Deductive-Nomological (D-N) Model of Explanation
  - Hempel and Oppenheim (1965).

Please turn in your personal learning goals by Friday, Jan. 25th on LATTE.

Week 3: The Deductive-Statistical (D-S) and Inductive-Statistical (I-S) Models of Explanation
  - Hempel and Oppenheim (1965).
  - Counterexamples to the D-N, D-S, and I-S models: Salmon (1989) Ch 2.3 and 2.5.

Week 4: The Statistical-Relevance Model of Explanation

Week 5: Unificationist Models of Explanation

Short paper #1 due by Feb. 15th on LATTE.

**Unit 2: Causation and Causal Explanation**

Week 6: Counterfactual Theories of Causation

Week 7: Causal Process Models of Causation

Short paper #2 due by March 7th on LATTE.

Weeks 8-9: Interventionist Theories of Causation

Weeks 10-11: Causal Theories of Explanation
Woodward (2003) Chapters 4-7. Proposal for research project due by April 5th on LATTE, with co-authors if applicable.

Unit 3: What comes next? The return of non-causal explanation

Week 12: Non-causal Explanation
- Alisa Bokulich “Searching for Non-causal Explanations in a Sea of Causes”
- student choice!

Weeks 13-14: In-class Presentations!

Draft of research paper due by Thursday, April 18th.

Final paper due by Monday, May 6th.