

David Henry Uttal
Curriculum Vitae
(September, 2015)

Address:

Northwestern University
Department of Psychology
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Education:

- 1989 Ph. D. Developmental Psychology, University of Michigan
Thesis: “Children’s Mental Representation of Spatial Information Acquired From Maps”
- 1983 B. S. High Honors in Psychology, College of William and Mary

Academic Awards, Honors and Fellowships:

Postdoctoral

- 2014 George Miller Award for Outstanding Paper in General Psychology (American Psychological Association)
- 2013- President-elect, Cognitive Development Society
- 2010 Charter Fellow, Midwestern Psychological Association
- 2007 Fellow, Association for Psychological Science
- 2004 Fellow, American Psychological Association
- 1996 College of Arts and Sciences Distinguished Teacher Award
Northwestern University
- 1995, 1996 Faculty Honor Roll, Northwestern University
- 1991-1993 National Institute of Health Post-doctoral Fellowship,
University of Illinois at Urbana-Champaign

Predoctoral

- 1989 Rackham Dissertation Fellowship, University of Michigan
- 1987-1988 Rackham Predoctoral Fellowship, University of Michigan
- 1983-1984 National Institute of Health Predoctoral Traineeship, University of Michigan

1983 Stanley B. Williams Prize for Undergraduate Psychology Research,
College of William and Mary

1982 Phi Beta Kappa, College of William and Mary

Employment:

2009-present Professor of Psychology and Education, Northwestern University

1999-2009 Associate Professor of Psychology and Education, Northwestern University

1993-1999 Assistant Professor of Psychology and Education, Northwestern University

1998 Visiting Researcher, Max Planck Institute for Human Development, Berlin

1991-1993 Postdoctoral Fellow, University of Illinois at Urbana-Champaign

1989–1991 Assistant Professor of Psychology, Virginia Tech

Research Support:

2015-2018 (Recommended for Funding). Principle Investigator, “Collaborative Research: Advancing Early STEM Learning Opportunities Through Tinkering and Reflection”, National Science Foundation, \$636,503.

2014-2017 Principal Investigator, “Collaborative Research: Cognitive and Neural Indicators of School-based Improvements in Spatial Problem Solving”, National Science Foundation, \$427, 607.

2015-2019 Co-Principle Investigator, “Enhancing Middle School Mathematics Achievement through Spatial Skills Instruction”, Institute of Education Sciences, \$431, 366.

2012-2016 Co-Principal Investigator, “Teaching Perceptual and Conceptual Processes in Graph Interpretation”, Institute of Education Sciences, \$1,598,108.

2012-2014 Co-Principal Investigator, “Transforming High School Science via Remote Online Labs”, National Science Foundation, \$549, 999.

2011-2014 Principal Investigator, “Collaborative Research: Engineering Children’s Learning”, National Science Foundation, \$114,135.

2009-2011 Co-Principal Investigator, "Developing Guidelines for Using Digital Media Visualization Resources to Support Student Inquiry in Online Laboratory Investigations", National Science Foundation, \$179,203.

2008-2013 Co-Principal Investigator, “Omaha Science Media Project”, Omaha Public Schools Foundation, \$238,000.

2007-2008 Co-Principal Investigator, “Boosting Young Children’s Learning Experiences through Conversations Before, During, and After a Museum Visit”, Spencer Foundation, \$50,000.

2007-2009 Co-Principal Investigator, “Understanding the Tree of Life”, National Science Foundation, \$180,000.

- 2006-2011 Research Scientist. "Spatial Intelligence and Learning Center," National Science Foundation (Science of Learning Center), \$3,600,000.
- 2005-2010 Principal Investigator. "Understanding and Facilitating Symbolic Understanding", U. S. Department of Education (IES), \$962,000.
- 2005-2006 Co-Principal Investigator. "Culture, Regulatory Focus, and Parent Beliefs," Northwestern University Small Grants Program, \$5,000.
- 2002-2005 Principal Investigator. "Learning through Educational Symbols", Institute of Education Sciences, \$545,000.
- 2001-2006 Research Scientist. "Understanding and Fostering Spatial Intelligence", National Science Foundation, \$1,800,000.
- 1998-2002 Principal Investigator. "Scale Relations and the Development of Spatial Cognition", National Institute of Child Health and Development (FIRST Award), \$349,917.
- 1997-1999 Research Scientist. "Spatial Cognition in Intelligent Systems", National Science Foundation, \$881,109.
- 1995-1996 Principal Investigator. "Children's Mental Representation of Maps", National Institute of Mental Health (B/Start Award), \$24,941.
- 1991-1992 Principal Investigator. "Young Children's Understanding and Use of Maps: Effects of Instruction", Spencer Foundation, \$7,491.

Teaching and Training Support:

- 2008-2014 Principal Investigator. "Pre-doctoral Training: Northwestern University Multidisciplinary Program in Education Sciences", U.S. Department of Education (IES), \$4,100,000.
- 2001-2003 Co-Principal Investigator. "Facilitating and Enhancing Undergraduate Research in the Department of Psychology" (With W. Gardner), Provost's Initiative on Undergraduate Research, Northwestern University, \$20,000.
- 1995-1996 Co-Principal Investigator. "Improvements to Introductory Psychology" (With J. M. Bailey), Searle Family Grants for Innovative Teaching, Northwestern University, \$14,000.

Publications:

- Uttal, D. H., Lummis, M., & Stevenson, H. W. (1988). Low and high mathematics achievement in Japanese, Chinese, and American elementary-school children. *Developmental Psychology*, 24, 335-342.
- Chen, C. & Uttal, D. H. (1988). Cultural values, parents' beliefs, and children's achievement in the United States and China. *Human Development*, 31, 351-358.
- Uttal, D. H. (1988). Review of human development and learning. *Contemporary Psychology*, 33, 632.
- Uttal, D. H., & Wellman, H. M. (1989). Young children's representation of spatial information acquired from maps. *Developmental Psychology*, 25, 128-138.

- Uttal, D. H., & Perlmutter, M. (1989). Toward a broader conceptualization of development: The role of gains and losses across the life span. *Developmental Review, 9*, 101-132.
- Stevenson, H. W., Chen, C., & Uttal, D. H. (1990). Beliefs and achievement: A study of black, white, and Hispanic children. *Child Development, 61*, 508-523.
- Uttal, D. H. (1991). Maintaining homeostasis is certainly important, but can it lead to change? Review of coping with uncertainty: Behavioral and developmental perspectives. *Contemporary Psychology, 36*, 1054-1055.
- Uttal, D. H. (1994). Preschoolers' and adults' scale translation and reconstruction of spatial information acquired from maps. *British Journal of Developmental Psychology, 12*, 259-275.
- Ten Have, T. R. & Uttal, D. H. (1994). Subject-specific and population-averaged continuation ratio logit models for multiple discrete time survival profiles. *Applied Statistics, 43*, 371-384.
- Lee, S. Y., Uttal, D. H., & Chen, C. (1995). Writing systems and acquisition of reading in American, Chinese, and Japanese first-graders. In I. Taylor & D. R. Olson (Eds.), *Scripts and literacy: Reading and learning to read alphabets, syllabaries and characters* (pp. 247-263). Boston: Kluwer Academic Publishers.
- Uttal, D. H., Schreiber, J. C., & DeLoache, J. S. (1995). Waiting to use a symbol: The effects of delay on children's use of models. *Child Development, 66*, 1875-1889.
- Uttal, D. H. (1996). Beliefs, motivation, and achievement in mathematics: A cross-national perspective. In M. Carr (Ed.), *Motivation in mathematics* (pp. 25-37). Cresskill, NJ: Hampton Press.
- Uttal, D. H. (1996). Angles and distances: Children's and adults' reconstruction and scaling of spatial configurations. *Child Development, 67*, 2763-2779.
- Uttal, D. H. (1997). Beliefs about genetic influences on mathematics achievement: A cross-cultural comparison. *Genetica, 99*, 165-172.
- Uttal, D. H., Scudder, K. V., & DeLoache, J. S. (1997). Manipulatives as symbols: A new perspective on the use of concrete objects to teach mathematics. *Journal of Applied Developmental Psychology, 18*, 37-54.
- DeLoache, J. S., Uttal, D. H., & Pierroutsakos, S. L. (1998). The development of early symbolization: Educational implications. *Learning and Instruction, 8*, 325-339.
- DeLoache, J. S., Pierroutsakos, S. L., Uttal, D. H., Rosengren, K. S., & Gottlieb, A. (1998). Grasping the nature of pictures. *Psychological Science, 9*, 205-210.
- Uttal, D. H., Marzolf, D. P., Pierroutsakos, S. L., Smith, C. M., Troseth, G. L., Scudder, K. V., & DeLoache, J. S. (1998). Seeing through symbols: The development of children's understanding of symbolic relations. In O. N. Saracho & B. Spodek (Eds.), *Multiple perspectives on play in early childhood education* (pp. 59-79). Albany: State University of New York Press.
- Blades, M., Blaut, J. M., Darvizeh, Z., Elguea, S., Sowden, S., Soni, D., Spencer, C., Stea, D., Surajpaul, R., & Uttal, D. H. (1998). A cross-cultural study of young children's mapping abilities. *Transactions of the Institute of British Geographers, 23*, 269-277.

- Bailenson, J. N., Shum, M. S., & Uttal, D. H. (1998). Road climbing: Principles governing asymmetric route choices on maps. *Journal of Environmental Psychology, 18*, 251-264.
- Uttal, D. H., Liu, L. L., & DeLoache, J. S. (1999). Taking a hard look at concreteness: Do concrete objects help young children to learn symbolic relations? In L. Balter & C. Tamis-LeMonda (Eds.), *Child psychology: A handbook of contemporary issues* (pp.177-192). Philadelphia: Psychology Press/Taylor & Francis.
- Liu, L. L., & Uttal, D. H. (1999). The interaction of symmetry and familiarity in children's reconstruction of spatial configurations. *Spatial Cognition and Computation, 1*, 111-129.
- Bailenson, J. N., Shum, M. S., & Uttal, D. H. (2000). The initial segment strategy: A heuristic for route selection. *Memory and Cognition, 28*, 306-318.
- DeLoache, J. S., Uttal, D. H., & Pierroutsakos, S. L. (2000). What's up? The emergence of an orientation preference for picture books. *Journal of Cognition and Development, 1*, 81-95.
- Uttal, D. H. (2000). Seeing the big picture: Map use and the development of spatial cognition. *Developmental Science, 3*, 247-286.
- Uttal, D. H., & Tan, L. S. (2000) Cognitive mapping in childhood. In R. Kitchin & S. Freundschuh (Eds.), *Cognitive mapping: Past, present, and future* (pp. 147-165). London: Routledge.
- Taylor, H. A., Uttal, D. H., Fisher, J., & Mazepa, M. (2001). Ambiguity in acquiring spatial representation from descriptions compared to depictions: The role of spatial orientation. *Lecture Notes in Computer Science, 2205*, 278-291.
- Uttal, D. H., Gregg, V., Chamberlin, M., & Sines, A. (2001). Connecting the dots: Children's use of a meaningful pattern to facilitate mapping and search. *Developmental Psychology, 37*, 338-350.
- Uttal, D. H. (2001). Making sense of the development of spatial cognition. [Review of the book *Making Space: The development of spatial representation and reasoning*.] *Trends in Cognitive Science, 5*, 316-317.
- Uttal, D. H. (2003). On the relation between play and symbolic thought: The case of mathematics manipulatives. In O. Saracho & B. Spodek (Eds). *Contemporary Perspectives on Play in Early Childhood* (pp. 97-114). Greenwich, CT: Information Age Press.
- Uttal, D. H. (2003). Counterpoint: No, researchers should not be mandated reporters of child abuse. *Monitor on Psychology, 34*, 29.
- Uttal, D. H. & Chiong, C. (2003). Seeing space in more than one way: The development of children's use of higher-order patterns to solve spatial problems. In G. Allen (Ed.), *Human Spatial Memory: Remembering Where* (pp. 125-142). Mahwah, NJ: Erlbaum.
- DeLoache, J. S., Pierroutsakos, S., & Uttal, D. H. (2003). The development of pictorial competence. *Current Directions in Psychological Science, 12*, 114-118.
- DeLoache, J. S., Uttal, D. H., & Rosengren, K. S. (2004). Young children's scale errors offer evidence for two visual systems early in life. *Science, 304*, 1027-1029.

- Uttal, D. H. (2005). Spatial symbols and spatial thought: Cross-cultural, developmental, and historical perspectives on the relation between map use and spatial cognition. In L. Namy (Ed.), *Symbol use and symbolic representation: Developmental and comparative perspectives* (pp. 3-23). Mahwah, NJ: Erlbaum.
- Stieff, M., Bateman, R., & Uttal, D. H. (2005). Teaching and learning with three-dimensional representations. In J. Gilbert (Ed.), *Visualization in science education* (pp. 93-120). Oxford, UK: Oxford University Press.
- Uttal, D. H., Liu, L. L., & DeLoache, J. S. (2005). Concreteness and symbolic development. In L. Balter & C. Tamis-LeMonda, *Child psychology: A handbook of contemporary issues (2nd Ed.)* (pp. 167-184). Philadelphia, PA: Psychology Press.
- Ware, E. A., Uttal, D. H., Wetter, E. K., & DeLoache, J. S. (2006). Young children make scale errors when playing with dolls. *Developmental Science*, 9(1), 40-45.
- Uttal, D. H., Fisher, J. A., & Taylor, H. A. (2006). Words and maps: Children's mental models of spatial information acquired from maps and from descriptions. *Developmental Science*, 9(2), 221-235.
- Uttal, D. H., Sandstrom, L. S., & Newcombe, N. C. (2006). One hidden object, two spatial codes: Young children's use of relational and vector coding. *Journal of Cognition and Development*, 7(4), 503-525.
- Rapp, D., & Uttal, D. H. (2006). Understanding and enhancing visualizations: Two models of collaboration between earth science and cognitive science. In C. Manduca & D. Mogk (Eds.), *Earth and mind: How geologists think and learn about the earth*. Denver: Geological Society of America.
- Newcombe, N. C., & Uttal, D. H. (2006). Whorf versus Socrates, Round 10, *Trends in Cognitive Science*, 10(9), 394-396.
- Davies, C., & Uttal, D. H. (2007). Map use and the development of spatial cognition. In J. Plumert & J. Spencer (Eds.), *The emerging spatial mind* (pp. 219-247). New York: Oxford University Press.
- Bledsoe, C.H., Sherin, B., Galinsky, A.G., Headley, N.M., Heimer, C.A., Kjeldgaard, E., Lindgren, J., Miller, J.D., Roloff, M.E., & Uttal, D.H. (2007). Regulating creativity: Research and survival in the IRB iron cage. *Northwestern University Law Review*, 101(2), 593-642.
- Uttal, D. H., Liu, Linda L., Lewis, A., & Gentner, D. (2008). Developmental changes in children's understanding of the similarity between photographs and their referents. *Developmental Science*, 11(1), 156-170.
- Uttal, D. H., & O'Doherty, K. (2008). Comprehending and learning from visual representations: A developmental approach. In J. Gilbert, M. Reiner, & M. Nakhleh (Eds.), *Visualization: Theory and practice in science education* (pp. 53-72). New York: Springer.
- McNeil, N. M., Uttal, D. H., Jarvin, L., & Sternberg, R. J. (2009). Should You Show Me the Play Money: How Concrete Manipulatives Both Hurt and Help Performance on Math Problems. *Learning and Instruction*, 19(2), 171-184.

- Uttal, D.H., O'Doherty, K.D., & DeLoache, J.S. (2009). Rethinking the concrete-abstract distinction: The case of mathematics manipulatives. *Child Development Perspectives*, 3(3), 156-159.
- Diamond, J., Lynch, J., & Uttal, D. H. (2009). *Practical evaluation guide: Tools for museums and other informal educational settings*. Lanham, MD: Altimira Press.
- Jee, B. D., Gentner, D., Forbus, K., Sageman, B., & Uttal, D. H. (2009). Drawing on Experience: Use of sketching to evaluate knowledge of spatial scientific concepts. In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp 2499-2504). Amsterdam, The Netherlands.
- Ware, E. A., Uttal, D. H., & DeLoache, J. S. (2010). Everyday Scale Errors. *Developmental Science*, 13(1), 28-36.
- Jee, B. D., Uttal, D. H., Gentner, D., Manduca, C., Tikoff, B., & Sageman, B. (2010). Analogical Thinking in Geoscience Education. *Journal of Geoscience Education*, 58(1), 2-13.
- Uttal, D. H., Friedman, A., Warren, C., & Hand, L. L. (2010). (the first two authors contributed equally, and final order of authorship was determined by a flip of a coin). Learning Fine-Grained and Category Information in Navigable Real-World Space. *Memory and Cognition*. 38, 1026-1040
- Matuk, C.F., & Uttal, D.H. (2010). When form contradicts content: The cognitive and communicative functions of cartoons for teaching evolution. In R.E. Griffin (Ed.), *Selected Readings from the Annual Conference of the International Visual Literacy Association* (pp. 161-166). Chicago: International Visual Literacy Association.
- Uttal, L. M. B., & Uttal, D. H. (2010). Children are not little adults: Developmental differences and the juvenile justice system. *Loyola Public Interest Law Report*, 3(Summer, 2010), 234-242.
- Sauter, M. G., & Uttal, D. H., Schaal, A., Levine, S., & Goldin-Meadow, S. (2011). Learning what children know about space from looking at their hands: *The added value of gesture in spatial communication*. *Journal of Experimental Child Psychology*, 111(4), 587-606.
- Jona, K., Roque, R., Skolnik, J., Uttal, D., & Rapp, D. (2011). Are remote labs worth the cost? Insight from a study of student perceptions of remote labs. *International Journal of Online Engineering*, 7(2), 48-53.
- DeLoache, J. S. & Uttal, D. H. (2012). Gulliver, Goliath, and Goldilocks: Young children and scale errors. In V. Slaughter & C. A. Brownwell (Eds.), *Early development of body representations*. (pp. 59-68). Cambridge: Cambridge University Press.
- Matuk, C., & Uttal, D. H. (2012). Narrative spaces in the representation and understanding of evolution. In K. Rosegren, M. Evans, S. Brem, & G. Sinatra (Eds.). *Evolution challenges* (pp. 119-144). New York: Oxford University Press.
- Stachniss, C., Schill, K., & Uttal, D. (Eds.). (2012). Spatial Cognition VIII. *Lecture Notes in Artificial Intelligence*. Freiburg, Germany: Springer
- Uttal, D. H., & Cohen, C. A. (2012). Spatial abilities and STEM education: *When, why, and how*. *Psychology of Learning and Motivation*, 57, 147-182.

- Kolvoord, R., Charles, M., Meadow, N. & Uttal, D. (2012). The Impact of Geospatial Technologies in a Dual-Enrollment Environment. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2012* (pp. 1915-1922). Chesapeake, VA: AACE.
- Newcombe, N. S., Uttal, D. H., & Sauter, M. (2013). Spatial Development. In P. D. Zelazo (Ed.), *Oxford handbook of developmental psychology* (pp. 564-590). New York: Oxford University Press.
- Uttal, D. H., (2013). Introduction to the special issue. *Merrill-Palmer Quarterly*, 59(2), 133-140.
- Sauter, M., Uttal, D. H., Rapp, D. N., Downing, M., & Jona, K. (2013). Getting real: the authenticity of remote labs and simulations for science learning. *Distance Education*, 34(1), 37-47.
- Uttal, D. H., Meadow, N. G., Tipton, E., Hand, L. L., Alden, A. R., Warren, C., & Newcombe, N. S. (2013). The malleability of spatial skills: A meta-analysis of training studies. *Psychological Bulletin*, 139(2), 352-402.
- Jee, B. D., Uttal, D. H., Gentner, D., Manduca, C., & Shipley, T. (2013). Finding faults: Analogical comparison supports spatial concept learning in geoscience. *Cognitive Processing*, 14(2), 175-187.
- Uttal, D. H., Miller, D. I., & Newcombe, N. S. (2013). Spatial thinking: Links to STEM achievement? *Current Directions in Psychological Science*. 22(5), 367-373
- Yuan, L., Lustig, A., Uttal, D., & Franconeri, S. (2013). Low capacity for visual spatial relation memory. *Journal of Vision*, 13(9), 1356-1356
- Sinton, D., Bednarz, S., Gersmehl, P., Kolvoord, R., and Uttal, D.H. (2013). *The People's Guide to Spatial Thinking*. Washington, DC: National Council for Geographic Education.
- Uttal, D. H., & Meadow, N. G. (2013). The Psychology of practice: Lessons from spatial cognition. In D. Reisberg (Ed.). *Oxford Handbook of Cognitive Psychology* (pp. 874-885). Oxford, UK: Oxford University Press.
- Uttal, D. H., Amaya, M., Maita, M., Hand, L. L., Cohen, C. A., O'Doherty, K., & DeLoache, J. S. (2013). It works both ways: Transfer difficulties between manipulatives and written subtraction solutions. *Child Development Research*, 2013, Article ID 216367, 13 pages. <http://www.hindawi.com/journals/cdr/2013/216367/>
- Jee, B. D., Gentner, D., Uttal, D. H., Sageman, B., Forbus, K., Manduca, C. A., & Tikoff, B. (2014). Drawing on Experience: How Domain Knowledge Is Reflected in Sketches of Scientific Structures and Processes. *Research in Science Education*, 1-25. (early version published online, April 11, 2014). 10.1007/s11165-014-9405-2
- Jant, E. A., Haden, C. A., Uttal, D. H., & Babcock, E. (2014). Conversation and Object Manipulation Influence Children's Learning in a Museum. *Child development* (early view, online version published April 29, 2014), 10.1111/cdev.12252
- Uttal, D. H., & Sheehan, K. J. (2014). The Development of Children's Understanding of Maps and Models: A Prospective Cognition Perspective. *Journal of Cognitive Education and Psychology*, 13(2), 188-200. 10.1891/1945-8959.13.2.188

- Baker, T. R., Battersby, S., Bednarz, S. W., Bodzin, A. M., Kolvoord, B., Moore, S., & Uttal, D. (2014). A Research Agenda for Geospatial Technologies and Learning. *Journal of Geography, (ahead-of-print)*, 1-13. 10.1080/00221341.2014.950684
- Jee, B. D., Uttal, D. H., Spiegel, A., & Diamond, J. (2015). Mental models of viruses, vaccines, and the causes of infectious disease. *Public Understanding of Science*, 24, 241-256. 10.1177/0963662513496954
- Uttal, D. H., & Yuan, L. (2014). Using symbols: developmental perspectives. *Wiley Interdisciplinary Reviews: Cognitive Science*, 5(3), 295-304. 10.1002/wcs.1280
- Stieff, M., & Uttal, D. (2015). How Much Can Spatial Training Improve STEM Achievement?. *Educational Psychology Review*, 1-9.
- Mohan, L., Mohan, A., & Uttal, D. (2015). Research on Thinking and Learning with Maps and Geospatial Technologies. IN M. Solem., N. Huynh., & R. Boehm (Eds.), *Learning Progressions for Learning Progressions for Maps, Geospatial Technology, and Spatial Thinking: A Research Handbook*. New York: Cambridge University Press.
- Condon, D. M., Wilt, J., Cohen, C. A., Revelle, W., Hegarty, M., & Uttal, D. H. (2015). Sense of direction: General factor saturation and associations with the Big-Five traits. *Personality and Individual Differences*, 86, 38-43.

Articles in press or under review

- Haden, C. A., Cohen, T., Uttal, D., & Marcus, M. (in press). Building learning: Narrating experiences in a children's museum. In D. Sobel & J. Jipson (Eds.), *Relating Research and Practice: Cognitive Development in Museum Settings*. New York, NY: Psychology Press.
- Sheehan, K., Uttal, D. H., & Gentner. (under review). Young Children Rely on Overall Similarity to Understand a Novel Symbol. *Journal of Experimental Child Psychology*.
- Marcus, M., Haden, C. A., & Uttal, D. H. (under review). STEM learning and transfer in a children's museum and beyond its walls. *Merrill-Palmer Quarterly*.

Presentations (since 2010 only)

- Uttal, D. H. (2015, July). Spatial cognition and spatial technologies: A two-way street. Presented at IBRO 2015 satellite conference and the Brazilian Academy of Science, Rio de Janeiro, Brazil.
- Ramey, K .E., & Uttal, D. H. (2015, April). Creating Space for Engineering Learning: Spatial Thinking and Learning in a Middle School Engineering Camp. Presented at AERA 2015, Chicago, IL.
- Uttal, D. H. (2015, February). Promoting Spatially Based Scientific Reasoning with Geographic Information Systems. Presented at 2015 AAAS Annual Meeting, San Jose, CA.
- Uttal, D. H., & Sheehan, K. J. (2014, May). The development of children's understanding of maps and models: A prospective cognition perspective. Presented at the annual meetings of the Midwestern Psychological Association, Chicago.

- Marcus, M., Jones, L., Auchstetter, A. S., Haden, C. A., & Uttal, D. H. (2014, May). Parent-Child Conversations and Children's Transfer of STEM Knowledge. Presented at the annual meetings of the Midwestern Psychological Association, Chicago.
- Ramey, K. E., & Uttal, D. H. (2014, April). Drawing connections and building bridges: Spatial thinking, sketching, and modeling in middle school engineering activities. Presented at the annual meetings of the American Education Research Association, Philadelphia.
- Uttal, D. H. (2013, October). Learning from concrete symbolic objects. Paper presented at the biennial meetings of the Cognitive Development Society, Memphis, TN.
- Uttal, D. H. (2013, October) The role of pedagogy in learning from exploration. Discussant in symposium presented at the annual meetings of the Cognitive Development Society, Memphis, TN.
- Marcus, M., Hoffman, P., Haden, C. A., & Uttal, D. (2013, April). Parent-child conversations during hands-on activities in a museum: Fostering STEM learning and transfer. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle.
- Jant, E. W., Meadow, N., Uttal, D. H., Hund, A., & Kolvoord, R. (2013, April). Using GIS in project based curriculum: Influence on students' approach to problem solving. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle.
- Haden, C., Uttal, D., Marcus, M., Hoffman, P., Senior, A., & Wilkerson, E. (2013, April). Parent-child conversation and hands-on activity: Impacts on children's STEM learning and transfer. Paper presented at the biennial meeting of the Society for Research in Child Development, Seattle. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle.
- Sheehan, K., & Uttal, D. H. (2013, April). More is more: Extraneous similarity enhances 3-year-olds' performance in a model-room task.
- Jee, B. D., Uttal, D. H., Diamond, J., & Spiegel, A. (2013, April). Students' and teachers' beliefs about the microbiological structure and activity of viruses and vaccines. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle.
- Yuan, L., Uttal, D., & Gentner, D. (2013, April). The effect of analogy and relational language on young children's map-reading. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle.
- Uttal, D. H. (2013, August). Analogy and spatial problem-solving. Paper presented at the Analogy Conference, University of Burgundy, Dijon, France.
- Uttal, D. H., & Jee, B. D., & Gentner, D. (2012, November). Analogical comparison facilitates learning to recognize faults. Paper presented at the Annual Meeting of the Geological Society of America. Charlotte, NC.
- Yuan, L., Uttal, D. H., & Gentner, D. (2012, May). Analogy facilitates children's map learning. Presented at the annual meetings of the Midwestern Psychological Association, Chicago.
- Jee, B., Diamond, J., Uttal, D. H., & Spiegel, A. (2012, May). Mental Models of Viruses, Vaccines, and the Causes of Infectious Disease. Presented at the annual meetings of the Association for Psychological Science, Chicago.

- Sauter, M., Downing, M., Jona, K., Uttal, D.H., & Rapp, D.N. (2012, April). How to get real: The Authenticity of computer-based labs. Poster presented at AERA annual meeting, Vancouver.
- Wilkerson, E., Haden, C., Uttal, D., Hoffman, P., & Meadow, N. (2011, October). Parent-child conversations and object manipulation in a museum exhibit: Impacts on learning outcomes. Presented at the biennial meetings of the Cognitive Development Society, Philadelphia.
- Kolvoord, R. A., Uttal, D. H., Meadow, N. G., & Lineweaver, L. (2011, September). Using Video Case Studies to Assess the Impact of the Use of GIS on Secondary Students' Spatial Thinking Skills. Presented at the International Conference on Spatial Thinking and Geographic Information Science. Tokyo.
- Yuan, L., Sauter, M., & Uttal, D. (2011, July). Can comparison facilitate preschooler's understanding of maps? Poster presented at CogSci2011, Boston.
- Downing, M., Sauter, M., Uttal, D., Rapp, D.N., & Jona, K. (2011, May). Simulated and remote online labs: A comparison of novel methods in scientific learning. Presented at the annual meeting of the Midwestern Psychological Association, Chicago.
- Sauter, M., Reynolds, E., & Uttal, D. (2011, April). "Drawing" conclusions about spatial development. Presented at the Society for Research in Child Development Conference, Montreal.
- Jee, B. D., Uttal, D. H., Gentner, D. (2011, April). The Role of Alignment in Learning Geoscience Structures. Presented at the Annual Meeting of the American Education Research Association, New Orleans.
- Sauter, M., Rapp, D., Uttal, D., Jona, K., Skolnik, J., & Roque, R. (2011, April). Grounding students' understandings of 'doing science' in actual lab experiences. Presented at the Annual Meeting of the American Education Research Association, New Orleans.
- Uttal, D. H., & Ware, E. A. (2011, April). Scale errors in the real world. Presented at the biennial meetings of the Society for Research in Child Development Conference, Montreal.
- Uttal, D. H. (2011, April). Discussant in Symposium, "The Computer-Based Clinical Interview in Mathematics Assessment From K to 3: Reliability, Validity, Profiles and Group Differences." Presented at the biennial meetings of the Society for Research in Child Development Conference, Montreal.
- Skolnik, J., Roque, R., Sauter, M., Jona, K., Uttal, D., & Rapp, D.N. (2010, August). Student discourse about scientific inquiry as a function of simulated and remote learning experiences. Poster presented at the 20th annual meeting of the Society for Text and Discourse, Chicago.
- Jee, B., Uttal, D., Crouch, C., Spiegel, A., & Diamond, J. (2010, August). Mental models of viruses. Poster presented at the annual meetings of the Cognitive Science Society, Portland, OR.
- Uttal, D. H. (2010, July). Invited participating, Symposium, Geography Education: A Cinderella Story in the Making? Presented at the biennial meetings of the International Conference of the Learning Sciences, Chicago.

- Matuk, C., & Uttal, D. (2010, June). Inventing a representation of relatedness. Paper presented at the International Conference of the Learning Sciences, Chicago.
- Sauter, M., Uttal, D., & Gentner, D. (2010, May). Maps in a snap: Can comparison facilitate preschoolers' understanding of maps? Poster presented at the 3rd annual Inter-Science of Learning Conference, Boston.
- Matuk, C., & Uttal, D. (2010, May). The rhetorical functions of visual devices: Understanding evolution from museum animations. Paper presented at the annual meeting of the American Education Research Association, Denver.
- Chin, I., Wilkerson, E., Hoffman, P., Haden, C., & Uttal, D. (2010, April). Museum Memories: Linkages to Exhibit Experiences. Presented at the annual meeting of the Midwestern Psychological Association, Chicago.
- Jee, B., Uttal, D., Crouch, C., Spiegel, A., & Diamond, J. (2010, April). Understanding the microbiological world: People's beliefs and reasoning about viruses. Presented at the annual meeting of the Midwestern Psychological Association, Chicago.
- Ptouchkina, M., O'Brien, C., & Uttal, D. H., (2010, April). Spatial ability and the use of mapping software: A two-way street. Presented at the annual meeting of the Midwestern Psychological Association, Chicago.

Invited Addresses and Colloquia (since 2005 only)

- 2015 Invited Presentation, Brazilian Academy of Science, Rio de Janeiro, Brazil.
- 2015 Invited Colloquium, Center for Talented Youth, Johns Hopkins University, Baltimore, MD.
- 2014 Colloquium, Wisconsin Ideas in the Science of Education (WISE) Series, University of Wisconsin, Madison, WI.
- 2014 Invited Speaker, Spatial Cognition Conference, University of Latvia, Riga
- 2014 Invited Speaker, University of Chicago Interdisciplinary Predoctoral Training Program in Education Sciences.
- 2013 Invited Plenary Speaker, Gordon Conference on Scientific University, Bryant University, Smithfield, RI.
- 2012 Invited Speaker, OECD conference on the Science of Learning, Paris
- 2011 Colloquium, University of California, Santa Barbara
- 2011 Colloquium, Carnegie-Mellon University
- 2010 Colloquium, Illinois State University
- 2010 Colloquium, Georgia State University
- 2008 Invited Participant, National Geographic Society Conference on Spatial Learning, Washington, DC
- 2008 Invited Speaker, Spatial Learning Conference, Evanston, IL
- 2007 Invited Speaker, Developmental Brownbag, University of Chicago
- 2007 Visiting Scholar, Learning Sciences Program, Vanderbilt University

- 2007 Invited Speaker, Spatial Learning Conference, Michigan Technological University
- 2006 Invited Symposium, Midwestern Psychological Association, Chicago
- 2006 Keynote Speaker, Annual Royce Memorial Conference, Department of Psychology, University of Alberta
- 2005 Invited Colloquium, Cognitive Science Program, Ohio State University
- 2005 Invited Colloquium, Department of Psychology, Virginia Tech

Administration and Service

President-elect: Cognitive Development Society (2015-2017).

Director of Graduate Studies, Northwestern University, Department of Psychology (2014-present).

Cognitive Division Head: Northwestern Department of Psychology (2012-2014).

Director: Northwestern Multidisciplinary Program in Educational Sciences (2007-2014).

Director of Undergraduate Studies: Northwestern University Department of Psychology (1996-2005)

Director, Honors Program: Northwestern University Department of Psychology (1996-2002; 2007-2011)

Master, Shepard Residential College: Northwestern University (2003-2006; 2012-2015)

Associate Editor: Psychological Bulletin (2014-present).

Associate Editor: Merrill-Palmer Quarterly (2007-2013)

Editorial Board: Developmental Psychology (2005-2009), *Journal of Spatial Cognition and Computation* (2005-Present). *Merrill-Palmer Quarterly* (2005-2007)

Grant Panel Memberships: Standing Panel for Mathematics and Science Education, Institute of Educational Sciences, Institute of Education Sciences, (2006-Present); Standing Panel for Basic Processes, Institute of Education Sciences (2014-Present).

Ad-hoc Reviewer: Applied Cognitive Psychology, British Journal of Developmental Psychology, Child Development, Cognitive Psychology, Contemporary Psychology, Developmental Science, Journal of Applied Psychology, Journal of Developmental Processes, Journal of Educational Psychology, Journal of Experimental Child Psychology, Journal of Memory and Language, Memory and Cognition, National Science Foundation

Governing Council: Midwestern Psychological Association (2008-2010), Cognitive Development Society (2009-2011).

Treasurer: American Psychological Association, Division 7, (2004-2006)

Program Chair: Spatial Cognition (2012); Midwestern Psychological Association (2006), American Psychological Association, Division 7 (2001)

Program Committee: American Education Research Association (2005, 2009), Cognitive Development Society (2002, 2004, 2006, 2008), Cognitive Science Society (2004-2005), Midwestern Psychological Association (2002-2006). Jean Piaget Society (2003-2006, 2008,

2010), Society for Research on Child Development (1999, 2007, 2009); Spatial Cognition Conference (2012).

Professional Society Memberships: American Educational Research Association, American Psychological Association, American Psychological Society, Cognitive Developmental Society, Cognitive Science Society, Jean Piaget Society, Midwestern Psychological Association, Society for Research in Child Development, Association for Psychological Science