

# Neil J. Hatfield

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## EDUCATION

- Ph.D. in Mathematics Education May 2019  
 Arizona State University, Tempe, AZ  
 Dissertation: *Students' Meanings for Stochastic Process While Developing a Conception of Distribution*
- Certificate in Statistics May 2013  
 Arizona State University, Tempe, AZ
- Master's of Science in Education: Teaching Mathematics May 2011  
 Northwest Missouri State University, Maryville, MO  
 Thesis Work: *The Impacts of Reading and Writing Mathematics with Undergraduate Students.*
- Advanced Studies, Master's Level Summer 2009  
 Doane University (formerly Doane College), Crete, NE
- Bachelor of Science, Mathematics May 2009  
 Doane University (formerly Doane College), Crete, NE

## PROFESSIONAL EXPERIENCE

### Assistant Research Professor

Pennsylvania State University

2019-Present

### Visiting Assistant Professor

University of Northern Colorado

2018-2019

- Instructor of Record
  - MATH 550: Applied Probability and Statistics Summer 2019
  - STAT 150: Introduction to Statistical Analysis Spring 2019
  - MED 701: Quantitative Research in Mathematics Education Spring 2019
  - STAT 150: Introduction to Statistical Analysis Fall 2018
    - Co-coordinator for the 22 sections of Stat 150
  - MATH 550: Applied Probability and Statistics Fall 2018
  - STAT 422: Distributions & Actuary (Directed Study) Fall 2018

### Instructor

Arizona State University, Tempe, AZ

2017-2018

- Instructor of Record
  - STP 420: Introductory Applied Statistics Spring 2018
    - Part of a redesign that builds off statistics education research to support students in developing productive meanings and to incorporate technology.

- STP 231: Statistics for the Biosciences Spring 2018
- STP 226: Elements of Statistics Fall 2017, Spring 2018
  - A modern redesign supporting students in building productive meanings
- STP 226: Elements of Statistics-Online Fall 2017
  - Created a fully online version of the redesigned STP226 course from scratch.
- MAT 210: Brief Calculus (Business Calculus) Fall 2017

### Graduate Teaching Associate

Arizona State University, Tempe, AZ

2013-2017

- Instructor of Record
  - STP 420: Introductory Applied Statistics Spring 2017
  - STP 231: Statistics for the Biosciences Spring 2014, Spring & Fall 2016
  - MAT 170: Pre-calculus Fall 2013, Summer A & B 2016
- Instructional Assistant
  - MTE 598: Research in Undergraduate Mathematics Education I Fall 2015
    - In cooperation with Dr. Kyeong Hah Roh
    - The first course in the Ph.D-Math Education core sequence

### Graduate Research Associate

Arizona State University, Tempe, AZ

2011-2015

Worked with Dr. Pat Thompson on Project Aspire (NSF Grant #DUE-1050595).

Responsibilities include generation of assessment items, collection and analysis of data (written assessment, interviews, classroom observations), and the generation of novel methods for assessing the impact of professional development. Assist in the communication of project results with the broader community.

### Statistical Consulting

Independent Service

2011-Present

Areas in which I've consulted include education (mathematics, music, and general), teacher professional development, psychology, and physical therapy.

### Graduate Assistant

Northwest Missouri State University, Maryville MO

2009-2011

- Study Group Leader Supervisor
  - Create and coordinate training of undergraduate and graduate students serving as study group leaders for the Math Skills I and Math Skills II courses, provide support and guidance for study group leaders, provide professional development opportunities, as well as develop an observation/evaluation form on the performance of study group leaders.
- Study Group Leader for Math Skills 2
  - Give additional/alternate instruction in the skills and concepts of the material included in an intermediate algebra course, offer student support, and construct review materials.
- Math Lab Tutor
  - Work with students one-on-one in courses including, but not limited to college algebra, general statistics 1, calculus 1 and 2, linear algebra, and multivariate calculus.

## PUBLICATIONS

### Refereed Journals

Thompson, P. W., **Hatfield, N. J.**, Yoon, H., Joshua, S., and Byerley, C. (2017) Covariational

reasoning among U.S. and South Korean secondary mathematics teachers. *Journal of Mathematical Behavior*, 48, pp. 95-111.

Thompson, P. W., Byerley, C., and **Hatfield N. J.** (2014) Schemes for thinking with magnitudes: A hypothesis about foundational reasoning abilities in algebra. In L. P. Steffe, L. L. Hatfield, & K. C. Moore (Eds.), *Epistemic algebra students: Emerging models of students' algebraic knowing* (pp. 1-24). Laramie, WY: University of Wyoming.

Thompson, P. W., Byerley, C., and **Hatfield, N. J.** (2013). A conceptual approach to calculus made possible by technology. *Computers in the Schools*.

### Chapters in Edited Books

Middleton, J. A., Tallman, M., **Hatfield, N. J.**, & Davis, O. (2015). Taking the severe out of perseverance: Strategies for building mathematical determination. In N. Alpert & C. Kurose, (Eds.), *Mathematics Instruction for Perseverance*. Chicago, IL: Spencer Foundation.

### Conference Proceedings

**Hatfield, N. J.** (2018). Students' conveyed meanings for probability. In M. A. Sorto, A. White, & L. Guyot (Eds.), *Looking back, looking forward. Proceedings of the Tenth International Conference on Teaching Statistics*. Kyoto, Japan; Voorburg, The Netherlands: International Statistical Institute. Retrieved from [http://icots.info/10/proceedings/pdfs/ICOTS10\\_6H1.pdf?1531364281](http://icots.info/10/proceedings/pdfs/ICOTS10_6H1.pdf?1531364281)

**Hatfield, N. J.** (2016). An initial look at students' conveyed meanings for probability. In T. Fukawa-Connelly, N. Infante, M. Wawro, and S. Brown (Eds.), *Proceedings of the 19<sup>th</sup> Annual Conference on Research In Undergraduate Mathematics Education* (pp. 190-203). Pittsburgh, Pennsylvania: Mathematical Association of America.

Musgrave, S., **Hatfield, N. J.**, and Thompson, P. W. (2015). Teachers' meanings for the substitution principle. In T. Fukawa-Connelly, N. E. Infante, K. Keene & M. Zandieh (Eds.), *Proceedings of the 18<sup>th</sup> Annual Conference on Research in Undergraduate Mathematics Education* (pp. 801-808). Pittsburgh, Pennsylvania: Mathematical Association of America.

Musgrave, S., **Hatfield, N. J.**, and Thompson, P. W. (2015). Calculus students' meanings for difference. In T. Fukawa-Connelly, N. E. Infante, K. Keene & M. Zandieh (Eds.), *Proceedings of the 18<sup>th</sup> Annual Conference on Research in Undergraduate Mathematics Education* (pp. 809-814). Pittsburgh, Pennsylvania: Mathematical Association of America.

Joshua, S., Musgrave, S., **Hatfield, N. J.**, & Thompson, P. W. (2015). Frames of reference. In T. Fukawa-Connelly, N. E. Infante, K. Keene & M. Zandieh (Eds.), *Proceedings of the 18<sup>th</sup> Annual Conference on Research in Undergraduate Mathematics Education* (pp. 31-44). Pittsburgh, Pennsylvania: Mathematical Association of America.

**Hatfield, N. J.** (2013). The action, process, object, and schema theory for sampling/sampling distribution. In S. Brown, G. Karakok, K. H. Roh, & M. Oehrtman (Eds.) *Proceedings of the 16<sup>th</sup> Annual Conference on Research in Undergraduate Mathematics Education* (Vol. 1, pp. 296-307). Denver, Colorado: Mathematical Association of America.

Byerley, C., **Hatfield, N. J.**, & Thompson, P. W. (2012). Calculus Student Understandings of Division and Rate. In S. Brown, S. Larsen, K. Marrongelle, & M. Oehrtman (Eds.), *Proceedings of the 15th Annual Conference on Research in Undergraduate*

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Mathematics Education (pp. 358–363). Portland, Oregon: Mathematics Association of America.

## PRESENTATIONS

### International and National

- Hatfield, N.J.** (2019, May). Students' images of randomness post-instruction. The United States Conference on Teaching Statistics. State College, Pennsylvania.
- Hatfield, N. J.** (2018, July). Students' conveyed meanings for probability. The Tenth International Conference on Teaching Statistics. Kyoto, Japan.
- Hatfield, N. J.** (2018, July). Challenges of Teaching Probability. Invited Session Chair. The Tenth International Conference on Teaching Statistics. Kyoto, Japan.
- Hatfield, N. J.** (2016, February). Probabilistic thinking: An initial look at students' meanings for probability. The 19th Annual Conference on Research in Undergraduate Mathematics Education. Pittsburgh, Pennsylvania.
- Musgrave, S., **Hatfield, N. J.**, and Thompson, P. W. (2015, February). Teachers' meanings for the substitution principle. The 18th Annual Conference on Research in Undergraduate Mathematics Education. Pittsburgh, Pennsylvania.
- Musgrave, S., **Hatfield, N. J.**, and Thompson, P. W. (2015, February). Calculus students' meanings for difference. The 18th Annual Conference on Research in Undergraduate Mathematics Education. Pittsburgh, Pennsylvania.
- Joshua, S., Musgrave, S., **Hatfield, N. J.**, & Thompson, P. W. (2015, February). Frames of reference. The 18th Annual Conference on Research in Undergraduate Mathematics Education. Pittsburgh, Pennsylvania.
- Yoon, H., **Hatfield, N. J.**, and Thompson, P. W. (2014, July). Teachers' meanings for function notation. The 38<sup>th</sup> Meeting of the International Group for the Psychology of Mathematics Education. Vancouver, BC, Canada.
- Hatfield, N. J.** (2013, February). The Action, Process, Object, and Schema Theory of Sampling/Sampling Distribution. The 16th Annual Conference for Research in Undergraduate Mathematics Education in Denver, CO.
- Byerley, C., & **Hatfield, N. J.** (2013, February). Pre-service Secondary Teachers' Meanings for Fractions and Division. The 16th Annual Conference for Research in Undergraduate Mathematics Education in Denver, CO.
- Thompson, P. W., **Hatfield, N. J.**, Byerley, C., & Carlson, M. P. (2013, February). Under the Radar: Foundational Meanings that Secondary Mathematics Teachers Need, Do Not Have, but Colleges Assume. The 16th Annual Conference for Research in Undergraduate Mathematics Education in Denver, CO.
- Byerley, C., & **Hatfield, N. J.** (2013, January). University Calculus Students' Meanings for Fraction and Quotient. The 2013 Joint Mathematics Meetings for the American Mathematical Society and the Mathematical Association of America in San Diego, CA.
- Byerley, C., **Hatfield, N. J.**, Carlson, M. P., & Thompson, P. W. (2013, January). Assessing High School Teachers' Mathematical Meanings for Teaching Secondary Mathematics. The 2013 Joint Mathematics Meetings for the American Mathematical Society and the Mathematical Association of America in San Diego, CA.

Byerley, C., **Hatfield, N. J.**, & Thompson, P. W. (2012, February). Calculus Student Understandings of Quotient and Rate. The 15th Annual Conference for Research in Undergraduate Mathematics Education in Portland, OR.

**Hatfield, N. J.** (2011, April). Raising achievement through reading and writing mathematics with undergraduate students. The 2011 NCTM Annual meeting and exposition in Indianapolis, IN.

## Regional

**Hatfield, N. J.** (2016, September). Solving problems with statistics. A presentation and activity session given at Arizona State University's Math Day.

Thompson, P. W., **Hatfield, N. J.**, & Byerley, C. (2012, March). An Approach to Calculus Made Possible by *Technology*. A presentation at the American Mathematical Society Central Sectional Meeting. University of Kansas, Lawrence, KS.

**Hatfield, N. J.** (2011, March). *Tanks, planes, and UNICEF: Reasoning and sense making with data analysis*. A presentation on three statistics lessons to area secondary math teachers for the 2011 Northwest Missouri State University Math Olympiad.

**Hatfield, N. J.** (2011, March). *How statistics won World War II*. A presentation on the use of statistics during World War II to area high school students for the 2011 Northwest Missouri State University Math Olympiad.

**Hatfield, N. J.** (2010, April). *Reading and writing mathematics with developmental students*. A paper presented at the 2010 Missouri Section meeting of MAA.

## Local

**Hatfield, N. J.** (2018, August). Examining students' conveyed meanings for probability. A presentation given for the School of Mathematical Sciences at the University of Northern Colorado.

**Hatfield, N. J.** (2017, September). Tutoring for classes focused conceptual understanding. A presentation given at Arizona State University for the University Academic Success Program.

**Hatfield, N. J.** (2015, October). Bootstrapping across platforms. A presentation given at Arizona State University for the Graduate Statistics Club.

Thompson, P. W., **Hatfield, N. J.**, Byerley, C., & Carlson, M. P. (2013, February). Assessing Secondary Teachers' Mathematical Meanings for Teaching Secondary Mathematics. A presentation of research given to the Mathematics Education Seminar of Arizona State University.

**Hatfield, N. J.** (2011, March). Raising achievement through reading and writing mathematics with undergraduate students. An overview of a paper presented at the 2011 Northwest Missouri State University's Celebration of Quality in Maryville, MO.

**Hatfield, N. J.** (2009, November). Teaching math through games. A professional development presentation given to the Northwest Missouri State University MathEd club.

## APPLETS AND PROGRAMS

**Hatfield, N. J.** (2019) *StatsTools*, v. 4. [JMP Add-In]. A suite of tools to extend JMP's capabilities by including an ANOVA Screens tool, an effect size calculator, and support for students.

- Hatfield, N. J.** (2017). *First Day Activity*. An applet for students to explore a simulated outbreak and develop a need for data and statistics. Available:  
<https://neilhatfield.github.io/statApps/Day1Activity.html>
- Hatfield, N. J.** (2017). *Four Rooms*. An applet designed to help students explore the differences between deterministic and stochastic processes. Available:  
<https://neilhatfield.github.io/statApps/FourRooms.html>
- Hatfield, N. J.** (2017). *Sequences 1*. An applet for students to explore checking a sequence for the appearance of randomness. Available: <https://neilhatfield.github.io/statApps/Sequences.html>
- Hatfield, N. J.** (2017). *Fish Sampling*. An applet to allow students to explore several basic sampling methods. Available: <https://neilhatfield.github.io/statApps/FishSampling.html>
- Hatfield, N. J.** (2017). *People Sampling*. An applet to allow students to explore simple random sampling based off of the 2010 Census data for the USA. Available:  
<https://neilhatfield.github.io/statApps/PeopleSamplingWeb.html>
- Hatfield, N. J. and Sander, G.** (2017). *StatCalc*. An online calculator for calculating cumulative probabilities from common named distributions. Available:  
<https://neilhatfield.github.io/statCalc/statcalc.html>

## CONFERENCES

- The United States Conference on Teaching Statistics (USCOTS), May 2019, State College, Pennsylvania.
- The Tenth Intentional Conference on Teaching Statistics (ICOTS 10), July 2018, Kyoto, Japan.
- Conference for Research in Undergraduate Mathematics Education, 21<sup>st</sup> Annual, February 2018, San Diego, CA.
- Conference for Research in Undergraduate Mathematics Education, 19<sup>th</sup> Annual, February 2016, Pittsburgh, PA.
- Conference for Research in Undergraduate Mathematics Education, 18<sup>th</sup> Annual, February 2015, Pittsburgh, PA.
- The Ninth International Conference on Teaching Statistics (ICOTS 9), July 2014, Flagstaff, AZ.
- Conference on Epistemic Algebra Students, June 2013, Athens, GA.
- Conference for Research in Undergraduate Mathematics Education, 16<sup>th</sup> Annual, February 2013, Denver, CO.
- Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, January 2013, San Diego, CA.
- International STEM Research Symposium: Quantitative Reasoning in Mathematics & Science Education hosted by WISDOM<sup>e</sup> of University of Wyoming, the NSF Pathways Project, Colorado State University and Georgia Southern University, May-June 2012, Savannah GA.
- Central Sectional Meeting of the American Mathematical Society, March 2012, Lawrence, KS.
- Conference for Research in Undergraduate Mathematics Education, 15<sup>th</sup> Annual, February 2012, Portland, OR.
- National Council of Teachers of Mathematics Annual National Conference, April 2011, Indianapolis, IN.

Pedagogy Matters: Developmental Pedagogy, February 2011, Online Jam hosted by Global Skills for College Completion.

Missouri Mathematics Pre-service Teacher Conference, jointly hosted by the University of Central Missouri and Missouri State University, April 2011, Lake Ozark, MO.

Missouri Sectional Meeting of the Mathematical Association of America, April 2010, Warrensburg, MO.

National Council of Teachers of Mathematics Regional Conference, October 2008, Oklahoma City, OK.

## ADVISING

### Masters Students

Cierra Street (MA-Mathematics, 2019). Project title: *When no effect is the best effect: An examination of the relationship between students' demographics and their ALEKS score.*

Evan Czysz (MA-Mathematics, 2010). Project title: *Modified joint rewards system in a mathematics for elementary school teachers classroom.*

## SERVICE

### Affiliations

American Statistical Association	2015-Present
Mathematical Association of America	2009-Present
American Mathematical Society	2012-Present
National Council of Teachers of Mathematics	2009-Present
Graduate Statistics Club, Arizona State University	2013-2018
Northwest Missouri State University MathEd Club	2009-2011
National Education Association	2006-2009
Nebraska State Education Association	2006-2009
Student Education Association of Nebraska, Doane University	2006-2009

### Referee

<i>Problems, Resources, and Issues in Mathematics Undergraduate Studies</i>	2019-Present
The Tenth International Conference on Teaching Statistics	2017-2018
Conference on Research in Undergraduate Mathematics Education	2017
<i>The Canadian Journal of Science, Mathematics, and Technology Education</i>	2014-2015
<i>Mathematics Teacher</i>	2011-2015

### Committees

Graduate Statistics Club, Executive Committee	2015
Arizona State University, Tempe, AZ	
Council on Teacher Education	2010-2011
Northwest Missouri State University, Maryville, MO	
Developmental Mathematics Review Committee,	2010-2011
Northwest Missouri State University, Maryville, MO	

### Awards

ASU's College of Liberal Arts and Sciences Outstanding Lecture of Year Nominee	2017-2018
Robert G. Maule Excellence in Teaching Mathematics Award	2017
Graduate and Professional Student Association's Teaching Excellence Award	2016-2017
Honorable Citation-RUME ( <i>Frames of Reference</i> paper)	2015
Floyd L. Downs Teaching of Mathematics Fellowship Award	2014

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**Service**

Mentor—ASU's DataFest	2018
Organizer—LogaRythms, ASU's Night of the Open Door	2015, 2016, 2017
Session Organizer—ASU Math Day	2016
Organizer—3D Fractals, ASU's Night of the Open Door	2014, 2015
Volunteer—Crypto-Rally, Arizona State University	2015, 2016, 2017