

CURRICULUM VITAE

Luis A. Saldanha, 2009

Education

Ph.D.	2004	Mathematics Education, Vanderbilt University
M.T.M.	1995	Mathematics Education, Concordia University (Canada)
B.S.	1993	Mathematics, Concordia University (Canada)

Dissertation

“Is this sample unusual?”: Students exploring connections between sampling distributions and statistical inference. Advisor: Patrick Thompson

Master’s Thesis

Linear independence/dependence: A conceptual analysis and students’ difficulties.
Advisor: Anna Sierpinska

Academic Positions

Assistant Professor, Mathematics and Statistics, Arizona State University, Aug. 2008-present

Assistant Professor, Mathematics and Statistics, Portland State University, Jan. 2005-Aug. 2008

Post-doctoral Research Fellow, University of Québec at Montreal, Nov. 2003-Dec. 2004

Refereed Publications

Book Chapters

Kieran, C., & Saldanha, L. (2008). Designing tasks for the co-development of conceptual and technical knowledge in CAS activity: An example from factoring. In K. Heid & G. W. Blume (Eds.), *Research on technology and the teaching and learning of mathematics: Syntheses, cases, and perspectives* (Vol. 2, pp. 393-414). Greenwich, CT: Information Age Publishing.

Thompson, P. W., Liu, Y., & Saldanha, L. A. (2007). Intricacies of statistical inference and teachers' understandings of them. In M. Lovett & P. Shaw (Eds.), *Thinking with data* (pp. 207-231). Mahwah, NJ: Erlbaum.

Thompson, P.W. & Saldanha, L. A. (2003). Fractions and multiplicative reasoning. In J. Kilpatrick, W. G. Martin, & D. Schifter (Eds.), *A Research Companion to Principles and Standards for School Mathematics* (pp. 95-113). Reston, VA: National Council of Teachers of Mathematics.

Sierpinska, A., Defence, A., Khatcherian, T., Saldanha, L. (1997). A Propos de Trois Modes de Raisonnement en Algèbre Linéaire. In J. L. Dorier (Ed.), *L'enseignement de l'algèbre linéaire en question* (pp. 249-267). Grenoble: Éditions La Pensée Sauvage.

Journal Articles

Simon, M., Saldanha, L., McClintock, E., Karagoz Akar, G., Watanabe, T. & Zembat, I. (in press). A Developing Approach to Studying Mathematical Conceptual Learning: A Focus on Students' Learning through Their Mathematical Activity. *Cognition and Instruction*.

Saldanha, L. & Thompson, P. (2007). Exploring Connections between Sampling Distributions and Statistical Inference: an Analysis of Students' Engagement and Thinking in the Context of Instruction Involving Repeated Sampling, *International Electronic Journal of Mathematics Education*, 2(3). <http://www.iejme.com>

Kieran, C., & Drijvers, P., with Boileau, A., Hitt, F., Tanguay, D., Saldanha, L., & Guzmán, J. (2007). The co-emergence of machine techniques, paper-and-pencil techniques, and theoretical reflection: A study of CAS use in secondary school algebra. *International Journal of Computers for Mathematical Learning*, 11, 205-263. On-line version available for Springer subscribers.

Kieran, C., Boileau, A., Saldanha, L., Hitt, F., Tanguay, D., & Guzmán, J. (2006). Le rôle des calculatrices symboliques dans l'émergence de la pensée algébrique : le cas des expressions équivalentes. *Actes du colloque EMF2006* (Espace Mathématique Francophone, mai 2006). Sherbrooke, QC. Retrieved on October 6, 2006 from <http://ermeweb.free.fr/definitif/>

Saldanha, L. A. & Thompson, P. W. (2002). Conceptions of sample and their relationship to statistical inference. *Educational Studies in Mathematics*, 51, 257-270.

Conference Proceedings/Presentations (*)

*Saldanha, L. (2009, February). *On quantifying expectation: Insights from students' experiences in designing sampling simulations*. Paper presented at the 12th Conference on Research in Undergraduate Mathematics Education. Raleigh, NC.

*Saldanha, L. (2009, April). *Simulation design and conceiving probabilistic experiments and expectation*. Paper presented at the Research Pre-session of the 87th Annual Meeting of the National Council of Teachers of Mathematics. Washington, D.C.

Simon, M., Saldanha, L., McClintock, E., Karagoz Akar, G., Watanabe, T. & Zembat, I. (2007). Students' Learning through their Activity: Toward a Basis for a Scientific Approach to Task Design and Sequencing. In T. Lamberg (Ed.), *Proceedings of the 29th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Reno, Nevada.

Bartlo, J., Saldanha, L. A. & Kieran, C. (2007). Attending to structure and form in algebra: Challenges in designing CAS-centered instruction that supports construing patterns and relationships among algebraic expressions. In T. Lamberg (Ed.), *Proceedings of the 29th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Reno, Nevada.

Drijvers, P., & Kieran, C., with Boileau, A., Hitt, F., Tanguay, D., Saldanha, L., Guzmán, J. (2006). Reconciling factorizations made with CAS and with paper-and-pencil: The power of confronting two media. In J. Novotna et al. (Eds.), *Proceedings 30th PME* (Vol. 2, 473-480). Prague, Cz Repub.: PME.

Kieran, C., & Drijvers, P., with Boileau, A., Hitt, F., Tanguay, D., Saldanha, L., & Guzmán, J. (2006). Learning about equivalence, equality and equation in a CAS environment: The interaction of machine techniques, paper-and-pencil techniques, and theorizing. *Proceedings of the 17th ICMI Study, "Digital technologies and mathematics teaching and learning"* (CD version of the proceedings). Vietnam, December 2006.

*Larsen, S. & Saldanha, L. (2006). Conceiving of function composition as combining transformations: Lessons learned from the first iteration of an instructional design experiment. In Alatorre, S. Cortina, J. L., Saiz, M., and Méndez, A. (Eds.), *Proceedings of the 28th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Mérida, Mexico: Universidad Pedagógica Nacional.

*Saldanha, L. A. & Thompson, P. W. (2006). Investigating statistical unusualness in the context of a re-sampling activity: Students exploring connections between sampling distributions and statistical inference. *Proceedings of the 7th International Conference on Teaching Statistics (ICOTS-7)*, July 2006, Bahia, Brazil.

*Saldanha, L. A. & Kieran, C. (2005). A slippery slope between equivalence and equality: Exploring students' reasoning in the context of algebra instruction involving a computer algebra system. In G. M. Lloyd et al. (Eds.), *Proceedings of the 27th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Roanoke, VA: PME-NA.

Kieran, C. & Saldanha, L. (2005). Computer algebra systems (CAS) as a tool for coaxing the emergence of reasoning about equivalence of algebraic expressions. In H. L. Chick & J. L. Vincent (Eds.), *Proceedings of the 29th Annual Meeting of the International Group for the Psychology of Mathematics Education* (Vol. 3, pp. 193-200). Melbourne, Australia: PME.

*Saldanha, L. A. & Thompson, P. W. (2002). Students' scheme-based conceptions of sampling and their relationship to statistical inference. In D. Mewborn et al. (Eds.), *Proceedings of The Twenty Fourth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1305-1317). Athens, GA. ERIC clearinghouse, Columbus, OH.

Saldanha, L. A. & Thompson, P. W. (2001). Students' reasoning about sampling distributions and statistical inference. In R. Speiser & C. Maher (Eds.), *Proceedings of The Twenty Third Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 449-454). Snowbird, Utah. ERIC clearinghouse, Columbus, OH.

Thompson, P.W. & Saldanha, L. A. (2000). Epistemological analyses of mathematical ideas: A research methodology. In M. Fernandez (Ed.), *Proceedings of the Twenty Second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp.403- 408). Tucson, AZ. ERIC clearinghouse, Columbus, OH.

Thompson, P.W. & Saldanha, L. A. (2000). Conceptual issues in understanding sampling distributions. In M. Fernandez (Ed.), *Proceedings of the Twenty Second Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*. Tucson, AZ. ERIC clearinghouse, Columbus, OH.

*Cortina, J. L., Saldanha, L. A., Thompson, P. W. (1999). Multiplicative conceptions of arithmetic mean. In F. Hitt & M. Santos (Eds.), *Proceedings of the Twenty First Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 246-472). Cuernavaca, Morelos, Mexico. ERIC clearinghouse, Columbus, OH.

*Saldanha, L. A. & Thompson, P. W. (1998). Rethinking covariation from a quantitative perspective: Simultaneous continuous variation. In S. B. Berenson et al. (Eds.), *Proceedings of the Twentieth Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 298-304). Raleigh, NC: North Carolina State University. ERIC clearinghouse, Columbus, OH.

Presentations at Professional Meetings

Papers prefaced by an asterisk in the list above denote those that I presented at the associated conferences.

Submitted Work

Saldanha, L. A. (under review). *“Is this sample unusual?”: Exploring the deep structure of statistical inference in the context of an educational design experiment*. Saarbrücken, Germany: VDM Publishing.

Saldanha, L. A. *On conceiving probabilistic experiments and quantifying expectation: Insights from students’ experiences in designing sampling simulations*. Manuscript submitted for publication.

Saldanha, L. A., Thompson, P.W., & Liu, Y. (under review). Why statistical inference is hard to understand. *Cognition and Instruction*.

Work in Progress

Saldanha, L. A. & Kieran, C. (manuscript in progress). Conceptual issues in understanding algebraic equivalence: A case of coordinating arithmetic, algebraic, and linguistic dimensions. [Intended for submission to the *Journal of Mathematical Behavior*]

Saldanha, L. & Larsen, S. (manuscript in progress). Conceptual issues entailed in the learning of function composition: A micro-genetic analysis of a learner’s algebraic modeling and symbolizing process. [Intended for submission to *Educational Studies in Mathematics*]

Past Research Projects and Collaborations

Exploring Analysis of Mathematics Conceptual Learning (EAMCL), 2005-2009.

A collaboration with Martin Simon (New York University) involving teaching experiments designed to study students’ own activity in the learning of mathematics.

PSU Faculty Enhancement Grant: \$10,000, 2007-2008, Principal Investigator:

Exploring Conceptual Issues Entailed in the Learning of Function Composition,

A collaboration with Sean Larsen (Portland State University) that explores aspects of quantifying, symbolizing, and conceptualizing the mathematics of functions and their composition.

PSU Faculty Enhancement Grant: \$8300, 2005-2006, Principal Investigator:

Exploring the role of a computer algebra system as a tool for promoting the co-development of procedural and conceptual schemes in algebra learning,

A collaboration with Carolyn Kieran (Université du Québec à Montréal) that explores the learning of algebra in instructional contexts involving the use of a hand-held computer algebra system.

Teaching, Course Development, and Mentoring

Undergraduate courses taught

Arizona State University

MTE 598/MAT 494—Functions: Mathematical Tools for Science (Fall 2008)

Portland State University

MTH 95: Intermediate Algebra (Spring 2005)

MTH 343, 261: Introduction to Linear Algebra (Winter 2005, 2006, 2007, Fall 2006)

MTH 251: Calculus I (Fall 2007, Spring 2008, Summer 2008)

Graduate courses developed and taught

Arizona State University

Doctoral Seminar MTE 598: Research in Undergraduate Mathematics Education I (Fall 2008)

Doctoral Seminar MTE 598: Research in Undergraduate Mathematics Education II (Spring 2009)

Portland State University

Doctoral Seminar MTH 695: Research in the Learning of Algebra (Spring 2005)

Doctoral Seminar MTH 693: Research in Mathematical Thinking and Learning (Winter 2006)

Doctoral Seminar MTH 692: Research Methodology and Design in Mathematics Education (Winter 2007)

MTH 591: Experimental Probability and Statistics for Middle School Teachers (Fall 2005)

MTH 590: Computing in Mathematics for Middle School Teachers (Spring 2007)

Doctoral Committee Membership (ASU)

Kevin Moore (dissertation prospectus, Spring 2009)

Stacey Bowling (dissertation prospectus, Spring 2009)

Scott Courtney (dissertation prospectus, Summer 2009)

Doctoral Committee Membership (PSU)

(Chair) Craig Swinyard, Ph.D. (2008)

Matthew Ciancetta, Ph.D. (2007)

Jennifer Noll, Ph.D. (2007)

Master's Committees (PSU)

(Chair) Tammi Howe (MST, 2007)

Elise Lockwood (MST, 2006)

Joanna Bartlo (MST, 2006)

Laura Smoyer (MST, 2006)

Christy Stenberg (MST, 2005)

Jody Beake (MST, 2005)

Comprehensive Exam Committees (PSU)

Mathematics education exam: Jennifer Noll (2005)
Craig Swinyard (2006)

Second language (French) examiner: Jennifer Noll (2005)
Sarah Enoch (2006)

Analysis exam (2007): Elise Lockwood, Joanna Bartlo, Sarah Enoch

Departmental Service and Governance

Committees served (PSU): Mathematics Education Committee
Graduate Committee
Maseeh Colloquium Series Committee
Elections Committee
Mathematics Education Search Committee
Instructor Search Committee (chair, 2006)
Teacher Education Committee

Committees served (ASU): Undergraduate Committee
Mathematics Education Committee
Mathematics Awareness Month Committee

Community Outreach Activities

Co-designer and co-instructor of the course *Algebra Structures*— a professional development content course for in-service K-12 teachers taught in July-August 2005, 2006, 2007, as part of the Oregon Mathematics Leadership Institute (OMLI).

Professional Service

Research consultant for the following projects:

Mathematical Activity in Mathematics Learning (MAML),
Hosted at Arizona State University, October 2006

Exploring Analysis of Mathematics Conceptual Learning (EAMCL)
Penn State University (P.I. Martin Simon), June 2005, June 2006

Teacher Professional Continuum (P.I., Pat Thompson, Arizona State University)
Math and Science Partnership, (P.I., Marilyn Carlson, Arizona State University)
Arizona State University, March 2006

Journal reviewer: *International Electronic Journal of Mathematics Education* (2007)
Journal for Research in Mathematics Education (2004-2008)
Cognition and Instruction (2006-2009)
Canadian Journal for Science, Mathematics, and Technology Education (2007-2009)
(Editorial board member)

Conference proceedings reviewer: *North American Chapter of the International Group for the Psychology of Mathematics Education* (2005, 2006)
7th International Conference on Teaching Statistics (2006)
ICMI (2008)

Past Honors, Grants, and Fellowships

- Portland State University, Faculty Enhancement Grant (\$10,000), P.I., 2007-2008
- Portland State University Foundation Faculty Development Award (\$1000), 2006
- Portland State University, Faculty Travel Grant (\$1,100), 2006
- Portland State University, Faculty Travel Grant (\$430), 2005
- Portland State University, Faculty Enhancement Grant (\$8,300), P.I., 2005-2007
- Vanderbilt University, Otto Bassler Award for Outstanding Dissertation, 2005
- Université du Québec à Montréal, Post-doctoral Fellowship, Nov. 2003-Dec. 2004
- Dieter Lunkenbien Award for best master's thesis in mathematics education (Quebec, Canada), 1996.

Professional Affiliations

American Educational Research Association (past member)
International Group for the Psychology of Mathematics Education North American Chapter (PME-NA)
Mathematical Association of America (MAA)
National Council of Teachers of Mathematics (NCTM)

Language Proficiency

Fluent in French and Portuguese
Rudimentary knowledge of Spanish