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EDUCATION

Ph. D., Cognitive Psychology,	University of Pittsburgh	2004
M.S., Cognitive Psychology,	University of Pittsburgh	1999
B.S., Physics,	The Pennsylvania State University	1991

RESEARCH INTERESTS

Math and Science Learning; Knowledge Transfer; Individual Differences in Learning; Tutoring; Metacognition and Motivation; Supporting Learning of At-Risk Students; Application of Cognitive Theory to Instructional Design; Educational Technology.

RESEARCH EXPERIENCE

Research Psychologist and Co-PI, Carnegie Mellon University Promoting CVS Transfer via Framing and Abstraction	2010-present
Research Psychologist, Carnegie Mellon University Training in Experimental Design (TED) Tutor Project	2006-2010
Postdoctoral Researcher, Carnegie Mellon University Lesson Planning Project	2004-2006
Graduate Research Assistant, University of Pittsburgh WHY (Natural Language Physics Tutor) Project	2002
Research Technician, Omni Corporation	Summer 2000
Graduate Research Assistant, University of Pittsburgh Andes Physics Tutor Project	1997-2001
Graduate Research Assistant, University of Pittsburgh Human Tutoring in Physics Project	1996-1997
Graduate Research Assistant, University of Pittsburgh Human Tutoring in Biology Project	1994-1996

PUBLICATIONS

Siler, S. A. & Klahr, D. (Manuscript in Preparation). The effect of surface-feature concreteness on sixth- and seventh-grade students' learning and transfer of experimental design skills.

Siler, S. A. & Klahr, D. (Under Review). Promoting the Learning and Transfer of Basic Experimental Design Skills: Individual Differences in the Effect of Instructional Framing. Submitted to *Journal of the Learning Sciences*.

Siler, S. A. & Willows, K. J. (2014). Age and ability-related differences in the effect of figure concreteness on learning and transfer of a mathematical concept. *Learning and Instruction*, 33, 170-181. DOI: 10.1016/j.learninstruc.2014.05.001

Siler, S. A. & VanLehn, K. (2014). Investigating Microadaptation in One-to-One Human Tutoring. *The Journal of Experimental Education*. DOI: 10.1080/00220973.2014.907224

- Siler, S. A., Klahr, D., & Matlen, B. (2013). Conceptual change when learning experimental design. In Vosniadou, S. (Editor) *2nd Edition of the International Handbook of Research on Conceptual Change*, Routledge.
- Siler, S. A., & Klahr, D. (2012). Detecting, Classifying and Remediating Children's Explicit and Implicit Misconceptions about Experimental Design. In Proctor, R. W., & Capaldi, E. J. (Eds.), *Psychology of Science: Implicit and Explicit Reasoning*. New York: Oxford University Press.
- Siler, S. A., Klahr, D., & Price, N. (2012). Investigating the mechanisms of learning from a constrained preparation for future learning activity. *Instructional Science*, 41(1), 191-216. DOI: 10.1007/s11251-012-9224-7.
- Siler, S. A., Klahr, D., Magaro, C., Willows, K., & Mowery, D. (2010). Predictors of transfer of experimental design skills in elementary and middle school children. *Proceedings of the 10th ITS 2010 Conference. Lecture Notes in Computer Science*, 6095, 198-208.
- Siler, S. A., Mowery, D., Magaro, C., Willows, K., & Klahr, D. (2010). Comparison of a computer-based to a hands-on lesson in experimental design. *Proceedings of the 10th ITS 2010 Conference. Lecture Notes in Computer Science*, 6095, 408-410.
- Siler, S. A & VanLehn, K. (2009). Learning, Interactional, and Motivational Outcomes in One-to-One Synchronous Computer-mediated versus Face-to-face Tutoring. *International Journal of Artificial Intelligence in Education*, 19, 73-102.
- Klahr, D., Triona, L., Strand-Cary, M., & Siler, S. (2008) Virtual versus physical materials in early science instruction: Transitioning to an autonomous tutor for experimental design. In J. Zumbach, N. Schwartz, T. Seufert and L. Kester (Eds), *Beyond knowledge: The legacy of competence meaningful computer-based learning environments* (pp.163-172). Springer Science and Business Media.
- Li, J., Klahr, D., & Siler, S. A. (2006). What Lies Beneath Standards Alignment and Science Achievement Gap? A Blueprint for Managing Content Standards, Accountability Tests, and Everyday Instruction. *Science Educator*, 15-1.
- Chi, M. T. H., Siler, S. A., & Jeong, H. (2004). Can tutors monitor their students' understanding accurately? *Cognition and Instruction*, 22(3), 363-387.
- Siler, S. A. & VanLehn, K. (2003). Accuracy of Tutors' Assessments of their Students by Tutoring Context. In R. Alterman & D. Hirsch, (Eds.), *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, Hillsdale, NJ: Erlbaum.
- Rosé, C., Bhembé, D., Siler, S., Srivastava, R., & VanLehn, K. (2003). Exploring the Effectiveness of Knowledge Construction Dialogues, *Proceedings of Artificial Intelligence in Education 2003*, Sidney, Australia.
- Rosé, C., Bhembé, D., Siler, S., Srivastava, R., & VanLehn, K. (2003). The Role of Why Questions in Effective Human Tutoring, *Proceedings of Artificial Intelligence in Education 2003*, Sidney, Australia.
- VanLehn, K., Siler, S. A., Murray, C., Yamauchi, T., & Baggett, W. B. (2003) Why do only some events cause learning during human tutoring? *Cognition and Instruction*, 21(3), 209-249.
- Siler, S. A., Rosé, C., Frost, T., VanLehn, K., & Koehler (2002). Evaluating knowledge construction dialogs (KCDs) versus minilessons within Andes2 and alone, *ITS2002 Workshop on Empirical Methods for Tutorial Dialogue Systems* (pp. 9-15), San Sebastian, Spain.
- VanLehn, K., Jordan, P., Rosé, C. P., Bhembé, D., Bottner, M., Gaydos, A., Makatchev, M., Pappuswamy, U., Ringenberg, M., Roque, A., Siler, S., & Srivastava, R. (2002). The architecture of WHY2-Atlas: A coach for qualitative physics essay writing. In S. A. Cerri, G. Gouarderes, & F. Paraguacu (Eds.), *Intelligent Tutoring Systems, 2002, 6th International Conference* (pp. 158 – 167).

- Rosé, C. P., Bhembé, D., Roque, A., Siler, S. A., Srivastava, R., & VanLehn, K. (2002). A Hybrid Language Understanding Approach for Robust Selection of Tutoring Goals. In S. A. Cerri, G. Gouarderes, & F. Paraguacu (Eds.), *Intelligent Tutoring Systems, 2002, 6th International Conference* (pp. 552 – 561).
- Jordan, P. & Siler, S. A. (2002). Student Initiative and Questioning Strategies in Computer-Mediated Human Tutoring Dialogs, *ITS2002 Workshop on Empirical Methods for Tutorial Dialogue Systems*, San Sebastian, Spain. [Siler presented talk]
- Rosé, C. P., Jordan, P., Ringenberg, M., Siler, S. A., VanLehn, K., & Weinstein, A., (2001), Interactive conceptual tutoring in Atlas-Andes, In J. D. Moore, C. L. Redfield & W. L. Johnson (Eds.). *AI in Education: AI-ED in the Wired and Wireless Future* (pp. 256-266). Amsterdam: IOS Press. Winner of the 2001 Second Best Paper Award.
- Chi, M. T. H., Siler, S. A., Jeong, H., Yamauchi, T., & Hausmann, R. G. (2001) Learning from human tutoring. *Cognitive Science*, 25, 471-533.
- Rosé, C., Freedman, R., Jordan, P., Ringenberg, M., Roque, A., Schulze, K., Shelby, R., Siler, S. A., Treacy, D., VanLehn, K., Weinstein, A., & Wintersgill, M. (2000). Conceptual Tutoring in Atlas-Andes. In Building Dialogue Systems for Tutorial Applications: Papers from the 2000 Fall Symposium (North Falmouth, MA), demo session. AAAI Technical Report FS-00-01.
- VanLehn, K., Siler, S. A., Murray, C., & Baggett, W.B. (1998). What makes a tutorial event effective? In M. A. Gernsbacher & S. J. Derry (Eds.), *Proceedings of the 20th Annual Conference of the Cognitive Science Society* (pp 1084-1089). Hillsdale, NJ: Erlbaum.
- VanLehn, K., Niu, Z., Siler, S. A., & Gertner, A. (1998). Student modeling from conventional test data: A Bayesian approach without priors. In *Proceedings of the 4th ITS '98 Conference* (pp. 434-443). Springer-Verlag Berlin Heidelberg.
- Jeong, H., Siler, S. A., & Chi, M. T. H. (1997). Can tutors diagnose students' understanding? In M. G. Shafto & P. Langley (Eds.), *Proceedings of the Nineteenth Annual Conference of the Cognitive Science Society* (p. 959). Mahwah, NJ: Erlbaum.

CONFERENCE PRESENTATIONS

- Siler, S. A. & Klahr, D. (June, 2014). Do students learn domain-general skills better with domain-general examples? In F. Fischer (Chair), *The interplay of domain-specific and domain-general factors in scientific reasoning and argumentation*. Symposium conducted at the International Conference of the Learning Sciences (ICLS), Boulder, Colorado.
- Siler, S. A., Klahr, D., Willows, K., & Magaro, C. (2013). *The effect of example concreteness on sixth- and seventh-grade students' learning of experimental design*. Paper presented at the 2013 European Association for Research on Learning and Instruction (EARLI) conference. Munich, Germany.
- Siler, S. A. & VanLehn, K. (2013). *The effect of shared experience on learning outcomes in one-to-one human tutoring*. Paper presented at the 2013 European Association for Research on Learning and Instruction (EARLI) conference. Munich, Germany.
- Navaroli, D., Siler, S. A., Magaro, C. (2013). *Comparison of teacher-generated to coupled teacher/student-generated analogy in cell biology*. Paper presented at the 2013 National Science Teachers' Association conference, Portland, Oregon.
- Siler, S. A. Klahr, D., Willows, K., & Magaro, C. (2013). *The effect of instructional framing on learning and transfer of experimental design skills*. Poster presented at the Annual Meeting of the American Educational Research Association, 2013, San Francisco, California.

- Siler, S. A., Klahr, D., Willows, K., & Magaro, C. (2013, March). *The effects of figure abstraction and feature relevance on sixth- through eighth-grade students' learning and transfer to a math domain*. Paper presented at the Spring 2013 conference for the Society for Research on Educational Effectiveness (SREE). Washington, D.C.
- Siler, S. A., Klahr, D., Magaro, C., & Willows, K. (2012, December). *The effect of instructional framing on learning and transfer of experimental design skills*. Paper presented at the 2012 National Science Teachers Association (NSTA) Conference. Phoenix, AZ.
- Siler, S. A., Klahr, D., Magaro, C., & Willows, K. (2012, September). *Investigation of causes of goal misinterpretations during a lesson on experimental design*. Paper presented at the 8th International Conference on Conceptual Change. Trier, Germany.
- Siler, S. A., Klahr, D., Magaro, C., & Willows, K. (2012, March). *The effect of instructional framing on learning and transfer of experimental design skills*. Paper presented at the 2012 National Association for Research in Science Teaching (NARST) Annual International Conference. Indianapolis, IN.
- Siler, S. A., Klahr, D., Willows, K., & Magaro, C. (2011). *The effect of scaffolded causal identification in the transfer of experimental design skills*. Paper presented at the Fall 2011 conference for the Society for Research on Educational Effectiveness (SREE). Washington, D.C.
- Siler, S. A., Klahr, D., Willows, K., & Magaro, C. (2011). *The effect of prompted causal identification in the transfer of experimental design skills*. Poster presented at the 33rd Annual Conference of the Cognitive Science Society. Boston, MA.
- Siler, S. A., Klahr, D., Magaro, C., & Willows, K. (2011). *Training in Experimental Design (TED): Integrating Lab and Classroom Research into the Design of Computerized Instruction for Elementary and Middle School Students*. Talk given at the 2011 National Association of Laboratory & University Affiliated Schools (NALS) Annual Conference. Pittsburgh, PA.
- Siler, S. A., Klahr, D., Magaro, C., & Willows, K. (2010). *Biases that Interfere with Children's Learning of Experimental Design*. Talk given at the American Psychological Society (APS) Conference 2010, Boston, MA.
- Siler, S. A., Strand-Cary, M. S., Magaro, C., Willows, K., & Klahr, D. (2010). *Training in Experimental Design (TED): Developing Scalable and Adaptive Computer-based Science Instruction (Year 4)*. Poster presented at 2010 IES Research Conference, Washington, D.C.
- Siler, S. A., Klahr, D., Strand-Cary, M. S., Magaro, C., & Willows, K. (2009). *Adapting an effective lesson plan for a computer-based tutor*. Talk given at the 13th Biennial Conference for the European Association for Research on Learning and Instruction (EARLI), Amsterdam, Netherlands.
- Siler, S. A., Strand-Cary, M. S., Magaro, C., Willows, K., & Klahr, D. (2009). *Training in Experimental Design (TED): Developing Scalable and Adaptive Computer-based Science Instruction (Year 3)*. Poster presented at 2009 IES Research Conference, Washington, D.C.
- Siler, S. A., Strand-Cary, M. S., Magaro, C., Willows, K., & Klahr, D. (2009). *Alternative beliefs about experimental design*. Paper presented at the Annual Meeting of the American Educational Research Association, 2009, San Diego, California.
- Siler, S. A., Strand-Cary, M. S., Magaro, C., Willows, K., & Klahr, D. (2008). *Training in Experimental Design (TED): Developing Scalable and Adaptive Computer-based Science Instruction (Year 2)*. Poster presented at 2008 IES Research Conference, Washington, D.C.
- Klahr, D., Triona, L., Strand-Cary, M., & Siler, S. A. (2008). *Virtual vs. Physical Materials in Early Science Instruction: Transitioning to an Autonomous Tutor for Experimental Design*. Talk given at the European Association for Research on Learning and Instruction Conference, Salzburg, Austria.

- Strand-Cary, M. S., Siler, S. A., Magaro, C., & Klahr, D. (2007). *Training in experimental design (TED): Developing scalable and adaptive computer-based science instruction*. Poster presented at 2007 IES Research Conference, Washington, D.C.
- Klahr, D., Li, J., Strand-Cary, M., Siler, S., & Triona, L. (2007). *The importance of defining before maligning*. Talk given at the 2007 American Association for the Advancement of Science (AAAS) Conference, San Francisco, California.
- Siler, S. A. & Li, J. (2006). *African-American late-elementary-school students: Can their motivational patterns be explained by Dweck and Leggett's model of motivation?* Poster presented at the Annual Meeting of the American Educational Research Association, 2005, San Francisco, California.
- Siler, S. A. & Li, J. (2006). *Stereotype threat: Does it hurt the science achievement test performance of African-American and female 6th-graders?* Poster session presented at the Annual Meeting of the American Educational Research Association, 2005, San Francisco, California.
- Klahr, D., Strand-Cary, M., Li, J., & Siler, S. A. (2005) *Traversing the interface between basic research and the classroom in elementary science instruction*. Talk given at the Cognitive Development Society Conference, San Diego, California.
- Siler, S. A. & Chi, M. (2000). *Collaboration during error remediation*. Talk given at the annual University of Pittsburgh/Carnegie Mellon University Psychology Graduate Student conference.
- Chi, M. T. H., Siler, S. A., Ferrari, M., & Slotta, J. D. (1999). *Why Students Fail to Learn Concepts of Complexity*. Paper presented at the Annual Meeting of the American Educational Research Association, 1999, Montreal, Canada.
- Siler, S. A. & Chi, M. T. H. (1998). *Revising knowledge representation in one-to-one tutoring*. Poster presented at the Annual Meeting of the American Educational Research Association, 1998, San Diego, California.
- Siler, S. A. (1998). Knowledge integration when learning "Complex" processes. Talk given at the annual University of Pittsburgh/Carnegie Mellon University Psychology Graduate Student conference.

GRANTS

Co-Principal Investigator with David Klahr on Institute of Education Sciences (IES) Award R305A100404 Promoting Transfer of the Control of Variables Strategy in Elementary and Middle School Children via Contextual Framing and Abstraction, 2010, \$1.5 million.

IES Award R305H060034 Training in Experimental Design: Developing Scalable and Adaptive Computer-based Science Instruction, 2006, \$1.5 million.

TEACHING EXPERIENCE AND MENTORSHIPS

Mentor for Pittsburgh Science of Learning Center (PSLC) Summer Interns	2013; 2014
Mentor for PSLC Teacher-Researcher Fellow	2009-2014
Adjunct Professor, University of Pittsburgh Course: Intro to Planning and Assessment in the Elementary Classroom	2008
Tutor, TED Tutor project, various local elementary and middle schools Topic: Science Inquiry Skills	2006-2010
Teaching Assistant, University of Pittsburgh Course: Research Methods Laboratory	2000; 2003-4
Teaching Assistant, University of Pittsburgh Course: Cognitive Psychology Laboratory	1999; 2002

RESEARCH-RELATED SKILLS

Extensive experience with: SPSS, MS Office, PowerPoint, CTAT (Cognitive Tutor Authoring Tools); developing surveys, instruction, and assessments; developing and conducting quasi-experimental and randomized controlled design studies; conducting think-aloud protocols; qualitative (protocol) and quantitative data analyses.

PROFESSIONAL ACTIVITIES

Reviewer for: Acta Psychologica; Child Development Perspectives; Cognitive Development; Educational Psychology; International Journal of Artificial Intelligence in Education; Learning and Instruction; Mind, Brain, and Education; Revista Colombiana de Psicología; Society for Research in Educational Effectiveness Conference.

Organizer of symposiums:

- Interactive instruction: Why it is effective and how it may be improved, presented at the 2013 European Association for Research on Learning and Instruction (EARLI) conference.
- Supporting Elementary and Middle-School Students' Development of Science Reasoning Skills, at the 2011 Fall conference of the Society for Research on Educational Effectiveness (SREE).

Presented work related to the TED projects to teacher audiences at professional development workshops, teacher conferences, and at our collaborating schools.