

## Benjamin Margolin Rottman

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### ACADEMIC APPOINTMENTS:

Assistant Professor, Department of Psychology, University of Pittsburgh, 2013-present  
Research Scientist, Learning Research and Development Center, University of Pittsburgh,  
2013-present

### DEGREES AND EDUCATION:

Postdoctoral Fellow, Hospital Medicine, The University of Chicago, 2011-2013  
PhD (2011), MPhil (2009), and MS (2008) in Cognitive Psychology, Yale University  
BA in Cognitive Science, Northwestern University, 2006

### GRANTS:

Principal Investigator, "CAREER: Causal Reasoning in Daily Life and its Role in Science Literacy." National Science Foundation, 1651330, 7/1/2017 - 6/30/2022. Total costs: \$628,355.

Principal Investigator, "Developing a Theory of Causal Learning over Time." National Science Foundation, 1430439, 9/1/2014 - 8/31/2016. Total costs: \$282,400.

Co-Principal Investigator (PI: Nokes-Malach, Co-PIs: Binning, Grabowski, Kaufmann, Schunn, Singh, Votruba-Drzal), "Build, Understand, & Tune Interventions that Culminate to Real Impact." National Science Foundation, DUE-1524575, 9/1/2015-8/31/2020. Total costs: \$1,795,922.

Principal Investigator, "Active-Learning of Psychological Research Methods: Authentic Skill Development through Rich Real-World Research Examples and Representations." Discipline-Based Science Education Research Center, University of Pittsburgh, 6/1/14 - 5/31/15. Total costs: \$15,000.

### AWARDS AND FELLOWSHIPS:

APS Rising Star, 2016

"The formation and revision of beliefs about complementary medicine." The University of Sydney School of Psychology Visiting International Collaborator Support. 6-2016.  
Collaborators: Ben Colagiuri, Micah Goldwater, and Evan Livesey.

“Medical Decision Making: Roles of Evidence and Experience.” NRSA Individual Postdoctoral Fellowship, National Heart, Lung, and Blood Institute, 1F32HL108711-01, 2011-2013. Mentors: Reid Hastie, PhD, & David Meltzer, MD, PhD.

“Coherence of Complex Explanations.” Graduate Research Fellowship Program, National Science Foundation. 2007 – 2010. Mentors: Frank Keil, PhD, & Woo-kyoung Ahn, PhD.

#### PEER REVIEWED PUBLICATIONS:

**Rottman, B. M.** (2017). Physician Bayesian updating from personal beliefs about the base rate and likelihood ratio. *Memory & Cognition*, 45, 270-280. doi: 10.3758/s13421-016-0658-z

**Rottman, B. M.**, Marcum, Z. A., Thorpe, C. T., Gellad, W. F. (2017). Medication adherence as a learning process: Insights from cognitive psychology. *Health Psychology Review*, 11(1), 17-32.

**Rottman, B. M.**, Prochaska, M. T., & Deaño, R. C. (2016). Bayesian reasoning in residents' preliminary diagnoses. *Cognitive Research: Principles and Implications*, 1(1), 1-7. **Blog Coverage:** <http://www.psychonomic.org/news/news.asp?id=311122>

**Rottman, B. M.** & Hastie, R. (2016). Do people reason rationally about causally related events? Markov violations, weak inferences, and failures of explaining away. *Cognitive Psychology*, 87, 88-134.

**Rottman, B. M.** (2016). Searching for the best cause: Roles of mechanism beliefs, autocorrelation, and exploitation. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 42(8), 1233-1256. doi:10.1037/xlm0000244

Edwards, B. J., **Rottman, B. M.**, Shankar, M., Betzler, R., Chituc, V., Rodriguez, R., ... Santos, L. R. (2014). Do capuchin monkeys (*Cebus apella*) diagnose causal relations in the absence of a direct Reward? (E. Flynn, Ed.) *PLoS ONE*, 9(2), e88595. doi:10.1371/journal.pone.0088595

**Rottman, B. M.**, Kominsky, J. F., & Keil, F. C. (2014). Children use temporal cues to learn causal directionality. *Cognitive Science*, 38, 489-513. doi:10.1111/cogs.12070

**Rottman, B. M.**, & Hastie, R. (2014). Reasoning about causal relationships: Inferences on causal networks. *Psychological Bulletin*, 140(1), 109-139. doi:10.1037/a0031903

**Rottman, B. M.**, Gentner, D., & Goldwater, M. B. (2012). Causal systems categories: Differences in novice and expert categorization of causal phenomena. *Cognitive Science*, 36, 919-932. doi:10.1111/j.1551-6709.2012.01253.x

**Rottman, B. M.**, & Keil, F. C. (2012). Causal structure learning over time: Observations and interventions. *Cognitive Psychology*, 64, 93-125. doi:10.1016/j.cogpsych.2011.10.003

**Rottman, B. M.**, & Keil, F. C. (2011). What matters in scientific explanations: Effects of elaboration and content. *Cognition*, 121, 324-337. doi:10.1016/j.cognition.2011.08.009.

- Rottman, B. M., & Ahn, W.** (2011). Effect of grouping of evidence types on learning about interactions between observed and unobserved causes. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 37, 1432-1448. doi:10.1037/a0024829
- Rottman, B. M., Kim, N. S. Ahn, W., & Sanislow, C. A.** (2011). Can personality disorder experts recognize DSM-IV personality disorders from Five-Factor Model descriptions of patient cases? *The Journal of Clinical Psychiatry*, 72, 630-635. doi:10.4088/JCP.09mo5534gre
- Chang, A., Sandhofer, C. M., Adelchanow, L., & **Rottman, B. M.** (2010). Parental numeric language input to Mandarin Chinese and English speaking preschool children. *Journal of Child Language*, 38, 341-355. doi:10.1017/S0305000909990390
- Rottman, B. M., Ahn, W., Sanislow, C. A., & Kim, N. S.** (2009). Can clinicians recognize DSM-IV personality disorders from Five-Factor model descriptions of patient cases? *The American Journal of Psychiatry*, 166, 427-433. doi:10.1176/appi.ajp.2008.08070972
- Rottman, B. M., & Ahn, W.** (2009). Causal learning about tolerance and sensitization. *Psychonomic Bulletin and Review*, 16, 1043-1049. doi:10.3758/PBR.16.6.1043

#### BOOK CHAPTERS:

- Rottman, B. M.** (2017). The acquisition and use of causal structure knowledge. In M.R. Waldmann (Ed.), *Oxford Handbook of Causal Reasoning* (85-114). Oxford: Oxford U.P.
- Rottman, B. M., Ahn, W., & Luhmann, C. C.** (2011). When and how do people reason about unobserved causes? In P. Illari, F. Russo, & J. Williamson (Eds.), *Causality in the Sciences*. Oxford: Oxford U.P.
- Edwards, B.J., **Rottman, B. M., Santos, L. R.** (2011). Causal reasoning in children and animals. In T. McCormack, C. Hoerl, and S. Butterfill (Eds.) *Tool Use and Causal Cognition*. Oxford: Oxford U.P.

#### PUBLISHED CONFERENCE PROCEEDINGS:

##### \*Mentored Students

- \*Soo, K., & **Rottman, B. M.** (2016). Causal learning with continuous variables over time. In A. Papafragou, D. Grodner, D. Mirman, & J. Trueswell (Eds.), *Proceedings of the 38th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- \*Derringer, C., & **Rottman, B. M.** (2016). Temporal causal strength learning with multiple causes. In A. Papafragou, D. Grodner, D. Mirman, & J. Trueswell (Eds.), *Proceedings of the 38th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

- \*Soo, K., & **Rottman, B. M.** (2015). Elemental causal learning from transitions. In R. Dale, C. Jennings, P. Maglio, T. Matlock, D. Noelle, A. Warlaumont, & J. Yoshimi (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- Rottman, B. M.** (2015). How causal mechanism and autocorrelation beliefs inform information search. In R. Dale, C. Jennings, P. Maglio, T. Matlock, D. Noelle, A. Warlaumont, & J. Yoshimi (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- Rottman, B. M.** (2015). Do Markov violations and failures of explaining away persist with experience? In R. Dale, C. Jennings, P. Maglio, T. Matlock, D. Noelle, A. Warlaumont, & J. Yoshimi (Eds.), *Proceedings of the 37th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- Rottman, B. M.** (2014). Information search in an autocorrelated causal learning environment. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- \*Soo, K., & **Rottman, B. M.** (2014). Learning causal direction from transitions with continuous and noisy variables. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.
- Rottman, B. M.,** & Keil, F. C. (2011 a). Learning causal direction from repeated observations over time. In L. Carlson, C. Hölscher, & T. Shipley (Eds.), *Proceedings of the 33th Annual Conference of the Cognitive Science Society*. (pp. 1847-1852). Austin, TX: Cognitive Science Society.
- Rottman, B. M.,** & Keil, F. C. (2011 b). Which parts of scientific explanations are most important? In L. Carlson, C. Hölscher, & T. Shipley (Eds.), *Proceedings of the 33rd Annual Conference of the Cognitive Science Society*. (pp. 378-383). Austin, TX: Cognitive Science Society.
- Rottman, B. M.,** & Keil, F. C. (2010). Connecting causal events: Learning causal structures through repeated interventions over time. *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*.
- Rottman, B. M.,** Kim, N. S., Ahn, W., & Sanislow, C. A. (2009). The cognitive consequences of using categorical versus dimensional classification systems: The case of personality disorder experts. *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 2825-2830).
- Rottman, B. M.** & Ahn, W. (2009). Causal Inference when Observed and Unobserved Causes Interact. *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 1477-1482).

**INVITED PRESENTATIONS:**

- Rottman B. M.** (June, 2017). *Causal Learning Over Time*. The University of Sydney, School of Psychology. Sydney, Australia.
- Rottman B. M.** (April, 2017) *Learning causal relations in non-stationary time series environments*. Symposium on Time and Causality at the Experimental Psychology Society. Belfast, Ireland.
- Rottman B. M.** (November, 2015). *Adherence as a causal learning challenge: Insights from cognitive psychology*. The University of Michigan. Ann Arbor, MI.
- Rottman B. M., & Nokes-Malach, T.** (October, 2015). *Authenticity in teaching*. Discipline-Based Science Education Research Center, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (March, 2015). *Transforming research methods in psychology*. Discipline-Based Science Education Research Center, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (February, 2015). *Temporal causal reasoning*. Reasoning Work Group, NIH/NICHHD. Online presentation.
- Rottman B. M.** (September, 2014). *Transforming research methods in psychology*. Discipline-Based Science Education Research Center, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (July, 2014). *Planning and design of a transformed course via dB-SERC course transformation award*. Discipline-Based Science Education Research Center, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (December, 2013). *The psychology of medical diagnosis from previous personal experiences and beliefs*. Intelligent Systems Program, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (September, 2013). *Causal learning in autocorrelated environments*. Department of Psychology, The University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (October, 2012). *Residents' learning about disease prevalence, diagnosis, and post-test probability from experience*. Outcomes Research Workshop, The Center for Health and the Social Sciences, The University of Chicago. Chicago, IL.
- Rottman B. M.** (February, 2012). *Temporal causal learning*. Department of Cognitive Sciences, UC Irvine. Irvine, CA.
- Rottman B. M.** (January, 2012). *Temporal causal learning*. Center for Decision Research, Booth School of Business, University of Chicago. Chicago, IL.
- Rottman B. M.** (January, 2012). *Temporal causal learning*. Department of Psychology, University of Pittsburgh. Pittsburgh, PA.
- Rottman B. M.** (January, 2012). *Temporal causal learning*. Department of Psychology, Harvard University. Cambridge, MA.

**Rottman B. M.** (August, 2011). *Medical decision making: Roles of evidence and experience*. Outcomes Research Workshop, The Center for Health and the Social Sciences, The University of Chicago. Chicago, IL.

**Rottman B. M.** (March, 2009). *Tolerance/sensitization and interacting unobserved causes*. The Computational Cognitive Science Group, Department of Brain and Computational Sciences, MIT. Cambridge, MA.

**Rottman B. M.** (March, 2008). *Causal reasoning and reasoning with explanations*. Department of Psychology, Yale University. New Haven, CT.

#### **PUBLISHED ABSTRACTS AND CONFERENCE PRESENTATIONS:**

**Rottman, B. M.** (March, 2016). *Searching for the best cause and inferring causal strength over time*. Symposium conducted at the Annual Meeting of the Eastern Psychological Association. New York, NY.

**Rottman, B. M.** (November, 2015). *Searching for the best cause: Roles of mechanism beliefs, autocorrelation, and exploitation*. The 56<sup>th</sup> Annual Meeting of the Psychonomics Society. Chicago, IL.

**Rottman, B. M.** (March, 2015). *Causal reasoning: The role of temporal heuristics for sophisticated inferences*. Symposium conducted at the 23<sup>rd</sup> Annual Meeting of the Cognitive Neuroscience Society 2015, San Francisco, CA.

Hastie, R. & **Rottman, B. M.** (November, 2012). *How normative are inferences on causal Networks*. The 53<sup>rd</sup> Annual Meeting of the Psychonomics Society. Minneapolis, MN.

**Rottman, B. M.**, Ahn, W., Kim, N. S., & Sanislow, C. A. (November, 2009). *Categorical Versus Trait-Based Dimensional Classification Systems for Personality Disorders*. The 50<sup>th</sup> Annual Meeting of the Psychonomics Society. Boston, MA.

#### **POSTER PRESENTATIONS:**

\*Mentored Students

\*Soo, K., & **Rottman, B. M.** (November, 2015). *Causal learning from transitions and states*. The 56<sup>th</sup> Annual Meeting of the Psychonomics Society. Chicago, IL.

\*Derringer, C., & **Rottman, B. M.** (July, 2015). *Informative transitions: A heuristic for conditionalized causal strength learning*. The 37<sup>th</sup> Annual Conference of the Cognitive Science Society. Pasadena, CA, USA.

**Rottman, B. M.** (June, 2015). *Human information search: Choosing the best cause*. The Multi-disciplinary Conference on Reinforcement Learning and Decision Making. Edmonton, Alberta, Canada.

- Rottman, B. M.** (June, 2015). *How people test whether a medicine works: Implications for adherence*. Pittsburgh Conference on the Science of Medication Adherence. Pittsburgh, PA, USA.
- Rottman, B. M.,** Prochaska, M., Deaño, R., & Meltzer, D. (March, 2013). *The influence of residents' experiences on disease prevalence judgments, preliminary diagnoses, and post-test judgments*. The 2013 Department of Medicine Research Day, University of Chicago.
- Rottman, B. M.,** Prochaska, M., Deaño, R., & Meltzer, D. (November, 2012). *The influence of prior experiences with patients on medical diagnosis*. The 53<sup>rd</sup> Annual Meeting of the Psychonomics Society. Minneapolis, MN.
- Rottman, B. M.,** & Ahn, W. (November, 2009). *Causal inference when observed and unobserved causes interact*. The 50<sup>th</sup> Annual Meeting of the Psychonomics Society. Boston, MA.
- Rottman, B. M.,** & Ahn, W. (July, 2008). *People distinguish causes that occur to one or multiple entities*. The 30<sup>th</sup> Annual Meeting of the Cognitive Science Society. Washington, DC.
- Rottman, B. M.,** & Gentner, D. (July, 2006). *Expertise effects on sorting strategies of causal phenomena*. The 28<sup>th</sup> Annual Meeting of the Cognitive Science Society. Stresa, Italy.

**EDITORIAL BOARDS:**

Consulting Editor, Journal of Experimental Psychology: General, 2017

Consulting Editor, Cognitive Research: Principles and Implications, 2017

**JOURNAL, CONFERENCE, AND GRANT REVIEWS:**

Acta Psychologica

Cognition

Cognitive Processing

Cognitive Psychology

Cognitive Research: Principles and Implications

Cognitive Science

Developmental Science

Frontiers in Psychology: Cognition

Journal of Experimental Psychology: General

Journal of Experimental Psychology: Learning, Memory, and Cognition

Journal of Personality Disorders

L'Agence Nationale de la Reserche (France)

Medical Decision Making: Policy & Practice

Memory & Cognition

Metacognition and Learning

Psychonomic Bulletin and Review

The Cognitive Science Conference

The National Science Foundation

The Quarterly Journal of Experimental Psychology

Thinking & Reasoning

**PROFESSIONAL MEMBERSHIPS:**

Fellow of the Psychonomic Soceity

Member of the Cognitive Science Society



**EXTERNAL PROFESSIONAL SERVICE:**

2014-2015 Reasoning Work Group, NIH/NICHD

**Graduate Teaching:**

2014-Present Cognitive Program Research Seminar

2016 Academic Writing Workshop

**Undergraduate Teaching:**

2013-Present Research Methods

**INTERNAL PROFESSIONAL SERVICE:**

2013-2014 Search Committee for Social - Health Position

2013-2014 Search Committee for Social - Learning Research & Development Center Position

2014-Present Undergraduate Education Committee

2014-2016,  
2017-Present Organizer of Cognitive Program Research Seminar

2015 Tim Post Award Committee

2016 Mellon Fellowship Committee

2016-Present Colloquium Committee

**GRADUATE STUDENT MENTORSHIP:**

2013-Present Kevin Soo

2014-Present Cory Derringer

2014 A.J. Koury

**GRADUATE STUDENT MASTER'S COMMITTEES:**

2016 Brendan Barstow

**GRADUATE STUDENT MENTORING COMMITTEES:**

2013-Present Emily Braham

2014-2016	Brendan Barstow (Chair)
2015	Regina Leckie
2015-Present	Bart Larson
2016-Present	Heather Bruett

**UNDERGRADUATE STUDENT THESIS COMMITTEES:**

2015	Sara Winter
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**UNDERGRADUATE STUDENT MENTORSHIP:**

2013	Kenneth Holstein
2016	Regis Kearney

**UNDERGRAD AND GRADUATE STUDENT TEACHING ASSISTANT SUPERVISION:**

Fall 2014, Research Methods	Eli Talbert, Andrew Esper, Estizer Smith, Ellen Borza, Ryan Young
Fall 2015, Research Method	Amy Malakoff, Darik O'Neil, Matthew Clista, Leanne Scharr, Maranda Trapolsi, Travis Slopek
Spring, 2017, Research Methods	Leighanne Ohlinger, Erin Jarvis, Emily Braham, Kevin Soo, Cory Derringer