

Laura E. Schulz PhD

Contact information

Department of Brain and Cognitive Sciences
Massachusetts Institute of Technology
43 Vassar St. Bldg. 46-4011b
Cambridge, MA 02139

Phone: 617-253-7957
Email: lschulz@mit.edu
Web: web.mit.edu/eccl/

Degrees

PhD, Developmental Psychology, University of California, Berkeley, 2004,
Thesis Advisor: Alison Gopnik
MA, Developmental Psychology, University of California, Berkeley, 2002
BA, Philosophy, University of Michigan, Ann Arbor. 1992

Academic employment

Class of 1943 Career Development Associate Professor of Cognitive Science
Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology
Cambridge, MA, 2010 – present

Assistant Professor of Cognitive Science
Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology,
Cambridge, MA, 2005 – 2010

Awards and Honors

- American Psychological Association Distinguished Scientific Award for Early Career Contribution to Psychology, 2014
- MIT Macvillar Faculty Fellow, 2013
- National Academy of Sciences, Troland Award, 2012
- Society for Research in Child Development, Award for Early Career Research Contributions, 2011
- National Academy of Sciences, Kavli Fellow, 2011
- MIT Brain and Cognitive Science Angus MacDonald Award for Excellence in Undergraduate Teaching, 2011
- MIT Sigma Xi, Invited Speaker, 2011
- Marr Prize, Cognitive Science Society (student author: Hyowon Gweon), 2010
- NSF Presidential Early Career Award for Scientists and Engineers, 2009
- John Merck Scholars Foundation Award, 2009
- Class of 1943 MIT Career Development Professorship, 2009
- MIT Brain and Cognitive Science Award for Excellence in Undergraduate Advising, 2009
- NSF Faculty Early Career Development award, 2007
- MIT School of Science Prize for Excellence in Undergraduate Teaching, 2007

- Marr Prize, Cognitive Science Society (student author: Elizabeth Bonawitz), 2006
- American Association of University Women, American Dissertation Fellowship, 2004
- National Science Foundation Graduate Research Fellowship Award, 2001
- Hewlett Foundation Graduate Fellowship Award, 2000

Research contracts, fellowships, and grants

Funded grants:

Simons Center for the Social Brain Targeted Project Funding, *A computational and behavioral investigation of our reasoning about others' utility functions in development and mature individuals with ASD and control participants*, 1/1/15-12/31/15, Total project funding; \$138,959

National Science Foundation, *Lookit online interface for large-scale developmental studies*, 8/1/2014-7/31/2017, Total project funding \$369,999.00

Simons Foundation Seed Grant, September, *Costs, Competence, and Morality: A computational and developmental perspective on social cognition impairments in autistic individual*, 8/1/2012-8/1/2013, Total project funding: \$99,612.

John Merck Scholars Award, *Learning by doing: Exploratory behaviors in at-risk infants*, 5/1/2009-4/31/2012, Total project funding; \$300,000.

MIT Class of 1943, Career Development Professorship, 5/1/2009-4/31/2012, Total project funding: \$60,000.

National Science Foundation Faculty Early Career Development Award (NSF CAREER), *Curiosity, Exploratory Play, and the foundations of scientific inquiry*. 6/1/2008-5/31/2013, Total project funding: \$750,000.

John Templeton Foundation, *Curiouser and curiouser: Children's causal knowledge and exploratory play*, 8/1/2007-8/31/2011, Total project funding: \$293,342.

National Science Foundation, Informal Science Education grant, (sub-contractor), *A participatory model for integrating research into science museums*, 8/15/2007-7/31/2009, Total project funding: \$40,000.

Liberty Mutual Foundation, *Boston Children's Museum PlayLab*, 10/1/2007, Total project funding, \$35,000.

James H. Ferry Jr. Fund for Innovation in Research Education Award, *Children's play project: Evidence, action, and causal inference*, 7/1/2005, Total project funding: \$50,000.

James S. McDonnell Foundation, *Collaborative interdisciplinary grant on causal reasoning*, 5/1/2005-4/30/2013, Total project funding: \$240,000.

Publications

Journal articles

Note on authorship: I changed authorship conventions to match those predominant in my department. Starting with papers published in 2010, I am last author on all papers coming out of my lab.

Schulz, L.E. (2015). Infants explore the unexpected (invited perspective on Stahl and Feigenson, 2015), *Science*, 348(6709), 42-43

Jara-Ettinger, J., Gweon, H., Tenenbaum, J., & Schulz, L.E. (in press). Children's understanding of the costs and rewards underlying rational action. *Cognition*.

Jara-Ettinger, J., Tenenbaum, J., & Schulz, L.E. (in press). Not so innocent: Toddlers' inferences about costs and culpability. *Psychological Science*.

Magid, R., Sheskin, M., & Schulz, L.E. (2015). Imagination and the generation of new ideas. *Cognitive Development*. doi:10.1016/j.cogdev.2014.12.008

Gweon, H., Pelton, H., Konopka, J., & Schulz, L.E. (2014). Sins of omission: Children selectively explore when agents fail to tell the whole truth. *Cognition*, 132(3), p. 335-341.

Muentener, P. & Schulz, L.E. (2014). Toddlers infer unobserved causes for spontaneous events. *Frontiers Psychology*, 5:1496. doi: 10.3389/fpsyq.2014.01496

Muentener, P., Friel, D., & Schulz, L. E. (2012) Giving the giggles: Prediction and intervention in young children's representation of psychological events. *PLoS ONE*, 7(8):e42495

Schulz, L.E. (2012). The Origins of inquiry: Inductive inference and exploration in early childhood. *Trends in Cognitive Sciences*, 16(7), p. 382-389.

Muentener, P., Bonawitz, E.B., Horowitz, A., & Schulz, L.E. (2012). Mind the gap: Investigating toddlers' sensitivity to contact relations in predictive events. *PLoS ONE*, 7(4): e34061. doi:10.1371/journal.pone.0034061.

Bonawitz, E. B., Fischer, A., & Schulz, L.E. (2012). Teaching the Bayesian child: Three-and-a-half-year-olds' reasoning about ambiguous evidence. *Journal of Cognition and Development*, 13(2), p. 266-280.

Bonawitz, E. B., Van Schijndel, T., Friel, D., & Schulz, L. E. (2012). Children balance theories and evidence in exploration, explanation, and learning. *Cognitive Psychology*, 64(4), p. 215-134.

Muentener & Schulz (2012). What doesn't go without saying: Communication, induction, and exploration. *Language, Learning, and Development*, 8(1), p. 61-85.

Gweon, H. & Schulz, L.E. (2011). 16-month-olds rationally infer causes of failed actions. *Science*, 332(6037), p. 1524.

Cook, C., Goodman, N., & Schulz, L.E. (2011). Where science starts: Spontaneous experiments in preschoolers' exploratory play. *Cognition*, 120(3), p. 341-349.

Bonawitz, E. B., Shafto, P., Gweon, H., Goodman, N., Spelke, E. & Schulz, L. E. (2011). The double-edged sword of pedagogy: Teaching limits children's spontaneous exploration and discovery. *Cognition*, 120(3), 322-330.

Gweon, H., Tenenbaum, J., & Schulz, L.E. (2010). Infants consider both the sample and the sampling process in inductive generalization. *Proceedings of the National Academy of Sciences* 107(20), 9066-9071.

Bonawitz, E.B., Ferranti, D., Gopnik, A., Meltzoff, A. Woodward, J., & Schulz, L.E. (2010). Just do it? Toddlers' ability to integrate prediction and action in causal inference. *Cognition*, 115, 104-117.

Kushnir, T., Gopnik, A., Lucas C., & Schulz, L. E. (2009). Inferring hidden causal structure. *Cognitive Science* 34(2010), 148-160.

Schulz, L. E., Goodman, N., Tenenbaum, J., & Jenkins, A. (2008). Going beyond the evidence: Preschoolers' inferences about abstract laws and anomalous data. *Cognition*, 109(2), 211-223.

Schulz, L.E., Standing, H., & Bonawitz, E. B. (2008). Word, thought, and deed: The role of object labels in children's inductive inferences and exploratory play. *Developmental Psychology*, 44(5), 1266-1276.

Shtulman, A. & Schulz, L.E. (2008). The relationship between essentialist beliefs and evolutionary reasoning. *Cognitive Science*, 32,(6),1049-1062.

Schulz, L.E., Hooppell, K., & Jenkins, A., (2008). Judicious imitation: Young children imitate deterministic actions exactly, stochastic actions more variably. *Child Development*, 79(2), 395-410.

Schulz, L.E. & Bonawitz, E. B. (2007). Serious fun: Preschoolers play more when evidence is confounded. *Developmental Psychology*, 43(4), 1045-1050.

Schulz, L.E., Bonawitz, E. B. Griffiths, T. (2007). Can being scared cause tummyaches? Naïve theories, ambiguous evidence, and preschoolers' causal inferences. *Developmental Psychology*, 43(5), 1124-1139.

Saxe, R., Schulz, L. E., & Jiang, V. Y. (2007). Reading minds versus following rules: Dissociating theory of mind and executive control in the brain. *Social Cognitive Neuroscience*, 1(3), 284-298.

Schulz, L. E., Gopnik, A., & Glymour, C. (2007). Preschoolers learn causal structure from conditional interventions. *Developmental Science*, 10(3), 322-332.

Schulz, L. E. & Sommerville, J. (2006). God does not play dice: Causal determinism and preschoolers' causal inferences, *Child Development*.77(2), 427-442.

Schulz, L. E. & Gopnik, A. (2004). Causal learning across domains, *Developmental Psychology*, 40(2), 162-176.

Gopnik, A. & Schulz, L. E. (2004). Mechanisms of theory-formation in young children. *Trends in Cognitive Science*, 8(8), 371-377.

Gopnik, A., Glymour, C., Sobel, D., Schulz, L. E., Kushnir, T., & Danks, D. (2004). A theory of causal learning in children: Causal maps and Bayes nets. *Psychological Review*, 111, 1-31.

Leigland, L., Schulz, L. E. & Janowsky, J. (2004). Age-related changes in emotional memory. *Neurobiology of Aging*, 25(8), 1117-1124.

Gopnik, A., Sobel, D. M., Schulz, L. E., & Glymour, C. (2001). Causal learning mechanisms in very young children: Two-, three-, and four-year-olds infer causal relations from patterns of variation and covariation. *Developmental Psychology*, 37(5), 620-629.

Refereed conference proceedings

Gweon, H., Shafto, P., & Schulz, L.E. (2014). Children consider prior knowledge and the cost of information both in learning from and teaching others. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Gweon, H., Chu, V., & Schulz, L.E. (2014). To give a fish or to teach how to fish? Children weigh costs and benefits in considering what information to transmit. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Jara-Ettinger, J., Gweon, H., Tenenbaum, J., & Schulz, L.E. (2014). I'd do anything for a cookie but I won't do that: Children's understanding of the costs and rewards underlying rational action. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Jara-Ettinger, J., Kim, N. Muentener, P., & Schulz, L.E. (2014). Running to do evil: Costs incurred by perpetrators affect moral judgment. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Scott, K., & Schulz, L.E. (2014). Interhemispheric integration of visual concepts in infancy. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Siegel, M., Magid, R., Tenenbaum, J., & Schulz, L.E. (2014). Black boxes: Hypothesis testing via indirect perceptual evidence. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Stave, E., Muentener, P., & Schulz, L.E. (2014). The unintended consequences of checklists. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Tsividis, P., Gershman, S., Tenenbaum, J., & Schulz, L.E. (2014). Information selection in noisy environments with large action spaces. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Yan, P., Magid, R., & Schulz, L.E. (2014). Preschoolers expect others to learn rationally from evidence. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Wu., Y., Baker, C. Tenenbaum, J., & Schulz, L.E. (2014) Joint inference of belief and desire from facial expressions. *36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.*

Jara-Ettinger, J., Tenenbaum, J. & Schulz, L.E. (2013). Not so innocent. Costs, competence, and culpability in very early childhood. *35th Annual Proceedings of the Cognitive Science Society, Berlin, Germany.*

Kline, M., Muentener, P., & Schulz, L.E. (2013) Transitive and periphrastic sentences affect memory for causal scenes. *35th Annual Proceedings of the Cognitive Science Society, Berlin, Germany.*

Shafto, P., Gweon, H., Fargen, C., & Schulz, L.E. (2012). Enough is enough: Inductive sufficiency guides learners' ratings of informant helpfulness. *34th Annual Proceedings of the Cognitive Science Society, Sapporo, Japan.*

Kline, M., Snedeker, J., & Schulz, L.E. (2011). Preschoolers prefer to map novel transitive verbs to events with spatiotemporal features that mark causation. *Boston University Annual Conference on Language Development. Boston, MA.*

Kline, M., Snedeker, J., & Schulz, L.E. (2011). Children's comprehension and production of transitive sentences is sensitive to the causal structure of events. *33rd Annual Proceedings of the Cognitive Science Society, Boston, MA.*

Muentener, P., Friel, D. & Schulz, L.E. (2011). Toddlers' understanding of prediction, intervention, and means of transmission: When psychological outcomes are easier than physical ones. *33rd Annual Proceedings of the Cognitive Science Society, Boston, MA.*

Gweon, H. Schulz, L.E. (2010). Is it me or the world? 16-month-olds distinguish competing hypotheses about the cause of failed interventions. *32nd Annual Proceedings of the Cognitive Science Society*. **2010 Marr Prize for best student paper.**

Bonawitz, E. B., Shafto, P. Gweon, H., Katz, S., Chang, I. & Schulz, L.E. (2009). The Double-edged Sword of Pedagogy: Modeling the Effect of Pedagogical Contexts on Preschoolers' Exploratory Play. *31st Annual Proceedings of the Cognitive Science Society*.

Bonawitz, E.B., Ferranti, D., Horowitz, A., & Schulz, L.E. (2009). The Block Makes It Go: Causal Language Helps Toddlers Integrate Prediction, Action, and Expectations about Contact Relations. *31st Annual Proceedings of the Cognitive Science Society*.

Gweon, H., Tenenbaum, J. & Schulz, L.E. (2009). What are you trying to tell me? A Bayesian model of how toddlers can simultaneously infer property extension and sampling processes. *31st Annual Proceedings of the Cognitive Science Society*.

Bonawitz, E. B. & Schulz, L. E. (2008). Why learning is hard. *Proceedings of the Association for the Advancement of Artificial Intelligence: Naturally-Inspired Artificial Intelligence*.

Bonawitz, E. B., Fischer, A., & Schulz, L.E. (2008). Training a Bayesian: Three-and-a-half-year-olds' reasoning about ambiguous evidence. *30th Annual Proceedings of the Cognitive Science Society*.

Gweon, H. Schulz, L.E. (2008). Stretching to learn: Ambiguous evidence and variability in preschoolers' exploratory play. *30th Annual Proceedings of the Cognitive Science Society*.

Bonawitz, E. B. & Schulz, L. E. (2007). Children's Rational Exploration. *Proceedings of the Association for the Advancement of Artificial Intelligence: Computational Approaches to Representational Change During Learning and Development*.

Bonawitz, E. B., Lim, S., & Schulz, L.E. (2007). Weighing the evidence: children's naïve theories of balance affect their exploratory play. *29th Annual Proceedings of the Cognitive Science Society*.

Bonawitz, E. B., Griffiths, T., & Schulz, L.E. (2006). Modeling cross-domain causal learning in preschoolers as Bayesian inference. *28th Annual Proceedings of the Cognitive Science Society*. **2006 Marr Prize for best student paper.**

Goodman, N., Bonawitz, E. B., Baker, C. Mansinghka, V., Gopnik, A. Wellman, H., Schulz, L. E., and Tenenbaum, J. (2006). Intuitive theories of mind. A rational approach to false belief. *28th Annual Proceedings of the Cognitive Science Society*.

Kuhnsir, T., Gopnik, A., Schulz, L. E., Danks, D. (2003). Inferring hidden causes. *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, 699-703.

Non-refereed publications

Edited Books

Gopnik, A. & Schulz, L. E. (2007). *Causal Learning; Psychology, Philosophy and Computation*. New York: Oxford University Press.

Book Chapters

Schulz, L.E. (2012), Finding new facts; thinking new thoughts. In *Rational constructivism, Adv in Child Dev. And Beh.*, 42 (Xu, F. and Kushnir, T., eds), Elsevier, pgs. 269-294.

Schulz, L. E., Kushnir, T., & Gopnik, A. (2007). Learning from doing: Interventions and causal inference. In A. Gopnik & L. E. Schulz (Eds.), *Causal Learning; Psychology, Philosophy and Computation*. New York: Oxford University Press.

Richardson, T., Schulz, L.E., & Gopnik, A. (2007). Causal inference and functional determinism. In A. Gopnik & L. E. Schulz (Eds.), *Causal Learning; Psychology, Philosophy and Computation*. New York: Oxford University Press.

Book reviews

Saxe, R. & Schulz, L. E. (2006) *Why we read literary criticism*, review of the book, Why We Read Fiction, by Liza Zunshine, Trends in Cognitive Science,

Schulz, L. E. (2001). Review of the book *Understanding Children with Language Problems*. *Studies in Language*, 25, 679-684.

Journal articles currently under review

Magid, R., Yan, P., & Schulz, L.E., Do Children Expect Others to Learn Rationally from Evidence?

Gweon, H., Shafto, P., & Schulz, L.E. Too much information? Prior knowledge and the cost of information in learning and teaching.

Shneidman, L., Gweon, H., Schulz, L.E., & Woodward, A., Learning from others and spontaneous exploration: a cross-cultural investigation.

Wu, Y., Baker, C., Tenenbaum*, J., & Schulz*, L.E. Optimal inferences of beliefs and desires from emotional expressions. (* joint senior authorship)

Wu, Y., Muentener, P., & Schulz, L.E. The invisible hand: Toddlers infer hidden agents when events occur probabilistically.

Presentations and invited lectures

Invited symposia, workshops and colloquia

TED (Vancouver, BC, Canada)	Mar, 2015
Information, Curiosity, and Attention (Bordeaux, FR)	Nov, 2014
University of Maryland, Cognitive Science Colloquium	Oct, 2014
MGH, Psychiatric Genetics and Translational Research	April, 2014
Max Planck Institute, (Leipzig, Germany)	March, 2013
Cognitive Development Society, Invited Symposium	October, 2013
Harvard University Center for Brain Science	September, 2013
Weinberg Cognitive Science Symposium, University of MI	April, 2013
New York University, Departmental Colloquium	November, 2012
University of Chicago, Departmental Colloquium	May, 2012
LA School for Cognitive and Neural Sciences (Argentina)	March, 2012
Collège de France seminar, Paris, France	February, 2012
Budapest CEU Cognitive Development Conference	January, 2012
Yale University	November, 2011
National Science Foundation, Washington DC	October, 2011
Social Cognition Workshop, Philadelphia, PA	October, 2011
NICHD Conference on Math and Science Education, DC	September, 2011
Ernst Strungmann Forum (Frankfurt, Germany)	June, 2011
Sigma Xi Lecture, MIT	May, 2011
Martinos Center, Harvard MGH	April, 2011
Eastern Psychological Association, Cambridge, Ma	March, 2011
National Science Foundation, Washington DC	December, 2010
Ultimate Block Party, NYC	September, 2010
CogEvo Workshop (Roveto, Italy)	June, 2010
Eastern Psychological Association, Cambridge, MA	March, 2010
NICHD Conference on Early Childhood and Play	December, 2009
Boston University	December, 2009
Boston College	December, 2009
Society for Language Development Invited Annual Symposium Address, Boston, MA	November, 2009
Goal-Directed Action Workshop, Princeton, NJ	October, 2009
University of Amsterdam	August, 2009
Statistical Learning Workshop, Banff, MT (Bonawitz presented)	May, 2009
Rutgers University	November, 2008
Stanford University	October, 2008
Harvard University	October, 2008
Wellesley College	August, 2008
Children's Hospital - Harvard Medical School	May, 2008
Wesleyan University	April, 2008
International Conference on Infant Studies, Invited Symposium Address, Vancouver, WA (Goodman presented)	March, 2008
Cognitive Development Society, Invited Presidential Symposium on Children's Learning, Santa Fe, NM	October, 2007
University of Michigan	October, 2007

Physics Education Research Conference, Invited Plenary Address	August, 2007
Eastern Psychological Association, Philadelphia, PA	March, 2007
Yale University	October, 2006
La Pietra, Italy	June, 2006
New York University	May, 2005
California Institute of Technology	November, 2005
Brown University	April, 2005
Warwick University	March, 2005
Harvard University	December, 2004
University of Vancouver, BC	November, 2004

Refereed Conference Presentations

Scott, K. & Schulz, L.E. (Mar, 2015). *Moving the lab home: Validation of a web-based system for developmental studies*. Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Leonard, J., & Schulz, L.E. (Mar, 2015). *The development of implicit theories of effort*. Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Shenidman, L., Gweon, H., Schulz, L.E., & Woodward, A. (Mar, 2015). *Learning from instruction and exploration: A cross-cultural perspective*. Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Wu, Y., Muentener, P., & Schulz, L.E. (Mar, 2015). *The invisible hand: Toddlers represent hidden agents given unexplained probabilistic events*. Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.

Gweon, H., Shafto, P., & Schulz, L.E. (Aug, 2014). *Children consider prior knowledge and the cost of information both in learning from and teaching others*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Gweon, H., Chu, V., & Schulz, L.E. (Aug, 2014). *To give a fish or to teach how to fish? Children weigh costs and benefits in considering what information to transmit*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Jara-Ettinger, J., Gweon, H., Tenenbaum, J., & Schulz, L.E. (Aug, 2014). *I'd do anything for a cookie but I won't do that: Children's understanding of the costs and rewards underlying rational action*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Jara-Ettinger, J., Kim, N. Muentener, P., & Schulz, L.E. (Aug, 2014). *Running to do evil: Costs incurred by perpetrators affect moral judgment*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Scott, K., & Schulz, L.E. (Aug, 2014). *Interhemispheric integration of visual concepts in infancy*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Siegel, M., Magid, R., Tenenbaum, J., & Schulz, L.E. (Aug, 2014). *Black boxes: Hypothesis testing via indirect perceptual evidence*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Stave, E., Muentener, P., & Schulz, L.E. (Aug, 2014). *The unintended consequences of checklists*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Tsividis, P., Gershman, S., Tenenbaum, J., & Schulz, L.E. (Aug, 2014). *Information selection in noisy environments with large action spaces*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Yan, P., Magid, R., & Schulz, L.E. (Aug, 2014). *Preschoolers expect others to learn rationally from evidence*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Wu., Y., Baker, C. Tenenbaum, J., & Schulz, L.E. (Aug, 2014) *Joint inference of belief and desire from facial expressions*. 36th Annual Proceedings of the Cognitive Science Society, Quebec City, Canada.

Kline, M., Snedeker, J., & Schulz, L.E. (2013, March). *Representations of causality in verb learning*. Symposium talk. Biennial meeting of the Society for Research in Child Development, Seattle, WA.

Schulz, L.E. (2013, March). *Bridging moral and cognitive development. How cognitive and social understanding informs morality in early childhood*. Symposium discussant. Biennial meeting of the Society for Research in Child Development, Seattle, WA.

Jara-Ettinger, J., Tenenbaum, J. & Schulz, L.E. (2013, March) *Costs and benefits: How children evaluate the competence, motivation, and moral responsibility of agents*. Symposium talk. Biennial meeting of the Society for Research in Child Development, Seattle, WA.

Kline, M., Muentener, P., & Schulz L.E. (August, 2013) *Transitive and periphrastic sentences affect memory for simple causal scenes*. 34th Annual Proceedings of the Cognitive Science Society, Berlin, Germany.

Jara-Ettinger, J. Tenenbaum, J., & Schulz L.E. (August, 2013) *Not so innocent: Reasoning about costs, competence, and culpability in very early childhood*. 34th Annual Proceedings of the Cognitive Science Society, Berlin, Germany.

Shafto, P., Gweon, H., Fargan, C. & Schulz, L.E. (July, 2012). *Enough is enough: Inductive sufficiency guides learners' ratings of informant helpfulness*. 33rd Annual Proceedings of the Cognitive Science Society, Tokyo, Japan.

Schulz, L.E., (October, 2011). *An Interdisciplinary Approach to the Origins of Causal Inference: Integrating Developmental, Comparative, and Adult Studies*. Symposium discussant. Paper presented at the biennial meeting of the Cognitive Development Society, Philadelphia, PA.

Muentener, P., Friel, D., & Schulz, L.E., (October, 2011). *Investigating domain-specificity in toddlers' causal reasoning abilities*. Paper presented at the biennial meeting of the Cognitive Development Society, Philadelphia, PA.

Gweon, H., Pelton, H., & Schulz, L.E., (2011). *Adults and school-aged children accurately evaluate sins of omission in October, 2011 contexts*. Paper presented at the biennial meeting of the Cognitive Development Society, Philadelphia, PA.

Kline, M., Snedeker, J., & Schulz, L.E. (October, 2011). *Preschoolers prefer to map novel transitive verbs to events with spatiotemporal features that mark causation*. Paper presented at the Boston University Annual Conference on Language Development. Boston, MA.

Kline, M., Snedeker, J., & Schulz, L.E. (July, 2011). *Children's comprehension and production of transitive sentences is sensitive to the causal structure of events*. 32nd Annual Proceedings of the Cognitive Science Society, Boston, MA.

Muentener, P., Friel, D. & Schulz, L.E. (July, 2011). *Toddlers' understanding of prediction, intervention, and means of transmission: When psychological outcomes are easier than physical ones*. 32nd Annual Proceedings of the Cognitive Science Society, Boston, MA.

Schulz, L.E. (2011, March). *Exploring the relationship between physical reasoning and statistical inference in infants*. Symposium discussant. Biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Schulz, L.E. (2011, March). *Exploratory behavior in children and chimpanzees: Factors affecting the quantity and quality of exploration*. Symposium discussant. Biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Schulz, L.E. (2011, March). *Exploratory play and learning in early childhood*. Poster symposium presenter and panelist. Biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Schulz, L.E. (2011, March). *Exploring the relationship between physical reasoning and statistical inference in infants*. Symposium discussant. Biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Gweon, H. & Schulz, L.E. (2011, March). *Is it me or the world? 16-month-olds distinguish competing hypotheses about the cause of failed interventions*. Paper presented at the biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Gweon, H. & Schulz, L.E. (2011, March). *Preschoolers evaluate the effectiveness of*

teaching by integrating self-generated evidence with information provided by others. Paper presented at the biennial meeting of the Society for Research in Child Development, Montreal, Canada.

Gweon, H. Schulz, L.E. (2010, August). *Is it me or the world? 16-month-olds distinguish competing hypotheses about the cause of failed interventions.* Paper presented at the 31st Annual Proceedings of the Cognitive Science Society, Portland, Oregon.

Cook, C., Bonawitz, E. B., & Schulz, L.E. (2009, October). *Inference in a social context: What social and non-social reasoning have to teach each other.* Paper presented at the biennial meeting of the Cognitive Development Society, San Antonio, Texas.

Shtulman, A. & Schulz, L.E. (2009, October). *Creationism is not the (only) problem: Inductive constraints influence children's and adults' understanding of evolution.* Paper presented at the biennial meeting of the Cognitive Development Society, San Antonio, Texas.

Bonawitz, E. B., Shafto, P. Gweon, H., Katz, S., Chang, I. & Schulz, L.E. (2009, August). *The Double-edged Sword of Pedagogy: Modeling the Effect of Pedagogical Contexts on Preschoolers' Exploratory Play.* Paper presented at the 30th Annual Proceedings of the Cognitive Science Society, Amsterdam, Netherlands.

Bonawitz, E.B., Ferranti, D., Horowitz, A., & Schulz, L.E. (2009, August). *The Block Makes It Go: Causal Language Helps Toddlers Integrate Prediction, Action, and Expectations about Contact Relations.* Paper presented at the 30th Annual Proceedings of the Cognitive Science Society, Amsterdam, Netherlands.

Gweon, H., Tenenbaum, J. & Schulz, L.E. (2009, August). *What are you trying to tell me? A Bayesian model of how toddlers can simultaneously infer property extension and sampling processes.* Paper presented at the 30th Annual Proceedings of the Cognitive Science Society, Amsterdam, Netherlands.

Bonawitz, E.B., Schulz, L. E. (2009, March) *Balancing theories and evidence in children's exploration, explanations, and learning.* Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, CO

Bonawitz, E.B., Schulz, L. E. (2009, March) *Language influences toddlers' causal reasoning: From correlation to intervention.* Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, CO

Schulz, L. E. & Gweon, H. (2009, March) *Checks and balances in inductive inference; How children know what they should (and should not) infer from sparse data. (Symposium Chair)* Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, CO

Schulz, L.E., Cook, C., & Gweon, H. (2009, March). *Preschoolers' exploration of*

ambiguous evidence. (Symposium Chair) Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, CO

Bonawitz, E. B. & Schulz, L. E. (2008, November). *Why learning is hard*. Paper presented at the annual meeting of the Association for the Advancement of Artificial Intelligence: *Naturally-Inspired Artificial Intelligence*, Washington DC.

Schulz, L.E. (2008, October). *Using the “Science of Kids” to engage adult visitors*. Paper presented at the annual meeting of the Association of Science-Technology Centers.

Schulz, L.E. (2008, August). *Cognitive Science and Education Research, Engaging issues of social context*. Paper presented at the annual meeting of the Cognitive Science Society, Washington DC.

Bonawitz, E. B., Fischer, A., & Schulz, L.E. (2008, August). *Training a Bayesian: Three-and-a-half-year-olds’ reasoning about ambiguous evidence*. Paper presented at the annual meeting of the Cognitive Science Society, Washington DC.

Bonawitz, E.B., & Schulz, L. (2007, November) *Children's Rational Exploration*. Paper presented at the Association for the Advancement of Artificial Intelligence Symposium Series, Arlington, VA.

Bonawitz, E. B., & Schulz, L. E., (2007, October) *Learning by Doing: The Role of Exploratory Play in Cognitive Development*. Paper presented at the annual meeting of the Cognitive Development Society, Santa Fe, New Mexico.

Schulz, L.E. (2007, May). *Causal learning and exploratory play*. Paper presented at the Origins of Causal Cognition conference, Brussels, Belgium.

Schulz, L. E. (2007, March) *Curiosity, causal knowledge, and science education*. Paper presented at the biennial meeting of the Society for Research in Child Development, Boston, MA

Sommerville, J. & Schulz, L. E. (2007, March). *The hands have it: Eleven-month-old infants recognize when human agency alters causal structure*. Paper presented at the biennial meeting of the Society for Research in Child Development, Boston, MA

Baraff Bonawitz, E. B & Schulz, L. E. (2007, March) *Can being scared make your tummy ache? Naïve theories, ambiguous evidence, and preschoolers’ causal reasoning*. Paper presented at the biennial meeting of the Society for Research in Child Development, Boston, MA

Schulz, L. E. & Baraff Bonawitz, E. B. (2007, March) *Serious Fun: Preschoolers play more when evidence is confounded*. Paper presented at the biennial meeting of the Society for Research in Child Development, Boston, MA

Schulz, L.E. (2007, March). *Twisting the lion's tail: Ambiguous evidence, exploratory play, and children's causal learning*. Invited symposium talk at the annual meeting of the Eastern Psychological Association, Philadelphia, PA.

Schulz, L. E. (2006, April). *Causal mechanisms and causal learning*. Paper presented at the Project for Causal Understanding, Warwick University

Schulz, L. E., Sommerville, J. & Gopnik, A. (2005, July) *Causal Determinism and Preschoolers' Causal Inferences*. Paper presented at the 26th annual meeting of the Cognitive Science Society, Stresa, Italy.

Schulz, L. E. (2005, April). *God Does Not Play Dice: Causal Determinism and Children's Inferences About Unobserved Causes*. Paper presented at the biennial meeting of the Society for Research in Child Development, Atlanta, GA.

Schulz, L. E. (2004, July). *Sight Unseen: Children's Inferences About Unobserved Causes*. Paper presented at the annual meeting of the Society for Philosophy and Psychology. Barcelona, Spain.

Gopnik, A. & Schulz, L.E. (2004, February). *Actions, Interventions and Casual Maps*. Paper presented at the annual meeting of the American Association for the Advancement of Science. Seattle, WA.

Gopnik, A. & Schulz, L.E. (2003, September). *Causal Learning and Theory of Mind*. Paper presented at Other Minds: An Interdisciplinary Conference, Eugene, OR.

Schulz, L. E., (2003, April). *The play's the thing: Interventions and causal inference*. Paper presented at the biennial meeting of the Society for Research in Child Development. Tampa, FL.

Schulz, L.E., (2003, April). *Understanding children's causal knowledge: Exploring the origins of causal inference. (Symposium chair)*. Biennial meeting of the Society for Research in Child Development, Tampa, FL.

Schulz, L. E., (2001, December). *Spinning wheels and bossy ones: Children, causal structure and the calculus of intervention*. Paper presented at the Causal Inference in Humans and Machines Workshop of the Neural Information Processing Systems annual meeting, Vancouver British Columbia.

Schulz, L. E. (2001, October). *"Do-calculus": Adults and preschoolers infer causal structure from patterns of outcomes following interventions*. Paper presented at the biennial meeting of the Cognitive Development Society, Virginia Beach, VA.

Teaching Experience

MIT 9.85: Topics in early childhood cognition (undergraduate course)

Communication Intensive in the Major (CIM) as of Fall, 2009

Department of Brain and Cognitive Sciences, MIT

Semesters taught: Fall, 2005-2007, Spring, 2009, Fall 2009- 2013

Role: sole instructor

Special Topics, 9.52: Project-based seminar in Infant and Early

Childhood Cognition (advanced undergraduate independent research course)

Department of Brain and Cognitive Sciences, MIT

Semesters taught: Spring, 2012, Spring 2013, Spring 2014

Role: sole instructor

MIT 9.916: Core knowledge and cognitive development (graduate course)

Department of Brain and Cognitive Sciences, MIT

Semesters taught: Spring, 2011

Role: co-instructor with Elizabeth Spelke

MIT 9.914: Explorations in exploration (graduate course)

Department of Brain and Cognitive Sciences, MIT

Semesters taught: Spring, 2010

Role: co-instructor with Rebecca Saxe

MIT 9.916: Perception, conception, and action (graduate course)

Department of Brain and Cognitive Sciences, MIT

Semesters taught: Spring, 2008

Role: co-instructor with Chris Moore and Noah Goodman

MIT 9.916: Conceptual development (graduate course)

Department of Brain and Cognitive Sciences, MIT; cross-listed Harvard University

Semesters taught: Spring, 2007

Role: co-instructor with Susan Carey (Harvard University)

MIT 9.94: The cognitive science of intuitive theories (IAP course)

Department of Brain and Cognitive Sciences, MIT

Semesters taught: IAP, 2006

Role: co-instructor with Tania Lombrozo, Josh Tenenbaum, Rebecca Saxe, and Kathryn Schulz

Human Development (undergraduate course)

Portland State University

Semesters taught: Summer: 2000, 2001, Winter: 2002; Spring: 2002

Role: sole instructor

Child Development (undergraduate course)

University of California, Berkeley

Semesters taught: Winter: 2001

Role: teaching assistant

Service

Internal service:

Undergraduate Officer, Department of Brain and Cognitive Sciences, 2012-present
Chair, BCS Cognitive Search Committee, 2015
Knight Fellow Search Committee, 2014
Head of Cognitive Area Search Committee, 2013/2014
Graduate Women at MIT (GWAMIT) Mentor, 2010-2012
Freshman advisor 2011-2012
MIT Committee on Undergraduate Programs (CUP), 2007-2010.
IAP 2011: 9.911: Responsible conduct in science
AMGEN scholar sponsor, 2010
School of Science Teaching Award Selection Committee, 2009.
Freshman Residence Based Advisor, 2007-2009.
Cognitive Area Faculty Search Committee, 2006, 2007, 2008, 2009, 2010
Freshman Orientation (Lab tour exploration) 2008, 2009, 2011
MIT Commencement, 2009
MIT Club, Alumni Talk, 2007
IAP, The Cognitive Science of Intuitive Theories (9.94), 2006
MIT Research Science Institute, Faculty Mentor, 2005.

External service:

Boston Children's Museum, Research/Education Partnership, July, 2006- present
Museum of Science, Boston, Research/Education Partnership, October, 2005–2010.

Initiated two university/museum partnerships to create onsite “living laboratories” and educational exhibits for outreach on cognitive development, over 9,000 children and families involved to date.

Reviewer for: Applied Developmental Psychology, British Journal of Child Psychology, Child Development, Cognitive Development, Cognition, Cognitive Science, Developmental Psychology, Journal of Experimental Psychology, General, Philosophical Quarterly, Philosophical Psychology, Psychological Science, Science

UROP Students Supervised:

Albuquerque, Asha, Summer 2011
Anwar, Tayyba, Fall 2006, Current position: New York University medical student
Brenman, Stephanie, Spring 2008, Summer 2008, Fall 2008, IAP 2009, Spring 2009, Current position: Stanford medical student
Callahan, Brendan, Fall 2007
Chang, Isabel, Summer 2007, Fall 2007, Spring 2008, IAP 2008, Fall 2008, Spring 2009
Chen, Emily, Summer 2011

Chen, Yiling, Fall 2010
Cetinkaya, Ezra, Fall 2005, High School Student Intern
Chandrasekar, Hamsika, Winter, 2010
Clark, Catherine, IAP 2008, Spring 2008, Summer 2008, Fall 2008, and Spring 2009 Current position: Koch Institute for Integrative Cancer Research.
Dames, Chloe, Spring, 2010
Dahan, Sara, Fall, 2010
Dassuncao, Clifton, Fall 2006
Deshmane, Anagha, Fall 2006, Current position: PhD student in Biomedical Engineering at Case Western Reserve University
Distel, Laura, Summer 2011
Dohlman, Jenny, Spring 2010
Doykan, Camille, Fall 2008, Spring 2009, (Wellesley College Undergraduate)
Falciglia, Kristin, Spring 2007, Summer 2007, Current position: Clinical Research Coordinator for Mount Sinai School of Medicine in clinical Alzheimer's research.
Ferranti, Darlene, IAP 2006, Spring 2006, Current position: Research Coordinator for Northwestern University Division of Hospital Medicine
Fischer, Adina, Fall, 2007, Spring, 2008, Current position: MD/PhD student at Dartmouth College
Melina Flores, Spring, 2010, Fall, 2010
Garber, Michelle, Fall 2008, Spring 2009, Fall, 2010
Garr, Eric, Summer 2011
Ghadyali, Zahra, Summer 2009, (Wellesley College Undergraduate)
Gumlak, Sarah, Fall 2008, Spring 2009
Headen, Irene, Spring, 2006
Hedberg, Kallie, Summer 2009
Hernandez, Rosa, Fall, 2010, Spring 2011, Fall 2011
Hsu, Alexandra, Spring 2011
Hu, Caroline, Spring, 2010
Huang, Caroline, Spring, 2010
Kandil, Mariam, Spring 2007
Kasman, Emily, Summer 2011
Katz, Sydney, (Boston University Undergraduate) Summer 2008, Fall 2008, IAP 2009, Spring 2009, Current position: Boston University medical student
Khettry, Anuja, Spring 2006
Kim, Danbee, Spring 2008, Current position: RA at Beth Israel on the CIDAR for schizophrenia
Kim, Joseph, Spring 2011
Kim, Olivia, Spring 2008
Konopka, Jaclyn, Summer 2011, Fall 2011
Kwinn, Cheryl, Summer 2008, Fall 2008, IAP 2009, Spring 2009, Summer 2009
Lansley, Chanelle, Winter, 2010
Levine, Elanna, Fall 2006
Lim, Suejean, Fall 2006, IAP 2007, Spring 2007, Spring 2008
Lin, Anita, Fall, 2010
Lizcano, Liza Renee, Fall, 2007, Spring, 2008

Marquart, Samantha, Winter, 2010
Martirosyan, Nune, Fall 2004, Ph.D. at MIT, Brain and Cognitive Sciences
Marzloff, George, Fall 2004, Current position: Research Coordinator at Mount Sinai School of Medicine
Neel, Phoebe, Summer 2008 (high school student), Current position: Brown University Undergraduate
Obliade, Mike, Fall 2007, Spring 2008, Current position: PhD student at University of Illinois
O'Connell, Claire, Spring 2011
Pelton, Hannah, Spring 2009, Summer 2009, Spring, 2010, Summer, 2010, Fall, 2010, Spring 2011, Summer 2011, Fall 2011
Perlow, Christine, Summer 2011
Pollard, Kiersten, Spring, 2009, Current position: Technical Assistant in Gabrieli Lab, Brain and Cognitive Sciences at MIT
Renno, Maggie, Spring, 2010
Ricker, Elizabeth, Fall 2005, Current position: working at software firm, Slique, Inc.
Sanon, Meekerley, Fall, 2010
Sinha, Shyamli, Fall 2006
Standing, Holly, Spring 2007, Cambridge University, Current position: MD/PhD student at Oxford University
Than, Kyi-Sin, Summer, 2010
Tong, Stephanie, Spring 2009, Summer 2009, Fall, 2009, Spring, 2010
Watson, Christopher, Spring 2006
Wexler, Anna, Fall 2005, Current position: a WGBH artist in residence in documentaries
Wienerman, Wendy, Summer 2006, (Whitman College Undergraduate), Current position: Psychology PhD candidate at Rochester Institute of Technology,
Wu, Yunji, Spring, 2007, Current position: Biology PhD student at Caltech
Yao, Catherine, Spring, 2005
Young, Amanda, Summer 2010, Summer 2011
Yu, Jennifer, Summer 2010

Masters students supervised

Catherine Hooppell MS Cognitive Science, Department of Brain and Cognitive Sciences, MIT, 2004-2006.

Cook, Claire, MS Cognitive Science, Department of Brain and Cognitive Sciences, MIT, 2007 – 2011.

PhD students supervised

Bonawitz, Elizabeth Baraff, *The rational child: Theories and evidence in prediction, exploration and explanation*, Supervised 2005 - 2009. Current position: postdoctoral researcher, University of California, Berkeley.

Gweon, Hyowon, (PhD Candidate – in progress). Department of Brain and Cognitive

Sciences, MIT. Supervised 2007 – present.

Jara-Ettinger, Julian (PhD Candidate– in progress) Department of Brain and Cognitive Sciences, MIT. Supervised 2011 – present.

Scott, Kimberly (PhD Candidate– in progress) Department of Brain and Cognitive Sciences, MIT. Supervised 2011 – present.

Yang Wu (PhD Candidate– in progress) Department of Brain and Cognitive Sciences, MIT. Supervised 2012 – present.

Tsividis, Pedro (PhD Candidate– in progress) Department of Brain and Cognitive Sciences, MIT. Supervised 2012 – present.

Postdoctoral Researchers Supervised

Nathan Winkler-Rhodes (PhD, Harvard University) 2012-present.

Mina Cikara (PhD, Princeton University) 2011-present.

Muentener, Paul, (PhD, Harvard University), 2009-present.

Shtulman, Andrew, (PhD, Harvard University) 2006-2007.
Current position: Assistant Professor, Occidental College

Media coverage:

The Los Angeles Times (June, 2014)
Boston Magazine (June, 2014)
The Boston Globe (June, 2011)
Science, Podcast (June, 2011)
The Economist (May, 2011)
The Boston Globe (front page, March, 2011)
Slate Magazine (March, 2011)
The Science Network (November, 2011)
The Oregonian, (front page, August, 2010)
Scientific American (July, 2010)
Slate Magazine (October 29th, 2009)
New York Times (August 16th, 2009)
Mind in the Making (PBS) (July, 2008)
Scientific American Mind (February/March, 2007)
Scientific American Mind (June, 2006)
National Public Radio, KPW Utah (May, 2006)
Time Magazine (September, 2005)
New York Times (January 16th, 2005)

