
CHRISTIAN DIETER SCHUNN

STEM reasoning and learning
Neuroscience of complex learning

Web-based peer interaction and instruction
Engagement and learning

CONTACT INFORMATION

LRDC 821; 3939 O'Hara St.
University of Pittsburgh

schunn@pitt.edu
<http://www.lrdc.pitt.edu/schunn>

+1.412.624.8807 Voice
+1.412.624.7439 Fax

EMPLOYMENT

University of Pittsburgh 2001–Present
Psychology; Learning Sciences and Policy; Intelligent Systems
Learning Research & Development Center
Professor 2011; Associate 2006; Assistant 2001
Senior Scientist 2011; Research Scientist 2001

George Mason University 1998–2001
Psychology
Assistant Professor

Carnegie Mellon University 1995–98
Psychology
Postdoc (*Advisors: John Anderson, Lynne Reder*)

EDUCATION

1993–95 PhD, Psychology, Carnegie Mellon University (*Advisor: David Klahr*)
1990–93 MS, Psychology, Carnegie Mellon University
1987–90 BS, Honors Psychology, Minor Mathematics, Minor Computer Science, McGill University

EXTERNAL GRANTS

Current

1. *Computer Science Student Network Badge System*. MacArthur Foundation, HASTAC/MacArthur Digital Media and Learning Badges for Lifelong Learning, Co-PI with R. Shoop, 4/1/12–3/31/13, \$175,000.
2. *Teaching Writing and Argumentation with AI-supported Diagramming and Peer Review*. National Science Foundation, IIS-1122504, Co-PI with K. Ashley and D. Litman, 09/01/11–08/31/14, \$1,349,986.
3. *Center for the Study of Activated Science Learners*. Gordon and Betty Moore Foundation, PI, CoPIs K. Crowley, R. Dorph, and P. Shields. 02/01/11 – 1/31/12, \$2,199,556.
4. *Modeling Engineered Levers for the 21st Century Teaching of STEM*. National Science Foundation, DRL-1027629, PI, CoPI M. K. Stein. 09/01/10–08/31/14, \$2,593,766.
5. *The Robot Algebra Project*. National Science Foundation, DRL-1029404, PI, CoPIs M. K. Stein and R. Shoop. 09/01/10–08/31/13, \$449,969 Pitt Contract.
6. *Fostering Innovation through Robotics Exploration*. Defense Advanced Research Projects Agency, Co-PI Investigator with R. Shoop, A. Corbett, K. Koedinger, W. Dann, H. Choset, M. Veloso, and L. Levin. 07/14/10–9/30/12, \$270,978 Pitt subcontract.
7. *The 21st Century Research and Development Center on Cognition and Science Education*. Institute for Educational Sciences, R305C080009, Co-PI with J. Merlino, A. Porter, J. Cromley, N. Newcombe, and T. Nokes, 7/1/08–6/30/13, \$9,995,038.
8. *Advanced Analogical Search with Integrated Function and Form: The Verocchio Project*. National Science Foundation, CMMI-0855293, Co-PI with J. Cagan and K. Wood, 07/01/09–06/30/12, \$450,000.
9. *Training in Arithmetical Fluency*. National Science Foundation, EHR-0815945, Co-PI with J. Fiez, 9/1/08–8/31/12, \$1,241,567.

Prior

1. *Assessing the Young Activated Science Learner*. Gordon and Betty Moore Foundation, PI, CoPIs K. Crowley and R. Dorph. 06/14/10 – 09/30/11, \$380,000.
2. *Connecting Research and Teaching Through Product Realization: The Pittsburgh Quality of Life RET Site*. National Science Foundation, EEC-0808675, Co-PI with M. Lovell, A. Landis, and S. Balouris, 6/1/08–12/30/11, \$489,700.
3. *Integrating Social and Cognitive Elements of Discovery and Innovation*. National Science Foundation, SBE-0830210, PI, 9/1/08–8/31/11, \$214,556.
4. *Biologically Accelerated Learning Technology (BALT) Phase II*. Defense Advanced Research Projects Agency, NBCHC070104, Co-PI with W. Schneider, N. Tokowicz, J. Moss, and T. Huppert, 1/1/09–12/31/10, \$2,360,000.
5. *Workshop on Confidential Data Collection for Innovation Analysis in Organizations*. National Science Foundation, SBE 0943337. PI, 9/15/09–9/15/10, \$50,312.
6. *Design Tools to Cognitive Processes to Innovation*. National Science Foundation, SBE-0738071. PI, 1/1/08–06/31/10, \$373,985 and \$74,732 supplement (SBE-0823628).
7. *University of Pittsburgh for Research Experience for Teachers Innovation Generation grant*. Motorola Foundation. Co-PI with M. Lovell, 1/1/08–12/31/09, \$50,000.
8. *Biologically Accelerated Learning Technology*. Defense Advanced Research Projects Agency, Co-PI with W. Schneider, N. Tokowicz, and K. VanLehn, 3/1/07–9/30/08, \$1,168,781.
9. *Robotics Corridor*. National Science Foundation, DUE-0703104, PI on Subcontract, 5/1/07–4/30/10, \$149,729 subcontract.

10. *Evaluation of a Robotics Curriculum*. Heinz Foundation, PI on Subcontract, 1/1/07–12/31/07, \$38,054 subcontract.
11. *Evaluation of Open Learning Initiative Logic & Proofs*. William and Flora Hewlett Foundation, PI on Subcontract, 1/1/07–12/31/07, \$43,350 subcontract.
12. *Materials for Innovative Design into Urban High Schools*. Snee-Reinhardt Foundation. PI, 9/1/06–8/31/07, \$20,350.
13. *Center for e-Design: IT Enabled Infrastructure and Technology*, National Science Foundation, Co-PI with M. Lovell, 7/06–6/08, \$160,000.
14. *Towards a Science of Innovative Design*. National Science Foundation, BCS-0638451. PI, 9/1/06–8/31/08, \$160,000.
15. *Workshop on the Scientific Basis of Individual and Team Innovation and Discovery*. National Science Foundation. PI, 5/1/06–4/30/07, \$35,696.
16. *Predictive Theories for Better Displays of Uncertainty in Complex Visual Problem Solving*. Office of Naval Research, N000140610053. PI, 10/1/05–12/30/07, \$171,600.
17. *Bringing Innovative Design into Urban High Schools on a Sustainable Basis: The University of Pittsburgh Innovative Design RET Site*. National Science Foundation, EEC-0502035. Co-PI with M. Lovell, 4/1/05–3/31/08, \$400,000.
18. *The Impact of a Technology-Scaffolded Peer Evaluation Writing System on Writing Skills and Course Content Knowledge*. A. W. Mellon Foundation. PI, 1/1/04–12/31/06, \$350,000.
19. *ACT-R/S and the Role of Mental Transformations in Complex and Map-Mediated Navigation*. Office of Naval Research, N000140210113. PI, 10/1/03–9/30/06, \$337,044.
20. *SCALE: Systemwide Change for All Learners and Educators*. National Science Foundation, EHR-0227016. Co-PI with L. Resnick, T. Millar, A. Porter, & K. Lesley, 01/01/03–12/31/07, \$35,000,000.
21. *Complex Problem-Solving with Certain Representations of an Uncertain World*. Office of Naval Research, N000140310061. PI, 10/1/02–9/30/05, \$237,718.
22. *Model-assisted reasoning in science: Effects of model-centered instruction on middle school students' modeling abilities*. National Science Foundation. Co-PI with K. Raghavan, 7/1/02–6/30/05, \$1,021,343.
23. *Modeling distant psychological space in complex problem solving*. Office of Naval Research. PI, 6/1/00–8/31/03, \$194,982.
24. *Learning leadership skills in distributed training scenarios: Diagnosing strategies in scenarios using Latent Semantic Analysis*. Army Research Institute. PI, 9/1/00–8/31/02, \$179,099.
25. *The role of environmental awareness and private speech in adapting and controlling behavior in children with autism*. Autism Society of America Foundation. PI, Co-PI A. Winsler, 10/1/00–9/30/02, \$50,000.
26. *CyberE: Cyber environment for organizational adaptability*. Lucite/National Security Agency, Co-PI with J. Foreman & D. Rine, 11/1/00–10/31/01, \$138,916.
27. *Cross-cultural views of collaborative research*. Mitsubishi Bank Foundation. Co-PI with T. Okada & K. Crowley, 9/1/94–8/31/98, \$54,000.

INTERNAL GRANTS

1. *Keeping well-informed in computer-supported peer review*. LRDC Internal Grant. Co-PI with K. Ashley, D. Litman, J. Wang. 7/01/11–6/30/13, \$131,100.
2. *Improving Learning from Peer Review with NLP and ITS Techniques*. LRDC Internal Grant. Co-PI with D. Litman and K. Ashley. 7/01/09–6/30/11, \$150,000.
3. *A case library of authentic, effective writing assignments for peer-based learning*. Provost's Innovation in Education Award. PI, 05/01/08–4/30/09, \$23,625.
4. *A web-based system for reciprocal evaluation of student paper writing*. Provost's Innovation in Education Award. PI, 05/01/02–4/30/03, \$10,800.
5. *The cognition underlying scientific visualization*. Office of the Provost Central Research Development Fund, University of Pittsburgh. PI, 7/1/02–6/30/04, \$13,818.
6. *The role of domain-familiarity in the transfer of complex cognitive skills*. College of Arts and Sciences GRA, George Mason University. PI, 9/1/00–5/31/01, \$5,000.
7. *Enabling authentic activities in psychology with authentic software*. Technology Across the Curriculum Grant, College of Arts and Sciences, George Mason University. PI, 6/1/00–8/31/00, \$2,500.
8. *The role of authentic experiments in learning about the scientific process*. Faculty Summer Research, Provost's Office, George Mason University, George Mason University. PI, 6/1/00–8/31/00, \$3,380.
9. *Course release for grant preparation*. College of Arts and Sciences, George Mason University. PI, 1/1/00–5/31/00.
10. *The cognition underlying scientific visualization*. College of Arts and Sciences GRA, George Mason University. PI, 9/1/99–5/31/00, \$5,000.
11. *Analysis of analogies in lab group settings*. Faculty Summer Research, Provost's Office, George Mason University, George Mason University. PI, 6/1/99–8/31/99, \$3,380.
12. *Building a better lab experience: Revising the PSYC 305 lab to enable students to learn about and participate in authentic research activities*. Celebration of Learning Grant, Provost's Office, George Mason University. PI, 1/1/99–5/31/99, \$2,450.

CURRICULAR MATERIALS

SWoRD: sword.lrdc.pitt.edu (peer review and writing)
 Heating & Cooling Unit (High school chemistry)
 Designer Bacteria Unit (High school biology)
 Gecko Unit (High school biology & math)

Alarm Systems Unit (Middle school physical science)
 Lift Systems Unit (High school physics)
 Launcher Unit (High school physics)
 Dancing Robots Unit (Middle school robotics & math)

HONORS AND AWARDS

Society Fellowships

American Association for the Advancement of Science, Section Q, 2011
American Psychology Association, Division 3, 2009
International Society for Design & Development in Education, 2006

Conference Awards

Best work at ED-Media conference (with Kwangsu Cho), Hawaii, 2003
Best student proposal award, Creative Concepts conference, Texas A&M University, 1995

Research Fellowships

Fonds pour la Formation de Chercheurs et à l'Aide la Recherche Graduate Fellowship, 1990-1992; 1994-1995
Natural Sciences and Engineering Research Council Graduate Fellowship, 1992-1994
Natural Sciences and Engineering Research Council Undergraduate Summer Research Award, 1989; 1990

Undergraduate Awards

Major Hiram Mills Medal, Boris Muskatov Prize, Dow-Hickson Scholarship, J. W. McConnell Award, Emily Ross Crawford Scholarship

PROFESSIONAL SERVICE

International Society for Design & Development in Education

Chair of Executive Committee, 2011-present
Chair of the Eddie Prize committee, 2010,11

National Academy of Engineering / NRC Committee Member

K-12 Engineering Education, 2007-09
K-12 Engineering Education Standards, 2008-10

APA Electronic Resources Committee Member, 2000-03

University of Pittsburgh Service

Leadership Service

Cognitive Graduate Program Chair, 2006-8; 2009-11
Psychology Undergraduate Education Committee Chair, 2008-9
LRDC Strategic Planning Committee Chair, 2008-9
Faculty Search Committee Chair, 2009,10,11

Faculty Committee Membership

Advisory Council on Instructional Excellence, 2010-13
Faculty search committees (Psychology, Education, Nursing), 2002,3,4,5,6,8,9,10,11
LRDC Executive Committee, 2007-Present
LRDC Strategic Planning, 2007-09
Psychology Undergraduate Education Committee, 2002-8
Tenure committees (Psychology, Education), 2009,10,11

Grant Reviewing

NSF Regular Review Panel Member (SBE, EHR, CISE), 2000-Present
IES Review Panel Member, 2011-Present
Deutsche Forschungsgemeinschaft Review Panel Member, 2009, 11

Editorial Board Member

Journal of Educational Psychology, 2008 – present
Cognitive Science, 2005 – present
Journal of Psychology of Science and Technology, 2006 – present
Cognitive Systems Research, 2008-10

Guest Editor, Special Issue on Computer-Supported Peer Review of Writing of the *Journal of Writing Research*; Special Issue on Computational Cognitive Modeling of *Cognitive Systems Research*.

Ad hoc Reviewer (beyond editorial board reviewing listed above):

- Education: *Journal of the Learning Sciences*, *Review of Educational Research*, *Cognition & Instruction*, *Computers & Education*, *Educational Psychologist*, *Journal of Engineering Education*, *Educational Evaluation and Policy Analysis*, *Mathematical Thinking and Learning*, *Science Education*
- Cognitive Psychology: *Psychological Bulletin & Review*, *Memory & Cognition*, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *Cognitive Psychology*, *Cognition*, *European Journal of Cognitive Psychology*, *Topics in Cognitive Science*, *Cognitive Processing*, *Quarterly Journal of Experimental Psychology*
- General Psychology: *Journal of Experimental Psychology: General*, *Psychological Review*, *Psychological Science*, *British Journal of Psychology*
- Other Psychology: *Journal of Social Psychology and Personality*, *Developmental Psychology*, *Cognitive Development*
- Engineering Design: *Journal of Mechanical Design*, *Research in Engineering Design*, *Artificial Intelligence for Engineering Design*, *Analysis and Manufacturing*
- Other: *Transactions on Computer-Human Interaction*, *The Data Base for Advances in Information Systems*, *Technological Forecasting and Social Change*, *Academy of Management Review*

Conference Organizer

International Society for Design and Development in Education, Boston, MA, September, 2011
Computer-Supported Peer Review in Education: Synergies with Intelligent Tutoring Systems, Pittsburgh, PA, June, 2010
Workshop on Confidential Data Collection for Innovation Analysis in Organizations. Redmond, WA, September, 2009
Innovation and Discovery Workshop: The Scientific Basis of Individual and Team Innovation and Discovery. Ballston, VA, May 2006
The 6th International Conference on Cognitive Modeling. Pittsburgh, PA, July, 2004
The 24th Annual Meeting of the Cognitive Science Society. George Mason University, August, 2002
The 4th International Conference on Cognitive Modeling. George Mason University, July, 2001
The 6th Annual ACT-R workshop. George Mason University, August, 1999
Designing for Science. Pittsburgh, PA. April, 1998

PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science, Fellow
American Educational Research Association
American Psychological Association, Division 3 Fellow
Association for Psychological Science
American Society for Engineering Education

Cognitive Science Society
International Society of the Learning Sciences
International Society for Design & Development in Education, Chair
International Society for the Psychology of Science & Technology
Psychonomic Society

TEACHING EXPERIENCE

University of Pittsburgh

Graduate

Skill Acquisition, 2006,10
Design of Educational Systems, 2009,10
Problem Solving and Reasoning, 2002,3
Foundations of Cognition, 2011

Undergraduate

Cognitive Science, 2005, 6, 8
Cognition & Instruction, 2004
Cognitive Psychology, 2002,3,4,5, 7,11

George Mason University

Graduate

Cognitive Science, 2001
Experimentation on the Internet, 2000
Psychology of Scientific Visualizations, 1999

Undergraduate

Cognitive Psychology, 2000
Memory & Cognition, 1998, 99, 2001

GRADUATE STUDENTS & POSTDOCS

Graduate student advisees

Prior

Kwangsu Cho, Psy, PhD 2005 (Sungkyunkwan, Korea)
Lelyn Saner, Psy, PhD 2008 (CASL)
Anthony Harrison, Psy, PhD 2008 (NRL)
Xiaohui Kong, ISP, PhD 2009 (UTHMC)
Melissa Patchan, Psy, PhD 2011 (Antwerp)
Eli Silk, Cognitive Studies 2011 (Michigan)

Current

Jooyoung Jang, Psy
Sam Abramovich, LSAP
Joel Chan, Psy
Megan Bathgate, Psy
Allison Liu, Psy
Anita Schuchardt, LSAP

Postdoc advisees

Prior

Brad Morris 2001-2 (GVSU)
Laura Moin 2003-5 (UC Boulder)
Yaron Doppelt 2003-5 (Technion)
Matt Mehalik 2003-5 (Sustainable Pittsburgh)
Xornam Apedoe 2005-8 (U of San Francisco)
Michelle Ellefson 2005-7 (Cambridge Univ)
Jarrod Moss 2007-8 (Miss State)
Alicia Chang 2008-10 (UDel)
Susannah Paletz, 2008-11 (U of Pittsburgh)

Current

Louis Alfieri, Adar Ben-Eliyahu, Charles Cox,
Amanda Crowell, Arava Kallai, Samuel King,
Matty Lau, Jordan Lippman, Li Sha

EDITED VOLUMES

1. Derry, S. J., Schunn, C. D., & Gernsbacher, M. A. (Eds.), (2005). *Interdisciplinary Collaboration: An Emerging Cognitive Science*. Mahwah, NJ: Erlbaum.
2. Schunn, C. D., Lovett, M. C., Munro, P., & Lebiere, C. (Eds.) (2004). *Proceedings of the 2004 Sixth International Conference on Cognitive Modeling*. Mahwah, NJ: Erlbaum.
3. Gray, W. D., & Schunn, C. D. (Eds.) (2002). *Proceedings of the 24th Annual Meeting of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
4. Altmann, E. M., Cleeremans, A., Schunn, C. D., & Gray, W. D. (Eds.) (2001). *Proceedings of the 2001 Fourth International Conference on Cognitive Modeling*. Mahwah, NJ: Erlbaum.
5. Crowley, K., Schunn, C. D., & Okada, T. (Eds.) (2001). *Designing for Science: Implications from Professional, Instructional, and Everyday Science*. Mahwah, NJ: Erlbaum.

JOURNAL ARTICLE AND BOOK CHAPTER PUBLICATIONS

(* = students & postdocs)

1. Jang, J.,* & Schunn, C. D. (in press). Physical design tools support and hinder innovative engineering design. *Journal of Mechanical Design*.
2. Xiong, W.,* Litman, D., & Schunn, C. D. (in press). Redesigning peer review interactions using computer tools. *Journal of Writing Research*.

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3. Bathgate, M.* Sims-Knight, J., & Schunn, C. D. (in press). Thoughts on thinking: Engaging novice music students in metacognition. *Applied Cognitive Psychology*.
 4. Jang, J.* & Schunn, C. D. (in press). Performance benefits of spatially distributed vs. stacked information on integration tasks. *Applied Cognitive Psychology*.
 5. Paletz, S. B. F.* & Schunn, C. D. (in press). Digging into implicit/explicit states and processes: The case of cognitive/social process interaction in scientific groups. To appear in R. Proctor and J. Capaldi (Eds.), *Psychology of Science: Implicit and Explicit Processes*. Oxford University Press.
 6. Apedoe, X.* & Schunn, C. D. (in press). Strategies for Success: Uncovering what makes students successful in design and learning. *Instructional science*.
 7. Apedoe, X.* Ellefson, M. E.* & Schunn, C. D. (2012). Learning together while designing: Does group size make a difference? *Journal of Science Education and Technology*, 21(1), 83-94.
 8. Abramovich, S.* & Schunn, C. D. (2012). Studying teacher selection of resources in an ultra-large scale interactive system: Does metadata guide the way? *Computers & Education*, 58(1), 551-559.
 9. Schunn, C. D., Silk, E. M.* & Apedoe, X. S.* (2012). Engineering in and for science education. In S. M. Carver and J. Shrager (Eds.), *The journey from child to scientist: Integrating cognitive development and the education sciences*. Washington, DC: APA Press.
 10. Moss, J., Schunn C.D., Schneider, W., McNamara, D. S., & VanLehn, K. (2011). The neural correlates of strategic reading comprehension: cognitive control and discourse comprehension. *NeuroImage*, 58(2), 675-686.
 11. Paletz, S. B. F.* Schunn, C. D., & Kim, K. (2011). Intragroup conflict under the microscope: micro-conflicts in naturalistic team discussions. *Negotiation and Conflict Management Research*, 4, 314-351.
 12. Schunn, C.D., & Silk, E. M.* (2011). Learning theories for engineering technology and engineering education. In M. Barak and M. Hacker (Eds.), *Fostering Human Development through Engineering and Technology Education*. Sense Publishers.
 13. Chan, J.* Fu, K.* Schunn, C. D., Cagan, J., Wood, K., & Kotovsky, K. (2011). On the benefits and pitfalls of analogies for innovative design: Ideation performance based on analogical distance, commonness, and modality of examples. *Journal of Mechanical Design*, 133, 081004-1-11.
 14. Kaufman, J. H.* & Schunn, C. D. (2011). Students' perceptions about peer assessment for writing: Their origin and impact on revision work. *Instructional Science*, 39(3), 387-406.
 15. Paletz, S. B. F.* & Schunn, C. D. (2011). Assessing group level participation in fluid teams: Testing a new metric. *Behavior Research Methods*, 10.3758/s13428-011-0070-3.
 16. Jang, J.* Schunn, C.D., & Nokes, T. J. (2011). Spatially distributed instructions improve learning outcomes and efficiency. *Journal of Educational Psychology*, 103(1), 60-72.
 17. Lee, C. J., & C. D. Schunn (2011). Social Biases and Solutions for Procedural Objectivity. *Hypatia*, 26(2), 352-373.
 18. Patchan, M. M.* Schunn, C.D., & Clark, R. J. (2011). Writing in natural sciences: Understanding the effects of different types of reviewers on the writing process. *Journal of Writing Research*, 2(3), 365-393.
 19. Lee, C. J., & C. D. Schunn (2010). Philosophy Journal Practices and Opportunities for Bias. *American Philosophical Association Newsletter on Feminism and Philosophy*, 10(1), 5-10.
 20. Linsey, J.* Tseng, I.* Fu, K.* Cagan, J., Wood, K., & Schunn, C. D. (2010). A study of design fixation, its mitigation and perception in engineering design faculty. *Journal of Mechanical Design*, 132(4), 041003-1-12.
 21. Nokes, T. J., Schunn, C. D., & Chi, M. T. H. (2010). Problem solving and human expertise. In E. Baker, B. McGraw, & P. Peterson (Eds.), *International Encyclopedia of Education*, Third Edition. Oxford, UK: Elsevier.
 22. Singh, C., Moin, L., & Schunn, C. D. (2010). Introduction to physics teaching for science and engineering undergraduates. *Journal of Physics Teacher Education Online*, 5(3), 3-10.
 23. Kong, X.* Schunn, C. D., Wallstrom, G. L. (2010). High regularities in eye-movement patterns reveal the dynamics of visual working memory allocation mechanism. *Cognitive Science*, 34(2), 322-337.
 24. Schunn, C. D. (2010). From uncertainly exact to certainly vague: Epistemic uncertainty and approximation in science and engineering problem solving. In B. Ross (Ed.), *Psychology of Learning and Motivation (Vol. 53)*, p. 227-252. Burlington: Academic Press.
 25. Cho, K.* & Schunn, C. D. (2010). Developing writing skills through students giving instructional explanations. In M. K. Stein & L. Kucan (Eds.), *Instructional Explanations in the Disciplines: Talk, Texts and Technology*. New York: Springer.
 26. Schunn, C. D., Lovell, M. R., Wang, Y.* & Yang, A.* (2010). Measuring innovative apples and oranges: Towards more robust and efficient measures of product innovation. In J. Gero (Ed.), *Studying Design Creativity*. Springer.
 27. Silk, E. M.* Higashi, R.* Shoop, R., Schunn, C. D. (2010). Designing technology activities that teach mathematics. *The Technology Teacher*, 69(4), 21-27.
 28. Paletz, S. B. F.* & Schunn, C. (2010). A social-cognitive framework of multidisciplinary team innovation. *Topics in Cognitive Science*, 2, 73-95.
 29. Singh, C., & Schunn, C. D. (2009). Connecting three pivotal concepts in K-12 science state standards and maps of conceptual growth to research in physics education. *Journal of Physics Teacher Education Online*, 5(2), 16-28.
 30. Christensen, B. T.* & Schunn, C. D. (2009). The role and impact of mental simulation in design. *Applied Cognitive Psychology*, 23, 327-344.
 31. Doppelt, Y.* Schunn, C. D., Silk, E. M.* Mehalik, M.* Reynolds, B.* & Ward, E.* (2009). Evaluating the impact of a facilitated learning community approach to professional development on teacher practice and student achievement. *Research in Science & Technological Education*, 27(3), 339-354.
 32. Nelson, M. M.* & Schunn, C. D. (2009). The nature of feedback: How different types of peer feedback affect writing performance. *Instructional Science*, 27(4), 375-401.
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33. Steinberg, D.*, Patchan, M.*, Schunn, C. D., Landis, A. (2009). Determining adequate information for green building occupant training materials. *Journal of Green Building*, 4(3), 143-150.
 34. Patchan, M. M.*, Charney, D., & Schunn, C. D. (2009). A validation study of students' end comments: Comparing comments by students, a writing instructor, and a content instructor. *Journal of Writing Research*, 1(2), 124-152.
 35. Reynolds, B.*, Mehalik, M. M.*, Lovell, M. R., & Schunn, C. D. (2009). Increasing student awareness of and interest in engineering as a career option through design-based learning. *International Journal of Engineering Education*, 25(1), 788-798.
 36. Schunn, C. D. (2009). How kids learn engineering: The cognitive science perspective. *The Bridge*, 39(3), 32-37.
 37. Silk, E. M.*, Schunn, C. D., & Shoop, R. (2009). Synchronized robot dancing: Motivating efficiency and meaning in problem solving with robotics. *Robot Magazine*, 17, 42-45.
 38. Silk, E. M.*, Schunn, C. D., & Strand-Cary, M.* (2009) The impact of an engineering design curriculum on science reasoning in an urban setting. *Journal of Science Education and Technology*, 18(3), 209-223.
 39. Steinberg, D.*, Patchan, M.*, Schunn, C. D., Landis, A. (2009). Developing a focus for green building occupant training materials. *Journal of Green Building*, 4(2), 175-184.
 40. Trickett, S. B*, Trafton, J. G., & Schunn, C. D. (2009). How do scientists respond to anomalies? Different strategies used in basic and applied science. *Topics in Cognitive Science*, 1(4), 711-729.
 41. Christensen, B. T.*, & Schunn, C. D. (2009). Setting a limit to randomness [or: 'Putting blinkers on a blind man']: Providing cognitive support for creative processes with environmental cues. In K. Wood & A. Markman (Eds.), *Tools for Innovation*. Oxford University Press.
 42. Schunn, C. D. & Nelson, M. M.* (2008). Expert-novice studies: An educational perspective. In E. M. Anderman (Ed.), *Psychology of Classroom Learning: An Encyclopedia*. Detroit, MI: Macmillan Reference.
 43. Schunn, C. D., (2008). John Robert Anderson biography. In E. M. Anderman (Ed.), *Psychology of Classroom Learning: An Encyclopedia*. Detroit, MI: Macmillan Reference.
 44. Apedoe, X.*, Reynolds, B.*, Ellefson, M. R.*, & Schunn, C. D. (2008). Bringing engineering design into high school science classrooms: The heating/cooling unit. *Journal of Science Education and Technology*, 17(5), 454-465.
 45. Cho, K.*, Chung, T. R.*, King, W. R., & Schunn, C. D. (2008). Peer-based computer-supported knowledge refinement: An empirical investigation. *Communications of the ACM*, 51(3), 83-88.
 46. Doppelt, Y.* & Schunn, C. D. (2008). Identifying students' perceptions of the important classroom features affecting learning aspects of a design based learning environment? *Learning Environments Research*, 11(3), 195-209.
 47. Doppelt, Y.*, Mehalik, M. M.*, Schunn, C. D., & Krysiniski, D. (2008). Engagement and achievements in design-based learning. *Journal of Technology Education*, 19(2), 22-39.
 48. Ellefson, M.*, Brinker, R., Vernacchio, V., & Schunn, C. D. (2008). Design-based learning for biology: Genetic engineering experience improves understanding of gene expression. *Biochemistry and Molecular Biology Education*, 36, 292-298.
 49. Mehalik, M. M.*, & Doppelt, Y.*, & Schunn, C. D. (2008). Middle-school science through design-based learning versus scripted inquiry: Better overall science concept learning and equity gap reduction. *Journal of Engineering Education*, 97(1), 71-85.
 50. Schunn, C. D. (2008). Engineering educational design. *Educational Designer*, 1.
<http://www.educationaldesigner.org/ed/volume1/issue1/article2/index.htm>
 51. Cho, K.*, & Schunn, C. D. (2007). Scaffolded writing and rewriting in the discipline: A web-based reciprocal peer review system. *Computers and Education*, 48(3), 409-426.
 52. Christensen, B. T.*, & Schunn, C. D. (2007). The relationship of analogical distance to analogical function and pre-inventive structure: The case of engineering design. *Memory & Cognition*, 35(1), 29-38.
 53. Kong, X.*, & Schunn, C. D. (2007). Global vs. local information processing in visual/spatial problem solving: The case of traveling salesman problem. *Cognitive Systems Research*, 8(3), 192-207.
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 86. Schunn, C. D., & Anderson, J. R. (1999). The generality / specificity of expertise in scientific reasoning. *Cognitive Science*, 23(3), 337-370.
 87. Reder, L. M., & Schunn, C. D. (1999). Bringing together the psychometric and strategy worlds: Predicting adaptivity in a dynamic task. In D. Gopher and A. Koriat (Eds.), *Cognitive regulation of performance: Interaction of theory and application. Attention and Performance XVII* (pp. 315-342). Cambridge, MA: MIT Press.
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 91. Schunn, C. D., & Klahr, D. (1998). Production systems: Views on intelligent behavior. In W. Bechtel and G. Graham (Eds.), *A Companion to Cognitive Science* (pp. 542-551). Malden, MA: Blackwell.
 92. Schunn, C. D., Reder, L. M., Nhouyvanisvong, A.*, Richards, D. R.*, & Stroffolino, P.J.* (1997). To calculate or not calculate: A source activation confusion (SAC) model of problem-familiarity's role in strategy selection. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 23(1), 3-29.
 93. Schunn, C. D., & Dunbar, K. (1996). Priming, analogy, and awareness in complex reasoning. *Memory & Cognition*, 24(3), 271-284.
 94. Reder, L. M., & Schunn, C. D. (1996). Metacognition does not imply awareness: Strategy choice is governed by implicit learning and memory. In L. M. Reder (Ed.), *Implicit memory and metacognition* (pp. 45-78). Mahwah, NJ: Erlbaum.
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INVITED TALKS

1. Learning to argue scientifically using computer and web-based peer feedback. Invited talk the *LTAC Frontier Lecture Series*, Texas A&M University, February 2012.
2. Obtaining Wisdom via Scaffolded Peer Review. Invited talk at the *iSchool Colloquium Series*, University of Pittsburgh, December, 2011.
3. Science Learning Activation: A New Framework for Building Gender Equity. Invited talk at Ewha Womans University, Seoul, South Korea, April, 2011
4. On the Benefits and Pitfalls of Analogies for Innovative Design. Invited talk at Sungkyunkwan University, Department of Interactional Studies, Seoul, South Korea, March, 2011
5. Design Principles for Adding Game-like Features to Robo Math. Invited talk at the *Center for Advanced Technology in Schools (CATS) Workshop For Research on Games and Learning*, Los Angeles, CA, January, 2011
6. What Makes Engineering Teams Succeed? Better Consideration of Options. Invited talk at the *3rd biennial conference of the International Society for Psychology of Science and Technology*, Berkeley, CA, August, 2010
7. What does it mean for cognitive psychologists to study groups of scientists at work?: The interplay of cognitive and social processes. Invited talk at the *2nd Purdue Symposium on Psychological Sciences*, West Lafayette, IN, June, 2010
8. Standards in K-12 Tech Literacy and Engineering: Implications for Design and Research. Invited symposium presentation at the *2009 NSF DR-K12 PI Meeting*. Washington, DC, November, 2009
9. Engineering in / & / or / for science education. Invited talk at the *2009 Carnegie Symposium From Child to Scientist: Mechanisms of Learning and Development*. Pittsburgh, PA, October, 2009
10. Peer Reviewers as Effective Audience, Teacher, and Learner. Keynote speaker to the *Fifth Biennial Conference of the European Association for the Teaching of Academic Writing*. Coventry, England, July, 2009
11. Diving deeper into the black box: Sampling from automated video collection to understand what influences innovation processes. Invited symposium presentation at *Advancing the Study of Innovation and Globalization in Organizations*. Nuremberg, Germany, July, 2009
12. Learning Experiment Design and Analysis from Worked Examples. Invited symposium presentation at the *Council of Science Editors 52nd Annual Meeting*. Pittsburgh, PA, May, 2009
13. From Tools to Innovation: What Cognitive Processes Lie in Between? Invited talk at the *Purdue Mechanical Engineering Graduate Seminar*. West Lafayette, IN, December, 2008
14. Analogies Between Science and Design: What Models of Science Can Learn from Models of Engineering Design? Invited talk given at the *Symposium on Computational Approaches to Creativity in Science*. Palo Alto, CA, March, 2008
15. The Science of Educational Reform: The Case of Writing in the Disciplines, Keynote talk to the *2008 Educational Research Exchange*. Kent, OH, March, 2008
16. Do Universities Teach Thinking? Invited talk at the *Kent State Learning Communities Series*. Kent, OH, October, 2004
17. Learning to be a good reviewer through scaffolded classroom-based reciprocal evaluation. Invited min-session presentation to the *2004 APA Education Leadership Conference*. Washington, DC, September, 2004
18. Using model-based reasoning in psychology education. Invited plenary panel presentation to the *2004 APA Education Leadership Conference*. Washington, DC, September, 2004
19. Models of seeing with visualizations. Invited panel presentation at the *Human Systems Integration Symposium*. Newport, RI, May, 2004
20. Supporting collaborative scientific discovery. Invited talk at the *NASA Information Science HCC review meeting*. Pittsburgh, PA, March, 2003
21. On the value of fitting models to data. Paper presented at the *Digital Human Modeling for Design and Engineering Conference*. Crystal City, VA, June, 2001
22. Psychologist in a box: Capturing the skills of the expert scientist using ACT-R. Invited talk given at the *Navy Center for Applied Research in Artificial Intelligence Seminar Series*, Naval Research Lab, October, 2000
23. Mechanisms of adaptivity: Insights from dogs who can't learn new tricks. Invited talk given to the *Psychology Department Lecture Series*, University of Maryland, College Park, September, 2000
24. What makes collaborations across a distance succeed?: The case of the Cognitive Science community. Invited talk given to the Psychology Institute, Basel, Switzerland, July, 2000
25. Now they see the point: Improving science reasoning through making predictions. Invited talk given to the Psychology Institute, Basel, Switzerland, July, 2000
26. What gestures reveal about the scientist's mind. Invited talk given at the Krasnow Institute Lecture Series, Fairfax, VA, November, 1999
27. Acquiring expertise in science: What, when, and how. Invited talk given to the Psychology Institute, Basel, Switzerland, June, 1998

CONFERENCE PRESENTATIONS & PUBLICATIONS

1. Sha, L., Schunn, C. D., & Bathgate, M. (2012, April). Activated science learners as self-regulation agents. Poster presented at presented at the *Annual Meeting of the American Educational Research Association*, Vancouver, Canada.
2. Nagy Catz, K., Crowell, A., Burmester, K. O., Schunn, C. D., & Dorph, R. (2012, April). Scientific sense making in context. Poster presented at presented at the *Annual Meeting of the American Educational Research Association*, Vancouver, Canada.
3. King, S. O., Stein, M. K., Schunn, C. D., & Boston, M. D. (2012, April). Designing educative teacher guides for informal learning. Paper presented at presented at the *Annual Meeting of the American Educational Research Association*, Vancouver, Canada.
4. Lau, M., Stein, M. K., Reynolds, B. S., Schunn, C. D., Ruppel, R., Cox, C. D., & Bender, S. (2012, April). Paper presented at presented at the *Annual Meeting of the American Educational Research Association*, Vancouver, Canada.
5. Cox, C., Reynolds, B., Schuchardt, A., & Schunn, C. (2012, April). Get the lazy math hiding in secondary biology curricula to do some work for a change. Paper presented at the *2nd P-12 Engineering and Design Research Summit*, Washington, DC.
6. Verstynen, T. D., Workman, B., Braun, E., Phillips, J., Schunn, C., & Schneider, W. (2011, November). The behavioral, neurophysiological and anatomical changes following long-term motor skill learning. Poster presented at the *Society for Neuroscience*, Washington, DC.
7. Kallai, A. Y., Schunn, C. D., & Fiez, J. A. (2011, November). An fMRI study of Arithmetic training: different activation patterns of basal ganglia due to differences in training procedures. Poster presented at the *52nd Annual Meeting of the Psychonomic Society*, Seattle, WA.
8. Kallai, A. Y., Schunn, C. D., Ponting, A. L., & Fiez, J. A. (2011, September). Improving foundational number representations through simple arithmetical training. Paper presented at the *Fall 2011 Research Conference of the Society for Research in Educational Effectiveness*, Washington, DC.
9. Alfieri, L., Nokes, T. J., & Schunn, C. D. (2011, September). Aligning the structural components across learning tasks of case comparisons. Paper presented at the *Fall 2011 Research Conference of the Society for Research in Educational Effectiveness*, Washington, DC.
10. Jang, J., & Schunn, C. D. (2011, September). Physical design tools support and hinder innovative engineering design. Paper presented at the *Human Factors and Ergonomics Society's 55th Annual Meeting*, Las Vegas, NV.
11. Egan, P., LeDuc, P., Cagan, J., & Schunn, C. (2011, August). A design exploration of genetically engineered myosin motors. Paper presented at the *37th Design Automation Conference*, Washington, DC.
12. Krager, J., Wood, K., Crawford, R., Jensen, D., Cagan, J., Schunn, C., Linsey, J., & White, C. (2011, August). Understanding innovation: A study of perspectives and perceptions in engineering. Paper presented at the *ASME 2011 International Design Engineering Technical Conference*, Washington, DC.
13. Chan, J.C.S., Fu, K., Schunn, C. D., Cagan, J., Wood, K., & Kotovsky, K. (2011, August). On the effective use of design-by-analogy: The influences of analogical distance and commonness of analogous designs on ideation performance. Paper presented at the *18th International Conference on Engineering Design*, København, Denmark.
14. Paletz, S. B., & Schunn, C. D. (2011, August). Unpacking Problem-Solving Conversations: When Conflict Sparks Analogies. Paper presented at the *Academy of Management Annual Meeting*, San Antonio, TX.
15. Moss, J., Schunn, C. D., Schneider, W. S., McNamara, D. (2011, July). An fMRI study of zoning out during strategic reading comprehension. Poster presented at the *33rd Annual Meeting of the Cognitive Science Society*, Boston, MA.
16. Jang, J., & Schunn, C. D. (2011, July). Student's adaptive choice of instruction format. Poster presented at the *33rd Annual Meeting of the Cognitive Science Society*, Boston, MA.
17. Schunn, C. D. & SLAL (2011, July). Public science literacy vs. science careers. Talk given at the conference on *Public Understanding and Public Engagement with Science*. New York, NY.
18. Silk, E. M., Higashi, R., & Schunn, C. D. (2011, June). Resources for Robot Competition Success: Assessing Math Use in Grade-School-Level Engineering Design. Paper presented at the *Annual Conference of the American Society for Engineering Education*. Vancouver, B.C., Canada (June, 2011).
19. Abramovich, S., Higashi, R., Hunkele, T., Schunn, C. D., & Shoop, R. (2011, June). An achievement system to increase achievement motivation. Papers presented at the *Games + Learning + Society Conference 7.0*, Madison, WI.
20. Silk, E. M., & Schunn, C. D. (2011, June). Computational versus mechanistic mathematics in propelling the development of physical knowledge. Paper presented at the *41st Annual Meeting of The Jean Piaget Society*, Berkeley, CA.
21. Bathgate, M., Brahm, L., Schunn, C. D., & Crowley, K. (2011, June). Capturing content and context effects on engagement with science learning. Paper presented at the *41st Annual Meeting of The Jean Piaget Society*, Berkeley, CA.
22. Schunn, C. D., Patchan, M. M., & Sieg, W. (2011, May). How and For Whom Does Accelerated Learning Work? The Case of the Open Learning Initiative Course - Logic & Proofs. Paper presented at the *Open Educational Resources 2011*, Manchester, UK.
23. Schunn, C. D., Richey, J. E., Alfieri, L. (2011, May). Contrasting cases can facilitate hands-on middle school science learning at scale. Symposium presentation at the *Association for Psychological Science 23rd Annual Convention*, Washington, DC.
24. Kallai, A., Ponting, A., Schunn, C.D., & Fiez, J.A. (2011, April). Critical constituents of reward-based learning in an arithmetic training. Poster presented at the *Eighteenth Annual Cognitive Neuroscience Society Meeting*, San Francisco, CA
25. Ellefson, M., Schunn, C.D., & Khamar, H. J. (2011, April). Are students' causal models of scientific ideas flexible? Symposium talk presented at the *Society for Research in Child Development 2011 Biennial Meeting*, Montreal, QC.
26. Silk, E., & Schunn, C.D. (2011, April). Resources for learning robots: facilitating the incorporation of mathematical models in students' Engineering Design Strategies. Talk presented at the *Annual Meeting of the American Educational Research Association*, New Orleans, LA.
27. Abramovich, S., & Schunn, C.D. (2011, March). Teachers Exchanging Materials in Web 2.0. Paper presented at the *Society for Information Technology & Teacher Education International Conference*, Nashville, TN.
28. Kallai, A., Ponting, A., Schunn, C. D., & Fiez, J. A. (2010, November). An arithmetical training regime improves number representation within HiPS and broad mathematical performance. Poster presented at the *51st Annual Meeting of the Psychonomic Society*, St. Louis, MI.
29. Jang, J., & Schunn, C. D. (2010, November). Benefits of spatially distributed rather than stacked information displays. Poster presented at the *51st Annual Meeting of the Psychonomic Society*, St. Louis, MI.
30. Kallai, A., Ponting, A., Schunn, C. D., & Fiez, J. A. (2010, November). An arithmetical training regime improves number representation within HiPS and broad mathematical performance. Poster presented at the *Society for Neuroscience*, San Diego, CA.
31. Apedoe, X. S., & Schunn, C. D. (2010, August). Strategies for Success in Design and Science Learning. Paper presented at the *P-12 Engineering and Design Education Research Summit*, Seaside, OR.
32. Moss, J., Schunn, C. D., Schneider, W., McNamara, D., VanLehn, K. (2010, August). An fMRI Study of Strategic Reading Comprehension. Paper presented at the *32nd annual meeting of the Cognitive Science Society*, Portland, OR.

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33. Richey, J. E., Chang, A., Nokes, T., & Schunn, C. D. (2010, August). Using analogical learning in science curricula to improve conceptual understanding. Poster presented at the 32nd annual meeting of the Cognitive Science Society, Portland, OR.
 34. Jang, J., & Schunn, C. D. (2010, August). Physical design tools support and hinder innovative engineering design. Poster presented at the 32nd annual meeting of the Cognitive Science Society, Portland, OR.
 35. Patchan, M. M., & Schunn, C. D. (2010, August). Impact of diverse abilities on learning to write through peer-review. Poster presented at the 32nd annual meeting of the Cognitive Science Society, Portland, OR.
 36. Chan, J., Fu, K., Schunn, C. D., Cagan, J., Kotovsky, K., & Wood, K. (2010, August). What makes for inspirational examples in design? The effects of example modality, distance, and familiarity. Poster presented at the 32nd annual meeting of the Cognitive Science Society, Portland, OR.
 37. Paletz, S. B. F., & Schunn, C. D., & Kim, K. H. (2010, August). Micro-conflicts in naturalistic team discussions: Measurement, correlates, and context. Symposium paper presented at the 2010 Academy of Management Meeting, Montreal, Quebec, Canada.
 38. Paletz, S. B. F., & Schunn, C. D., & Kim, K. H. (2010, July). Analogies can spark intra-group conflict in teams. Paper presented at the The Fifth Annual INGRoup Conference, Arlington, VA.
 39. Apedoe, X. S., Mattis, K., Rowden-Quince, B., & Schunn, C. D. (2010, July). Examining the role of verbal interaction in team success on a design challenge. In the *Proceedings of the 9th International Conference of the Learning Sciences*. Chicago, IL.
 40. Xiong, W., Litman, D., & Schunn, C. D. (2010, June). Assessing reviewer's performance based on mining problem localization in peer-review data. Paper presented at the Third International Conference on Educational Data Mining, Pittsburgh, PA.
 41. Xiong, W., Litman, D., & Schunn, C. D. (2010, June). Impact of Annotation Difficulty on Automatically Detecting Problem Localization of Peer-Review Feedback. Paper presented at the Workshop on Computer-Supported Peer Review in Education, Pittsburgh, PA.
 42. Paletz, S. B. F., & Schunn, C. D. (2010, May). The interaction between conflict and analogy in teams. Symposium presentation given at the 22nd Annual Convention of the Association for Psychological Science, Boston, MA.
 43. Schunn, C. D. (2010, May). Innovators' physical environment changes cognitive processes and innovation outcomes. Symposium presentation given at the 22nd Annual Convention of the Association for Psychological Science, Boston, MA.
 44. Chang, A., Nokes, T. J., & Schunn, C. D. (2010, April). Scaffolding middle school science learning with contrasting cases. Symposium presentation given at the 19th Annual Convention of the Western Psychological Association, Cancun, Mexico.
 45. Ponting, A., Kallai, A., Schunn, C. D., & Fiez, J. A. (2010, April). General improvements in mathematical ability via a basal ganglia learning mechanism. Poster presented at the Seventeenth Annual Cognitive Neuroscience Society Meeting, Montreal, Quebec, Canada.
 46. Kallai, A., Ponting, A., Schunn, C. D., & Fiez, J. A. (2010, April). An arithmetical training regime motivated by principles of basal ganglia function. Poster presented at the Seventeenth Annual Cognitive Neuroscience Society Meeting, Montreal, Quebec, Canada.
 47. Schunn, C. D., Merlino, J., Cromley, J., Massey, C., Newcombe, N., & Nokes, T. (2010, April). Translational Science of Cognitive Science in Middle School Science Curricula. Symposium talk presented at the Annual Meeting of the American Educational Research Association, Boston, MA.
 48. Abramovich, S.J. & Schunn, C.D. (2010, March). Using a Taxonomy of Design with Students. Talk presented at International Technology Education Association. Charlottes, NC.
 49. Patchan, M. M., Schunn, C. D., & Charney, D. (2010, March). Validating Students' End Comments. Talk presented at the Conference on College Composition and Communication, Louisville, KY
 50. Chang, A., Nokes, T., & Schunn, C. D. (2009, November). Using Cognitive Science to Improve Middle School Science Learning. Poster presented at the Annual Meeting of the Psychonomic Society, Boston, MA.
 51. Lee, C. J., & Schunn, C. D. (2009, October). Social Bases for Cognitive Critique: A Case Study of Peer Review in Philosophy. Talk presented at Feminist Legacies/ Feminist Futures: Hypatia 25th Anniversary Conference, Seattle, WA.
 52. Schunn, C. D., Moss, J., Huppert, T., & Schneider, W. (2009, October). Real-time NIRS feedback may help improve self-explanation learning strategy use. Talk presented at the Society for Neuroscience, Chicago, IL.
 53. Paletz, S. B. F., & Schunn, C. D. (2009, October). A new metric for assessing group level participation in fluid teams. Paper presented at the Atlanta Conference on Science and Innovation Policy, Atlanta, GA.
 54. Schunn, C. D. (2009, September). Diving deeper into the Blackbox: Sampling from automated video to understand the innovation process. Talk given at the Workshop on Confidential Data Collection for Innovation Analysis in Organizations, Redmond, WA.
 55. Paletz, S. B. F., Bearman, C. R., & Schunn, C. D. (2009, August). Intercoder reliability as shared mental models. Poster presented at the 2009 Academy of Management Meeting, Chicago, Illinois.
 56. Wong, T. J., Schunn, C. D., & Siegle, G. (2009, July). What our eyes can tell us about how an insight emerges? Poster presented at the 31st annual meeting of the Cognitive Science Society, Amsterdam, The Netherlands.
 57. Khamar, H. Ellefson, M., & Schunn, C.D. (2009, July). Causal parsimony in learning science. Poster presented at the 31st annual meeting of the Cognitive Science Society, Amsterdam, The Netherlands.
 58. Apedoe, X. S., & Schunn, C. D. (2009, April). Understanding How Students Solve Novel Design Challenges. Poster presented at the Annual Conference of the National Association for Research in Science Teaching. Los Angeles, CA.
 59. Khamar, H. J., Ellefson, M., & Schunn C. D. (2009, April). Is Reasoning About Chemistry Constrained by Causal Parsimony? Poster presented at the Society for Research in Child Development 2009 Biennial Meeting. Denver, CO.
 60. Paletz, S. B. F., & Schunn, C. (2009, February). Conflict and analogy in informal science teams. Paper presented at the Center for Interdisciplinary Research on Teams conference, Pittsburgh, PA.
 61. Wang, Y., Balaban, C., Bidanda, B., Schunn, C. D., Shuman, L., Sochats, K. (2008, October). Intelligent Strategy Decision Support System for Engineering Design. Paper presented at the INFORMS Annual Meeting 2008. Washington, DC.
 62. Moss, J., Schunn, C. D., VanLehn, K., Schneider, W., McNamara, D. S., & Jarbo, K. (2008, August). They Were Trained, But They Did Not All Learn: Individual Differences in Uptake of Learning Strategy Training. Poster presented at the 30th Annual Meeting of the Cognitive Science Society. Washington, DC.
 63. Titus, N., Schunn, C. D., Walhall, C., Chiu, G., & Ramani, K. (2008, April). What design processes predict better design outcomes? The case of robotics design teams. In the *Proceedings of the International Symposium series on Tools and Methods of Competitive Engineering*. Izmir, Turkey.
 64. Paletz, S. B. F., & Schunn, C. D. (2008, July). A socio-cognitive model of team innovation in science and engineering. Talk given at the 2nd Bi-Annual Conference of the International Society for the Psychology of Science & Technology. Berlin, Germany.
 65. Schunn, C. D. (2008, July). Epistemic uncertainty vs. approximation in science and engineering. Talk given at the 2nd Bi-Annual Conference of the International Society for the Psychology of Science & Technology. Berlin, Germany.
 66. Reynolds, B., Mehalik, M., Lovell, M., & Schunn, C. D. (2008, June). Lessons learned from a product realization RET site: Maximizing success for teacher research and high school student impact. Paper presented at the Annual Conference of the American Society for Engineering Education. Pittsburgh, PA.
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67. Silk, E., & Schunn, C. D. (2008, June). Using robotics to teach mathematics: Analysis of a curriculum designed and implemented. Paper presented at the *Annual Conference of the American Society for Engineering Education*. Pittsburgh, PA.
 68. Nelson, M. M. & Schunn, C. D. (2008, April). What Types of Comments Motivate Writers to Revise? Symposium talk presented at the *Conference on College Composition and Communication*. New Orleans.
 69. Charney, D., & Schunn, C. D. (2008, April). What do Readers and Writers Gain from Peer Review? A Call for Research. Symposium talk presented at the *Conference on College Composition and Communication*. New Orleans.
 70. Silk, E., & Schunn, C. D. (2008, April). Utilizing Contrasting Cases to Target Science Reasoning and Content in a Design-for-Science Unit. Paper presented at the *Annual Conference of the National Association for Research in Science Teaching*. Baltimore, MD.
 71. Kaufman, J., & Schunn, C. D. (2008, March). Student resistance to innovation: An investigation of undergraduate attitudes toward an online writing peer review and assessment system. Paper presented at the *Annual Meeting of the American Educational Research Association*. New York, NY.
 72. Schunn, C. D., Lovell, M. R., Wang, Y., and Yang, A. (2008, March). Measuring Innovative Apples & Oranges: Towards More Robust and Efficient Measures of Product Innovation. Paper presented at the *Studying Design Creativity* conference. Aix-en-Provence, France.
 73. Schunn, C. D., & Christensen, B. T. (2008, January). The Environment of Analogical Reasoning in Expert Conceptual Design. Talk given at the *NSF CMMI Workshop on Innovation*. Knoxville, TN.
 74. Ellefson, M. R., & Schunn, C. D. (2007, November). Can domain knowledge improve causal reasoning? Poster presented at *48th Annual Meeting of the Psychonomic Society Annual Meeting*. Long Beach, CA.
 75. Tollinger, I., Schunn, C., & Vera, A. H. (2007, August). From radical colocation to fully distant—how developed team expertise weathers the transition. Symposium talk presented at the *29th Annual Conference of the Cognitive Science Society*. Nashville, TN.
 76. Schunn, C. D. (2007, August). Avoiding fault lines in interdisciplinary collaboration. Symposium talk presented at the *29th Annual Conference of the Cognitive Science Society*. Nashville, TN.
 77. Schunn, C. D., Wong, T., Manzoul, W., Kamer, J., Harris, J., Traflet, J. G., & Trickett, S. B. (2007, August). Detecting and Resolving Informational Uncertainty in Complex Domains. In the *Proceedings of the 29th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 78. Cho, K., Schunn, C. D., & Kwon, K. (2007, July). Learning writing by reviewing in science. Poster presented at *Computer Support Collaborative Learning 2007*. New Brunswick, NJ.
 79. Doppelt, Y., Schunn, C. D., Silk, E. M., & Mehalik, M. M. (2007, June). Evaluating the impact of professional development on teacher practice and student achievement. Paper presented at the *Fifth International Teacher Education at a Crossroads*. Tel-Aviv, Israel.
 80. Doppelt, Y., Schunn, C. D., & Silk, E. M. (2007, June). Implementing embedded assessment as a tool for identifying misconceptions. Paper presented at the *Fifth International Teacher Education at a Crossroads*. Tel-Aviv, Israel.
 81. Kong, X., & Schunn, C. D. (2007, June). Information seeking in complex problem solving. In the *Proceedings of the 8th International Conference on Cognitive Modeling*. Ann Arbor, MI.
 82. Silk, E., Schunn, C. D., & Carey, M. S. (2007, April). Evaluating A Design-Based Learning Curriculum in Terms of Students' Science Reasoning Gains. Paper presented at the *National Association for Research in Science Teaching*. New Orleans, LA.
 83. Apedoe, X. S., & Schunn, C. D. (2007, April). Investigating the Tacit Problem-Solving Strategies of Novice Designers: Implications for Science Teaching and Learning. Poster presented at the *National Association for Research in Science Teaching*. New Orleans, LA.
 84. Schunn, C. D., Raghavan, K., & Cho, K. (2007, April). Domain-General Learning Accelerators in Middle-School Science. Symposium talk presented at the *Annual Meeting of the American Educational Research Association*. Chicago, IL.
 85. Moin, L. J., & Schunn, C. D. (2007, April). Some Elements to Design Effective Math and Science Teacher Recruitment Programs. Paper presented at the *Annual Meeting of the American Educational Research Association*. Chicago, IL.
 86. Charney, D., Nelson, M. M., & Schunn, C. D. (2007, March). How and How Helpfully Do Peers Comment on Student Writing? Symposium talk presented at the *Conference on College Composition and Communication*. New York, NY.
 87. Schunn, C. D., & Christensen, B. T. (2006, December). Trading-Off Analogical and Quantitative Reasoning in Expert Conceptual Design. Talk presented at the *Tools for Innovation Workshop*. Austin, TX.
 88. Schunn, C. D., Saner, L. D., Traflet, J. G., Trickett, S. B., & Kirschenbaum, S. K. (2006, November). The Evolution of Spatial Representations During Complex Visual Data Analysis. Talk presented at *47th Annual Meeting of the Psychonomic Society Annual Meeting*. Houston, TX.
 89. Tollinger, I., Schunn, C. D., & Vera, A. H. (2006). What changes when a large team becomes more expert? In the *Proceedings of the 28th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 90. Kong, X., & Schunn, C. D. (2006). Global vs. local information processing in problem solving: A study of the traveling salesman problem. In the *Proceedings of the 7th International Conference on Cognitive Modeling*. Trieste, Italy.
 91. Doppelt, Y., Silk, E., Mehalik, M., Schunn, C. D., & Reynolds, B. (2006). Evaluating the Impact of a Facilitated Learning Community Approach to Professional Development on Student Achievement. Paper presented at *National Association for Research on Science Teaching Annual Meeting*. San Francisco, CA, (April, 2006)
 92. Moin, L., & Schunn, C. D. (2006) Elements for Successful Teacher Recruitment Strategies Reported by SEM Undergraduates with and without Teaching Experiences. Paper presented at *National Association for Research on Science Teaching Annual Meeting*. San Francisco, CA (April, 2006).
 93. Tollinger, I., Schunn, C. D., & Vera, A. H. (2006). What Changes When a Large Team Becomes More Expert? Analyses of Speed-Up in the Mars Exploration Rovers Science Planning Process. Paper presented at the *Human Computer Interaction Consortium*. Frasier, CO (February, 2006).
 94. Moin, L., & Schunn, C. D. (2006). Elements to build more effective teacher recruitment programs among math, science, and engineering undergraduates. Paper presented at the *Association for the Education of Teachers of Science International Conference*. Portland, OR (January, 2006).
 95. Morris, B. J., & Schunn, C. D. (2005). Encoding problem features in logical reasoning. Poster presented at the *Biennial Meeting of the Society for Research in Child Development*. Atlanta, GA (April, 2005).
 96. Abar, B., Winsler, A., Feder, M., & Schunn, C. D. (2005). Private speech and executive functioning in children with autistic spectrum disorders and ADHD. Poster presented at the *Biennial Meeting of the Society for Research in Child Development*. Atlanta, GA (April, 2005).
 97. Mehalik, M. M., Doppelt, Y., & Schunn, C. D. (2005). Addressing performance and equity of a design-based, systems approach for teaching science in eighth grade. Paper presented at the *Annual Meeting of the American Educational Research Association*. Montreal, Canada. (April, 2005).
 98. Schunn, C. D. (2005). Targeted studies: Immersion, learning, and equity. Symposium talk presented at the *Annual Meeting of the American Educational Research Association*. Montreal, Canada. (April, 2005).
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99. Moin, L. J., Dorfield, J., & Schunn, C. D. (2005). Prior teaching experiences' influence on k-12 math/science teaching interest: Analyses of direct and indirect effects. Paper presented at the *Annual Meeting of the American Educational Research Association*. Montreal, Canada. (April, 2005).
 100. Doppelt, Y., Mehalik, M. M., & Schunn, C. D. (2005). A close-knit collaboration between researchers and teachers for developing and implementing a design-based science module. Paper presented at *National Association for Research on Science Teaching Annual Meeting*. Dallas, TX. (April, 2005).
 101. Raghavan, K., Sartoris, M., & Schunn, C. D. (2005). Middle-school students' perceptions and interpretations of different model types. Paper presented at *National Association for Research on Science Teaching Annual Meeting*. Dallas, TX. (April, 2005).
 102. Moin, L. J., Dorfield, J., & Schunn, C. D. (2005). Where can we find future k-12 science and math teachers? A search by academic year, discipline, and achievement level. Paper presented at the *Association for the Education of Teachers of Science International Conference*. Colorado Springs, CO. (January, 2005).
 103. Schunn, C. D., & Saner, L. D. (2004). Thinking about uncertain data: How scientists represent uncertainty in their data. Paper presented at the *45th Annual Meeting of the Psychonomic Society*. Minneapolis, MN (November, 2004).
 104. Mehalik, M. M., Doppelt, Y., & Schunn, C. D. (2004). A systems approach for design-based learning. *International Conference on Engineering Education*, Gainesville FL (October, 2004).
 105. Schunn, C. D., Saner, L. D., & Harrison, A. H. (2004). The role of gestures in a theory of spatial representation. Symposium talk presented at the *26th Annual Conference of the Cognitive Science Society*. Chicago, IL (August, 2004).
 106. Harrison, A., & Schunn, C. D. (2004). The transfer of logically general scientific reasoning skills. In the *Proceedings of the 26th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 107. Doppelt, Y., & Schunn, C. D. (2004). What is your science classroom like? Poster presented at the *Sixth International Conference of the Learning Sciences*, Los Angeles, CA (June, 2004).
 108. Weiss, D. J., & Schunn, C. (2003). Evaluating peer evaluation of writing. Paper presented at the International Meeting of the Brunswik Society, Vancouver (November, 2003).
 109. Cho, K., & Schunn, C. D. (2003). Seven factors that make learning successful in networked collaboration. Poster presented at *25th Annual Conference of the Cognitive Science Society*. Boston, MA (August, 2003).
 110. Christensen, B., & Schunn, C. D. (2003). Returning to unsolved creative problems. Poster presented at *25th Annual Conference of the Cognitive Science Society*. Boston, MA (August, 2003).
 111. Morris, B., & Schunn, C. D. (2003). *Strategically logical*. Poster presented at *25th Annual Conference of the Cognitive Science Society*. Boston, MA (August, 2003).
 112. Cho, K., & Schunn, C. D. (2003). Battling the Tyranny of the Thousands with a SWoRD: Scaffolded Writing and Rewriting in the Discipline. Paper presented at *ED-Media*. Honolulu, HI (July, 2003).
 113. Harrison, A., & Schunn, C. D. (2003). ACT-R/S: Look MA, No "Cognitive map"! In the *Proceedings of the 5th International Conference on Cognitive Modeling*. Bamberg, Germany: Universitäts-Verlag Bamberg.
 114. Schunn, C. D., & Harrison, A. (2003). *Segmented spaces: Coordinated Perception of Spaces in ACT-R*. Symposium talk presented at the *5th International Conference on Cognitive Modeling*. Bamberg, Germany (April, 2003).
 115. McGregor, M. U., Palmquist, S. D., Schunn, C. D., & Crowley, K. (2003). Capturing child dinosaur expertise with computationally specified input encoding. Poster presented at the *5th International Conference on Cognitive Modeling*. Bamberg, Germany (April, 2003).
 116. Schunn, C. D., & Morris, B. J. (2002). Empirical demonstration of logical strategy. Paper presented at the *43rd Annual Meeting of the Psychonomic Society*. Kansas City, MO (November, 2002).
 117. Schunn, C. D., & Cho, K. (2002). A web-based system for reciprocal evaluation of student paper writing. Paper presented at the *32nd Annual Meeting of the Society for Computers in Psychology*. Kansas City, MO (November, 2002).
 118. Harrison, A., & Schunn, C. D. (2002). ACT-R/S: A computational and neurologically inspired model of spatial reasoning. Poster presented at *24th Annual Conference of the Cognitive Science Society*. Fairfax, VA (August, 2002).
 119. Harrison, A., Saner, L., & Schunn, C. D. (2002). Using Latent Semantic Analysis for diagnosing strategy use in open text responses. Poster presented at *24th Annual Conference of the Cognitive Science Society*. Fairfax, VA (August, 2002).
 120. Altmann, E. M., & Schunn, C. D. (2002). Integrating Decay and Interference: A New Look at an Old Interaction. In the *Proceedings of the 24th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 121. Cho, K., Schunn, C. D., & Lesgold, A. (2002). Comprehension monitoring and regulation in collaboration. In the *Proceedings of the 24th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 122. Morris, B. J., & Schunn, C. D. (2002). Logical Strategy. In the *Proceedings of the 24th Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 123. Saner, L., & Schunn, C. D. (2002). Let me tell you why that is a bad analogy: The role of prior beliefs in processing analogical arguments. Poster presented at *24th Annual Conference of the Cognitive Science Society*. Fairfax, VA (August, 2002).
 124. Shiflett, K., Winsler, A., & Schunn, C. (2002). Parenting style and parenting stress among children with executive and self-regulatory problems. Poster presented at the *Biennial Conference on Human Development*. Charlotte, NC (April 2002).
 125. Feder, M., Winsler, A., & Schunn, C. (2002). Executive functioning in children with ADHD, High Functioning Autism, and controls: Parent report and Tower of Hanoi performance. Poster presented at the *Biennial Conference on Human Development*. Charlotte, NC. (April 2002)
 126. Littleton, C. D., Schunn, C. D., & Kirschenbaum, S. S. (2001). Sub space: Describing distant psychological space. Poster presented at *23rd Annual Conference of the Cognitive Science Society*. Edinburgh, Scotland (August, 2001).
 127. Schunn, C. D., & Harrison, A. (2001). ACT-RS: A neuropsychologically inspired module for spatial reasoning. Poster presented at the *4th International Conference on Cognitive Modeling*. Fairfax, VA (July, 2001).
 128. Trickett, S. B., Trafton, J. G., Schunn, C. D., & Harrison, A. (2001). "That's odd!" How scientists respond to anomalous data. In the *Proceedings of the 23rd Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 129. Schunn, C. D., Trickett, S. B., Trafton, J. G., & Harrison, A. (2001). Framework anomalies in visual scientific data. Paper presented at the *Cognitive Studies of Science and Technology Workshop*. Charlottesville, VA (April, 2001).
 130. Schunn, C. D. (2000). Cross-task stability of individual differences in adaptivity to changing base rates. Paper presented at the *41st Annual Meeting of the Psychonomic Society*. New Orleans, LA (November, 2000).
 131. Schunn, C. D., Crowley, K., & Okada, T. (2000). What makes collaborations across a distance succeed?: The case of the Cognitive Science community. Paper presented at the *NSF Workshop on Distributed Work*. Carmel-by-the-Sea, CA (August, 2000).
 132. Schunn, C. D., & Ngo, T. L. (2000). Motivating base-rate sensitivity (sometimes): Testing predictions of the RCCL framework. In the *Proceedings of the 22nd Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 133. Schunn, C. D., & O'Malley, C. J. (2000). Now they see the point: Improving science reasoning through making predictions. In the *Proceedings of the 22nd Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
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134. Trickett, S. B., Fu, W.-T., Schunn, C. D., & Trafton, J. G. (2000). From dippy-doodles to streaming motions: Changes in representation in the analysis of visual scientific data. In the *Proceedings of the 22nd Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 135. Trickett, S. B., Trafton, J. G., & Schunn, C. D. (2000). Blobs, dippy-doodles and other funky things: Framework anomalies in exploratory data analysis. In the *Proceedings of the 22nd Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 136. Schunn, C. D. & Vera, A. H. (1999). Cross-cultural comparisons of the role of the function in property centrality. Poster presented at the *40th Annual Meeting of the Psychonomic Society*. Los Angeles, CA (November, 1999).
 137. Schunn, C. D. (1999). Including authentic experiments in research methods with E-Prime and Statview: An empirical evaluation. Paper presented at the *29th Annual Meeting of the Society for Computers in Psychology*. Los Angeles, CA (November, 1999).
 138. Schunn, C. D., Trickett, S., Trafton, G., & Seeley, G. (1999). Sifting through masses of observational data: children and professional astronomers. Invited symposium talk presented at the *1st Meeting of the Cognitive Development Society*. Chapel Hill, NC (October, 1999).
 139. Schunn, C. D. (1999). Exploring individual variability using ACT-R. Paper presented at the *6th Annual ACT-R Workshop*. Fairfax, VA (August, 1999).
 140. Schunn, C. D. (1999). The presence and absence of category knowledge in LSA. In the *Proceedings of the 21st Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 141. Saner, L., & Schunn, C. D. (1999). Analogies out of the blue: When history seems to retell itself. In the *Proceedings of the 21st Annual Conference of the Cognitive Science Society*. Mahwah, NJ: Erlbaum.
 142. Schunn, C. D., Crowley, K., & Okada, T. (1998). Interdisciplinarity in Cognitive Science: Now and then. Invited symposium talk presented at *The 20th Annual Conference of the Cognitive Science Society*. Madison, WI (August, 1998).
 143. Schunn, C. D., & Anderson, J. R. (1998). The acquisition of expertise in science. Paper presented at the *International Conference on the Application of Psychology to the Quality of Learning and Teaching*. Hong Kong (June, 1998).
 144. Schunn, C. D., & Reder, L. M. (1998). Feeling-of-knowing & strategy selection: Consequences for education. Paper presented at *Annual Meeting of the American Educational Research Association*, San Diego (April, 1998).
 145. Best, B. J., Schunn, C. D., & Reder, L. M. (1998). Modeling adaptivity in a dynamic task. In M. A. Gernsbacher & S. J. Derry (Eds.), *Proceedings of the 20th Annual Conference of the Cognitive Science Society*. (p. 144-149) Mahwah, NJ: Erlbaum.
 146. Schunn, C. D., & Anderson, J. R. (1998). Science education in universities: Explorations of what, when, and how. Paper presented at *Designing for Science*. Pittsburgh, PA (April, 1998).
 147. Schunn, C. D., & Anderson, J. R. (1997). The Simulated Psychology Lab: A Tool for evaluating and teaching research skills. Paper presented at the *1997 Annual Meeting of the Society for Computers in Psychology*, Philadelphia, PA (November, 1997).
 148. Schunn, C. D., & Klahr, D. (1997). GET: A goals/effort tradeoff model of decision making in the design of scientific experiments. Paper presented at the *1997 Annual Meeting of the Judgment/Decision Making Society*, Philadelphia, PA (November, 1997).
 149. Schunn, C. D., & Reder, L. M. (1997). Sensitivity to base-rates: Individual differences in strategy adaptation. Poster presented at the *38th Annual Meeting of the Psychonomic Society*, Philadelphia, PA (November, 1997).
 150. Reder, L. M., Nhouyvanisvong, A., Schunn, C. D., Ayers, M. S., Angstadt, P., & Hiraki, K. (1997). Modeling the Mirror effect in a Continuous Remember/Know Paradigm. In *Proceedings of the 19th Annual Conference of the Cognitive Science Society* (pp. 644-649). Mahwah, NJ: Erlbaum.
 151. Schunn, C. D., & Anderson, J. R. (1997). General and specific expertise in scientific reasoning. In *Proceedings of the 19th Annual Conference of the Cognitive Science Society* (pp. 674-679). Mahwah, NJ: Erlbaum.
 152. Schunn, C. D., & Anderson, J. R. (1997). Psychologist in a box: An ACT-R model that designs and interprets experiments. Paper presented at the *4th Annual ACT-R Workshop*. Pittsburgh, PA (August, 1997).
 153. Schunn, C. D., Crowley, K., & Okada, T. (1996). What leads to a successful collaboration among cognitive scientists? Paper presented at the conference on *Understanding Interdisciplinary Teamwork: Challenges for Research and Practice*. Madison, WI (November, 1996).
 154. Schunn, C. D., & Lovett, M. L. (1996). Representation and individual differences in base-rate neglect. Poster presented at the *37th Annual Meeting of the Psychonomic Society*, Chicago, IL (November, 1996).
 155. Reder, L. M., Nhouyvanisvong, A., Schunn, C. D., Angstadt, P., & Hiraki, K. (1996). Modeling word frequency effects in a continuous remember/know judgment paradigm. Paper presented at the *37th Annual Meeting of the Psychonomic Society*, Chicago, IL (November, 1996).
 156. Schunn, C. D., & Reder, L. M. (1996). Modeling changes in strategy selections over time. Paper presented at the *AAAI-96 Workshop: Computational Cognitive Modeling*, Portland, OR (August, 1996).
 157. Schunn, C. D., & Anderson, J. R. (1996). Modeling Design Processes in Scientific Discovery. Paper presented at the *3rd Annual ACT-R Workshop*. Pittsburgh, PA (August, 1996).
 158. Schunn, C. D., Crowley, K., & Okada, T. (1996). Is cognitive science multidisciplinary?: Past and present perspectives. Poster presented at *The 18th Annual Conference of the Cognitive Science Society*, San Diego, CA (July, 1996).
 159. Schunn, C. D., & Klahr, D. (1996). The problem of problem spaces: When and how to go beyond a 2-space model of scientific discovery. Symposium talk presented at *The 18th Annual Conference of the Cognitive Science Society*, San Diego, CA (July, 1996).
 160. Okada, T., Crowley, K., Schunn, C. D., & Miwa, K. (1996). Collaborative scientific research in Japanese cognitive science: Analyses of questionnaire survey data. Paper presented at the *1996 Meeting of the Japanese Cognitive Science Society*.
 161. Schunn, C. D. & Okada, T. (1996). The role of distributed reasoning and analogy in lab groups and colloquia. Paper presented at the *Nagoya International Symposium on Collaboration*, Nagoya, Japan (May 1996).
 162. Reder, L. M., & Schunn, C. D. (1995). Metacognition does imply awareness: Implicit processes govern strategy selection. Paper presented at the *36th Annual Meeting of the Psychonomic Society*, Los Angeles, CA (November, 1995).
 163. Okada, T., Schunn, C. D., Crowley, K., Oshima, J., Miwa, K., Aoki, T., & Ishida, Y. (1995). Collaborative scientific research: Analyses of historical and interview data. Paper presented at the *1995 Meeting of the Japanese Cognitive Science Society*.
 164. Schunn, C. D. (1995). Creative conceptions in scientific discovery: Creating new data representations. Poster presented at the *Creative Concepts Conference*, Texas A&M University (May, 1995).
 165. Schunn, C. D., Okada, T., & Crowley, K. (1995). Is cognitive science truly interdisciplinary?: The case of interdisciplinary collaborations. In *Proceedings of the 17th Annual Conference of the Cognitive Science Society* (pp. 100-105). Hillsdale, NJ: Erlbaum.
 166. Schunn, C. D., & Klahr, D. (1995). A 4-space model of scientific discovery. Paper presented at the *AAAI 1995 Spring Symposium Series: Conference on Systematic Methods of Scientific Discovery*, Stanford, CA (March, 1995).
 167. Schunn, C. D., & Klahr, D. (1995). A 4-space model of scientific discovery. In *Proceedings of the 17th Annual Conference of the Cognitive Science Society* (pp. 106-111). Hillsdale, NJ: Erlbaum.
 168. Schunn, C. D., & Klahr, D. (1993). Self- vs. other-generated hypothesis in scientific discovery. In *Proceedings of the 15th Annual Conference of the Cognitive Science Society* (pp. 900-905). Hillsdale, NJ: Erlbaum.
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169. Schunn, C. D., & Klahr, D. (1992). Complexity management in a discovery task. In *Proceedings of the 14th Annual Conference of the Cognitive Science Society* (pp. 177-182). Hillsdale, NJ: Erlbaum.
 170. Vera, A. H., & Schunn, C. D. (1992). Causality and the categorization of objects and events. Paper presented at the *18th Annual Meeting of the Society for Philosophy and Psychology*, Montréal, Québec, Canada (June, 1992).
 171. Dunbar, K., & Schunn, C. D. (1990). The temporal nature of scientific discovery: The roles of priming and analogy. In *Proceedings of the 12th Annual Conference of the Cognitive Science Society* (pp. 93-100). Hillsdale, NJ: Erlbaum.