CG186: Topics in Cognitive Science: Causality
Syllabus

Professor
Dave Sobel
Office: Metcalf Research 201
Phone: 863-3038
Email: sobel@cog.brown.edu or Dave_Sobel@brown.edu (not David)
Office Hours: Mondays 2-4pm

Overview
This seminar will concern the principles and processes by which people learn causal knowledge and engage in causal inference, including prediction, explanation, and counterfactual reasoning. Some emphasis will be on probabilistic models of causal inference and on the development of causal reasoning in young children.

Prerequisites
There are no prerequisites for this class. However, it is strongly recommended that undergraduate students have taken an introduction to cognitive psychology course (e.g., COGS0420) and/or an introduction to cognitive development course (e.g., COGS0630).

Course Requirements
The class will meet once a week. Each of these meetings will have readings associated with them. A course requirement is that you do all of these readings, and be prepared to discuss issues that emerge from them in class. Each week, you will generate a 1 page reaction paper to one of the articles you are assigned. As a lynchpin for discussion, I will ask you to talk about the article you have written about. You will also be expected to comment on your classmates’ reactions to the articles you did not write about.

There will also be two paper assignments, a short assignment due in the middle of the term and a long assignment due at the end of the semester.

The distribution of credit for this class is as follows:
1) Weekly Written Assignment (30% of grade)
2) Short mid-semester paper assignment (20% of grade)
3) Final paper assignment (30% of grade)

The remaining 20% of your grade comes from class participation.

A course schedule is detailed below. Some papers are italicized. These paper are optional (although highly recommended) and should be considered primer reading. Your 1 page paper should not exclusively focus on the topics in this paper. Papers with an * come from the Gopnik and Schulz (2007) volume I will talk about on the first day of class. Note that if our discussions go over time, I might change the nature of some assignments.
September 6: Organizational Meeting

September 13: Rosh Hashanah (No Meeting, Makeup Date TBD)

September 20: Theories of Causal Learning I (Associative Models)
   *White (1990)*
   Allan (1980)
   Garcia et al. (1968)
   Dickinson & Shanks (1995)

September 27: Theories of Causal Learning II (Covariation and Mechanisms)
   *Gopnik & Schulz (2007), Introduction*
   Shultz (1982)
   Cheng (1997)
   White (2005)

Oct 4: Theories of Causal Reasoning III (Causal Graphical Models)
   *Pearl (2000), Epilogue*
   Sloman (2006, Chapter 4-5)
   Gopnik et al. (2004)
   Tenenbaum, Griffiths & Niyogi (2007)*
   Griffiths & Tenenbaum (2007)*

Oct 11: Causality and Categorization I: (Categories as Theories)
   *Murphy (2003), Chapter 3*
   Murphy & Medin (1985)
   Rehder & Hastie (2002)
   Rips (2004)

*Friday Oct 12, Short Paper Assignment Due at 5pm*

Oct 18: Causality and Categorization II (Causal Conceptual Development)
   *Gelman (2003), Chapter 5*
   Gelman & Wellman (1991)
   Keil (1989) Ch 8, 9, 13
   Strevens (2000)

Oct 25: Interventions and Causal Learning
   *Woodward (2007)*
   Lagnado & Sloman (2004)
   Hagmayer et al. (2007)*
   Schulz, Glymour, & Gopnik (2007)

Nov 1: Counterfactual Reasoning
Sloman (2006, pp. 78-81)
Kahneman & Varey (1990)
Mandel & Lehman (1996)
Sloman and Lagnado (2005)
Harris et al. (1996)

Nov 8: Time, Causality, and Future Thinking
No Primer Reading
Suddendorf & Busby (2005)
Atance & O’Neill (2001)
McCormack & Hoerl (1999)
Beck et al. (2006)

Nov 15: Explanations and Causal Reasoning
No Primer Reading
Hilton & Erb (1996)
Lombozo (2006)
Wellman & Liu (2007)*

Nov 29: Infants Causal Learning
No Primer Reading
Meltzoff (2007)*
Sommerville (2007)*
Sobel & Kirkham (2007)*

Dec 6: Causal Learning and Learning Science
Kuhn (1989)
Chen & Klahr (1999)
Kuhn & Dean (2004)
Scheines et al. (2007)*

Make up date TBD, Topic and Readings TBD

Due Date of Final Paper: December 20, 2007