

## Psychology 269: Seminar on Psychological Causal Inference

Fall, 2009

### **Aim**

To gain a deeper understanding of the psychological process of causal inference by reading literature across multiple disciplines and by active in-class discussions

### **Motivation**

For any intelligent information-processing system, biological or artificial, which kinds of information about the world, among the vast amount present at each moment in each situation, are the most relevant across time and context, for understanding how the world works, and for deciding what actions to take to achieve desired outcomes? The prevailing answer is: cause-and-effect relations.

### **Scope and Approach**

The course focuses on causal discovery: how is rational causal inference possible given observations about the world? We will examine various proposed solutions to the problem. Two approaches have been taken, across multiple disciplines: the strictly empirical approach first proposed by David Hume (1743) and an analytic approach first proposed by Immanuel Kant (1781). At the heart of the debate is the issue: Do and should learners make *a priori* generic assumptions about causal relations in the world, relations that, as noted by Hume, are unobservable? We will also discuss whether there exists a coherent computational system in humans covering related processes, such as causal attribution, category formation, and hypothesis testing. While the aim is to study psychological causal inference, the readings will span sources in philosophy, artificial intelligence, and statistics, in addition to those in cognitive, developmental, and comparative psychology.

### **Requirements**

Pairing up with a classmate to lead a discussion on two topics, participation in class discussions, and writing a paper to examine an issue in depth. The paper should analyze a problem of your choice in causal inference, review and evaluate relevant literature, and, if possible, propose an experiment that would further our understanding of causal inference.