

HEATHER LYNN JOHNSON

Associate Professor
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I study students' math reasoning. I design tasks to provide students opportunities to expand their math reasoning. I teach teachers to grow their students' math reasoning.

EDUCATION

Institution	Degree	Date Received	Major
The Pennsylvania State University	Ph.D.	08/2010	Curriculum & Instruction: Mathematics Education
The Pennsylvania State University	M.Ed.	08/1997	Teaching & Curriculum
The Pennsylvania State University	B.S.	05/1992	Mathematics
<u>Certificates</u>			
National Board for Professional Teaching Standards	Certificate	11/2005	National Board Certification, Mathematics, Adolescence and Young Adulthood
Commonwealth of PA	Certificate	01/1996	Instructional II Certificate, Secondary Mathematics

PROFESSIONAL EXPERIENCE

Dates	Position
6/2016 – present	Associate Professor of Mathematics Education School of Education and Human Development University of Colorado Denver
08/2010 – 6/2016	Assistant Professor of Mathematics Education School of Education and Human Development University of Colorado Denver
06/2005 - 08/2010	Mid-Atlantic Center Graduate Research Fellow College of Education The Pennsylvania State University
08/1992 - 06/2005	Mathematics Teacher Central York High School York, PA

PEER REVIEWED PUBLICATIONS

JOURNAL ARTICLES

- 2020 **Johnson, H. L.** (2020). Task design for graphs: Rethink multiple representations with variation theory. *Mathematical Thinking and Learning*.
<https://doi.org/10.1080/10986065.2020.1824056>
- Johnson, H. L.**, McClintock, E., & Gardner, A. (2020). Opportunities for reasoning: Digital task design to promote students' conceptions of graphs as relationships between quantities. *Digital Experiences in Mathematics Education*. 6(3), 340-366.
<https://doi.org/10.1007/s40751-020-00061-9>
- 2019 **Johnson, H. L.**, Dunlap, J., Verma, G., McClintock, E., Debay, D., & Bourdeaux, B. (2019). Video based teaching playgrounds: Designing online learning opportunities to foster professional noticing of teaching practices. *Tech Trends*. 63(2), 160-169.
<https://doi.org/10.1007/s11528-018-0286-5>
- 2018 **Johnson, H. L.** & McClintock, E. (2018). A link between students' discernment of variation in unidirectional change and their use of quantitative variational reasoning. *Educational Studies in Mathematics*. 97(3), 299-316. doi: 10.1007/s10649-017-9799-7
- 2017 **Johnson, H. L.**, Coles, A., & Clarke, D. (2017). Mathematical tasks and the student: Navigating "tensions of intentions" between designers, teachers, and students. *ZDM: The International Journal on Mathematics Education*, 49(6), 813–822.
doi.org/10.1007/s11858-017-0894-0
- Johnson, H. L.**, McClintock, E., & Hornbein, P. (2017). Ferris wheels and filling bottles: a case of a student's transfer of covariational reasoning across tasks with different backgrounds and features. *ZDM: The International Journal on Mathematics Education*, 49(6), 851–864. doi.org/10.1007/s11858-017-0866-4
- 2016 Dunlap, J. C., Verma, G., & **Johnson, H. L.** (2016). Presence+Experience: A framework for the purposeful design of presence in online courses. *Tech Trends*, 60(2), 145-151.
- Johnson, H. L.**, Hornbein, P., & Azeem, S. (2016). Investigating functions with a Ferris wheel. *Mathematics Teacher*. 110(5), 345-351.
- Johnson, H. L.**, Hornbein, P., & Bryson, D. (2016). Designing online playgrounds for learning mathematics. *Mathematics Teacher*, 110(4), 298-303.
- 2015 **Johnson, H. L.** (2015) Secondary students' quantification of ratio and rate: A framework for reasoning about change in covarying quantities. *Mathematical Thinking and Learning*, 17(1), 64-90.
- Johnson, H. L.** (2015). Together yet separate: Students' associating amounts of change in quantities involved in rate of change. *Educational Studies in Mathematics*, 89(1), 89-110.

- 2014 **Johnson, H. L.** (2014). A role of context in constructivist model building: What problem is the learner solving? *Constructivist Foundations*, 9(3), 339-341.
- Johnson, H. L.**, Blume, G.W., Shimizu, J., Graysay, D., & Konnova, S. (2014). A teacher's conception of definition and use of examples when doing and teaching mathematics. *Mathematical Thinking and Learning*, 16(4), 285-311.
- 2013 **Johnson, H. L.** (2013). Predicting amounts of change in quantities. *Mathematics Teaching in the Middle School*. 19(5), 260-265.
- Johnson, H. L.** (2013). Reasoning about quantities that change together. *Mathematics Teacher*, 106(9), 704-708.
- Castillo-Garsow, C., **Johnson, H. L.**, & Moore, K. (2013). Chunky and smooth images of change. *For the Learning of Mathematics*, 33(3), 31-37.
- Tzur, R., **Johnson, H. L.**, McClintock, E., Xin, Y. P., Si, L., Woodward, J., Hord, C., & Jin, X. (2013). Distinguishing schemes and tasks in children's development of multiplicative reasoning. *PNA*, 7(3), 85-101.
- 2012 **Johnson, H. L.** (2012). Reasoning about variation in the intensity of change in covarying quantities involved in rate of change. *Journal of Mathematical Behavior*, 31(3), 313-330.
- 2010 **Johnson, H. L.** (2010). Investigating the fundamental theorem of calculus. *Mathematics Teacher*, 103(6), 430-435.
- CONFERENCE PROCEEDINGS (Since 2016)*
- 2019 Bikner-Ahsbabs, A., Bakker, A., **Johnson, H. L.**, Chan, E. (2019). Introduction to the thematic working group 17 on theoretical perspectives and approaches in mathematics education research of CERME 11. In U. T. Jankvist, M. van den Heuvel-Panhuizen, & M. Veldhuis (Eds.), *Proceedings of the 11th Congress of the European Society for Research in Mathematics Education (CERME 11)* (pp. 3020-3027). Utrecht, The Netherlands: Utrecht University.
- Gardner, A., Smith, A., & **Johnson, H. L.** (2019) Humanizing the coding of college algebra students' attitudes towards math. In Weinberg, A., Moore-Russo, D., Soto, H., & Wawro, M. (Eds.). *Proceedings of the 22nd Annual Conference on Research in Undergraduate Mathematics Education* (pp. 1113-1114). Oklahoma City, OK: RUME.
- Johnson, H. L.**, Gardner, A., Smith, A., Olson, G., & Wang, X. (2019). Interacting with dynamic computer activities impacts college algebra students' math attitudes and performance. In Otten, S., Candela, A., de Araujo, Z., Haines, C., & Munter, C. (Eds.). *Proceedings of the 41st Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1424-1433). St Louis, MO: University of Missouri.

Johnson, H. L., McClintock, E., & Gardner, A. (2019). Leveraging difference to promote students' conceptions of graphs as representing relationships between quantities. In U. T. Jankvist, M. van den Heuvel-Panhuizen, & M. Veldhuis (Eds.), *Proceedings of the 11th Congress of the European Society for Research in Mathematics Education (CERME 11)* (pp. 4539-4546). Utrecht, The Netherlands: Utrecht University.

Johnson, H. L., McClintock, E., & Gardner, A. (2019). Locally integrating theories to investigate students transfer of mathematical reasoning. In U. T. Jankvist, M. van den Heuvel-Panhuizen, & M. Veldhuis (Eds.), *Proceedings of the 11th Congress of the European Society for Research in Mathematics Education (CERME 11)* (pp. 3114-3121). Utrecht, The Netherlands: Utrecht University.

Jorgensen, C., Smith, A., Tzur, R., & **Johnson, H. L.** (2019). Unit distinction as a prerequisite for multiplicative reasoning: A case study of Adam's unit transformation. In Otten, S., Candela, A., de Araujo, Z., Haines, C., & Munter, C. (Eds.). *Proceedings of the 41st Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 874-881). St Louis, MO: University of Missouri.

Tzur, R., Hodkowski, N., Wei, B., Davis, A., Ferrara, M., Jorgensen, C., & **Johnson, H. L.** (2019). A teacher's conceptual 'aha' enables real-time adaptation to students' multiplicative reasoning. In M. Graven, H. Venkat, A. Essien & P. Vale (Eds.). *Proceedings of the 43rd Conference of the International Group for the Psychology of Mathematics Education* (Vol. 3, pp. 390-397). Pretoria, South Africa: PME.

2018

Johnson, H. L., Kalir, J., Olson, G., Gardner, A., Smith, A., & Wang, X. (2018). Networking theories to design a fully online assessment of students' covariational reasoning. In Hodges, T.E., Roy, G. J., & Tyminski, A. M. (Eds.). *Proceedings of the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1343-1346). Greenville, SC: University of South Carolina & Clemson University.

Johnson, H. L., McClintock, E., & Gardner, A. (2018). Promoting secondary students' shifts to covariational reasoning: Theory networking and digital task design. In E. Bergqvist, M. Österholm, C. Granberg, & L. Sumpter (Eds.). *Proceedings of the 42nd Conference of the International Group for the Psychology of Mathematics Education* (Vol. 5, p. 78). Umeå, Sweden: PME.

Johnson, H. L., McClintock, E., Kalir, J., & Olson, G. (2018) Networking theories to design dynamic covariation techtivities for college algebra students. In (Eds.) A. Weinberg, C. Rasmussen, J. Rabin, M. Wawro, and S. Brown, *Proceedings of the 21st Annual Conference on Research in Undergraduate Mathematics Education* (pp. 1224-1233), San Diego, CA: RUME.

Johnson, H. L., Tzur, R., Hodkowski, N., Jorgensen, C., Wei, B., Wang, X., & Davis, A. (2018). A written, large-scale assessment measuring gradations in students' multiplicative reasoning. In E. Bergqvist, M. Österholm, C. Granberg, & L. Sumpter (Eds.).

Proceedings of the 42nd Conference of the International Group for the Psychology of Mathematics Education (Vol. 3, pp. 163-170). Umeå, Sweden: PME.

Tzur, R., **Johnson, H. L.**, Hodkowski, N., Jorgensen, C., Nathenson-Mejia, S., Wei, B., Smith, A., & Davis, A. (2018). Impact of a student-adaptive PD program on students' multiplicative reasoning. In Hodges, T.E., Roy, G. J., & Tyminski, A. M. (Eds.). *Proceedings of the 40th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1084-1090). Greenville, SC: University of South Carolina & Clemson University.

Tzur, R., Wei, B., Smith, A., Norton, N., Davis, A., & **Johnson, H. L.** (2018). Same unit coordination: A conceptual screener for mixed unit coordination and base-10, place value reasoning. In E. Bergqvist, M. Österholm, C. Granberg, & L. Sumpter (Eds.). *Proceedings of the 42nd Conference of the International Group for the Psychology of Mathematics Education* (Vol. 4, pp. 323-330). Umeå, Sweden: PME.

2017 **Johnson, H. L.**, McClintock, E., Hornbein, P., Gardner, A., & Grieser, D. (2017). When a critical aspect is a conception: Using multiple theories to design dynamic computer environments and tasks to foster students' discernment of covariation. In Dooley, T., & Gueudet, G. (Eds.). *Proceedings of the Tenth Congress of the European Society for Research in Mathematics Education* (CERME10, pp. 2738-2745). Dublin, Ireland: DCU Institute of Education and ERME.

Tzur, R., **Johnson, H. L.**, Norton, A., Davis, A., Wang, X., Ferrara, M., Jorgensen, C. & Wei, B. (2017). Conception of number as a composite unit predicts students' multiplicative reasoning: Quantitative corroboration of Steffe's model. In B. Kaur, W. K. Ho, T. L. Toh, & B. H. Choy (Eds.), *Proceedings of the 41st Conference of the International Group for the Psychology of Mathematics Education* (Vol. 4, pp. 289-296). Singapore: PME.

2016 Hodkowski, N. M., Hornbein, P., Gardner, A., **Johnson, H. L.**, Jorgensen, C., & Tzur, R. (2016, November). Designing a stage-sensitive written assessment of elementary students' scheme for multiplicative reasoning. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.), *Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1581-1587). Tucson, AZ: The University of Arizona.

PEER REVIEWED PUBLICATIONS FOR POPULAR AUDIENCES

2018 **Johnson, H. L.** (2018, February 27). Helping students see how graphs work. *Edutopia*. Retrieved from [edutopia.org/article/helping-students-see-how-graphs-work](https://www.edutopia.org/article/helping-students-see-how-graphs-work)

PEER REVIEWED BOOK CHAPTERS (Selected)

2018 Jansen, A., **Johnson, H. L.**, Gardner, A. (2018). Mathematics problem solving: Handout for school. In G.G. Bear & K. Minke (Eds.). *Helping handouts to support students at school and home* (pp. 1-4). Bethesda, MD: National Association of School Psychologists.

2016 **Johnson, H. L.** (2016). Quantitative reasoning in mathematics education: Directions in research and practice. In R. A. Duschl & A. Bismack (Eds.), *Reconceptualizing STEM*

education: The central role of practices (pp. 149-166). London: Routledge, Taylor & Francis

- 2015 **Johnson, H.**, Karunakaran, S., Fox, R., & McClintock, E. (2015). Square root of i : Situation 9 from the MACMTL-CPTM situations project. In M. K. Heid, P. S. Wilson, with G. W. Blume (Eds.), *Mathematical understanding for secondary teaching: A framework and classroom-based situations* (pp. 171-177). Charlotte, NC: Information Age Publishing
- Johnson, H.**, Karunakaran, S., McClintock, E., Nazarewicz, P., Jacobson, E., & Edenfield, K. (2015). Absolute value in complex plane: Situation 7 from the MACMTL-CPTM situations project. In M. K. Heid, P. S. Wilson, with G. W. Blume (Eds.), *Mathematical understanding for secondary teaching: A framework and classroom-based situations* (pp. 155-161). Charlotte, NC: Information Age Publishing
- Johnson, H.**, McClintock, E., Zbiek, R. M., Gleason, B., Broderick, S., & Wilson J. (2015). Graphing $\sin(2x)$: Situation 36 from the MACMTL-CPTM situations project. In M. K. Heid, P. S. Wilson, with G. W. Blume (Eds.), *Mathematical understanding for secondary teaching: A framework and classroom-based situations* (pp. 385-389). Charlotte, NC: Information Age Publishing

EXTERNAL GRANTS FUNDED

- 2020 *Promoting Mathematical Reasoning and Transforming Instruction in College Algebra (ITsCRITiCAL)*. PI: **Heather Lynn Johnson**, Co-PIs: Belin Tsinnajinnie, Courtney Donovan, Gary Olson, and Bikai Nie. National Science Foundation (DUE 2013186). Received: **\$1,600,000**
- 2017 *Implementing Techivities to Promote Students' Covariational Reasoning in College Algebra (ITSCoRe)*. PI: **Heather Lynn Johnson**, Co-PIs: Jeremiah Kalir, Gary Olson. National Science Foundation (DUE 1709903). Received: **\$300,000**
- Recruiting and Preparing Exemplary Mathematics and Science Teachers through a Teacher Residency Model*. PI: Doris Kimbrough, Co-PIs: Laurel Hartley, Robert Talbot, Michael Jacobson, **Heather Johnson**. National Science Foundation (DUE 1660770). Received: **\$1,200,000**.
- 2015 *Adaptive Pedagogy for Elementary Teachers: Promoting Multiplicative and Fractional Reasoning to Improve Students' Preparedness for Middle School Mathematics*. PI: Ron Tzur, Co-PIs: Xin Wang, Alan Davis, **Heather Johnson**, Michael Ferrara. National Science Foundation (DRL 1503206). Received: **\$3,000,000**.

OTHER INDICATORS OF SCHOLARLY AND CREATIVE ACTIVITY

AUDIOVISUAL MEDIA

- 2018 **Johnson, H. L.** (2018, April 17). *Global Math Department Webinar: Helping students see how graphs work* [Video]. Retrieved from: <https://www.bigmarker.com/GlobalMathDept/Helping-Students-See-How-Graphs-Work?bmid=376c71a2106a>

- Johnson, H. L.** (2018, March 19). *MathEd Podcast Episode 1805* [Audio Podcast]. Retrieved from: https://www.podomatic.com/podcasts/mathed/episodes/2018-03-19T08_32_36-07_00
- 2015 Annenberg Learner (2015). *Reading and writing in mathematics* [Video]. Retrieved from: <http://www.learner.org/courses/readwrite/video-detail/reading-and-writing-mathematics.html>. Education Experts: Jacob Foster, **Heather Lynn Johnson**, Magdalene Lampert.
- 2013 **Johnson, H. L.** (2013, April 18). *Reasoning about quantities that change together* [Audio Podcast]. Retrieved from: <http://www.nctm.org/Conferences-and-Professional-Development/Webinars-and-Webcasts/Reasoning-about-Quantities-That-Change-Together/>
- INSTRUCTIONAL MATERIALS (Selected)*
- 2020 Shvarts, A., & **Johnson, H.** (n.d). *Graphs*. Utrecht University: Embodied Design. <https://embodieddesign.sites.uu.nl/activity/>
- 2019 Olson, G., Gardner, A., & **Johnson, H. L.** (2019). *Changing Kite and Dynamic Tent Facilitation Guides*. ITSCoRe. <https://itscore.cu.studio/techtivities/>
- Olson, G., Gardner, A., & **Johnson, H. L.** (2019). *Facilitation guide for cannon man*. ITSCoRe. from <https://itscore.cu.studio/techtivities/>
- Olson, G., Gardner, A., & **Johnson, H. L.** (2019). *Facilitation guide for toy car*. ITSCoRe. <https://itscore.cu.studio/techtivities/>
- Olson, G., Gardner, A., & **Johnson, H. L.** (2019). *Ferris wheel facilitation guide*. ITSCoRe. <https://itscore.cu.studio/techtivities/>
- 2018 **Johnson, H. L.** (2018). *How graphs work*. Desmos. <https://teacher.desmos.com/curriculum/view/5b60949dd5e0c30f58408405>
- Johnson, H. L.** (2018). *The changing kite*. Desmos. <https://teacher.desmos.com/activitybuilder/custom/5b5ce3539ee0953106ad93e7>
- Johnson, H. L.** (2018). *The dynamic tent*. Desmos. <https://teacher.desmos.com/activitybuilder/custom/5b58e70f82e28e59fd47115d>
- 2017 **Johnson, H. L.** (2017). Ferris Wheel: Height v. Width. Retrieved 1 February 2018 from Desmos web site, <https://teacher.desmos.com/activitybuilder/custom/599e0813a7e37e113af6c5b9>
- Johnson, H. L.** (2017). Ferris Wheel: Width v. Distance. Retrieved 1 February 2018 from Desmos web site, <https://teacher.desmos.com/activitybuilder/custom/599de9948ac1a60bcfcd20d8>

Johnson, H. L. (2017). Ferris Wheel: Height v. Distance. Retrieved 1 February 2018 from Desmos web site, <https://teacher.desmos.com/activitybuilder/custom/59a7272c5e844d0a1dfccfe7>

Johnson, H. L. (2017). The Toy Car. Retrieved 19 July 2017 from Desmos web site, <https://teacher.desmos.com/activitybuilder/custom/58bf63e46955550a3dc61f59>.

Johnson, H. L. (2017). The Cannon Man. Retrieved 22 January 2017 from Desmos web site, <https://teacher.desmos.com/activitybuilder/custom/582516579ecbaeb00793586e>.

PEER REVIEWED PRESENTATIONS AT MEETINGS/CONFERENCES (Since 2016)

- 2020 **Johnson, H. L.**, Olson, G., Gardner, A., Smith, A., & Wang, X. (2020, Jan). Cartesian graphs, covariational reasoning, and powerful positioning in college algebra. *Joint Mathematics Meetings*, Denver, CO.
- Johnson, H. L.**, Olson, G., Gardner, A., Smith, A., & Wang, X. (2020, Jan). Implementing techtivities to promote students' covariational reasoning in college algebra. *Joint Mathematics Meetings*, Denver, CO.
- 2019 **Johnson, H. L.** (2019, July) Share your practice: Write for the Colorado Math Teacher journal. *Annual Meeting of the Colorado Council of Teachers of Mathematics*, Denver, CO.
- Gardner, A., & Smith, A, Olson, G., & **Johnson, H. L.** (2019, June): An asset based approach to analyzing college algebra students' reasoning on graphing tasks. *National Inquiry Based Learning Conference*, Denver, CO.
- 2018 Smith, A., Gardner, A., & **Johnson, H. L.** (2018, August) Techtivities: Help students see how graphs work. *Annual Meeting of the Colorado Council of Teachers of Mathematics*, Denver, CO.
- Olson, G., **Johnson, H. L.**, & Kalir, J. (2018, August). Implementing Desmos techtivities to promote students' covariational reasoning. *2018 Math Fest Meeting of the Mathematical Association of America*, Denver, CO.
- Johnson, H. L.**, Olson, G., Kalir, J., Gardner, A., & Smith, A. (2018, June): Questioning our questions: From soliciting answers to eliciting reasoning. *National Inquiry Based Learning Conference*, Austin, TX.
- Olson, G., **Johnson, H. L.**, Kalir, J., Gardner, A., & Smith, A. (2018, June): Two graphs are better than one: Techtivities for College Algebra. *National Inquiry Based Learning Conference*, Austin, TX.
- Olson, G., Kalir, J., & **Johnson, H. L.** (2018, April). Desmos techtivities for the college algebra classroom. *2018 Meeting of the Rocky Mountain Section of the Mathematical Association of America*, Pueblo, CO.

Coughlin, J. P., **Johnson, H. L.**, & Mays, D. C. (2018, March). Genetic decomposition: How do students learn to turn concepts into relationships? *Zone IV Meeting of the American Society for Engineering Education*, Boulder, CO.

Johnson, H.L., Kalir, R., Olson, G.A., Sutton, J. (2018, January). Implementing activities to promote students' covariational reasoning in college algebra. MAA/NSF Poster Session. Joint Math Meetings. San Diego, CA.

2017 **Johnson, H. L.** (2017, April). Didn't you learn that in high school? Why students struggle with rate and function, and how a covariation approach can help. *2017 Meeting of the Rocky Mountain Section of the Mathematical Association of America*, Pueblo, CO.

Johnson, H. L. & Tzur, R. (2017, April). Adapting Instruction to students' mathematical thinking: 5 practices of student adaptive pedagogy. *2017 Meeting of the Rocky Mountain Section of the Mathematical Association of America*, Pueblo, CO.

Johnson, H. L., Hornbein, P., & Bryson, D. (2017, April). Designing online playgrounds for learning mathematics. *National Council of Teachers of Mathematics' 95th Annual Meeting*, San Antonio, TX.

Johnson, H. L., Wang X., Tzur, R., & Sutton, J. (2017, April). Developing written, prompt-sensitive measures of multiplicative reasoning. *National Council of Teachers of Mathematics' Annual Research Meeting*, San Antonio, TX.

Sutton, J., **Johnson, H. L.**, & Tzur, R. (2017, April). Changing instructional practice—Permission isn't enough—Teachers need adaptive pedagogy to support student learning. *Annual Meeting of the National Council of Supervisors of Mathematics*, San Antonio, TX.

2016 Dunlap, J. C., Verma, G., & **Johnson, H. L.** (2016, October). The Presence+Experience framework: Supporting the purposeful design of presence in online courses. *Association for Educational Communications and Technology International Convention*, Las Vegas, NV.

Hornbein, P., & Azeem, S., & **Johnson, H. L.** (2016, September). Investigating function with a Ferris wheel. *Annual Meeting of the Colorado Council of Teachers of Mathematics*, Denver, CO.

Johnson, H. L. (2016, July). Designing technology-rich tasks to foster secondary students' covariational reasoning. *13th International Congress on Mathematical Education*, Hamburg, Germany.

Johnson, H. L., McClintock, E., & Hornbein, P. (2016, April). Ferris wheels and filling bottles: Investigating a student's transfer. *National Council of Teachers of Mathematics' Annual Research Meeting*, San Francisco, CA.

INVITED PRESENTATIONS (Since 2016)

2020 **Johnson, H. L.** (2020, September). ITsCRITiCAL: An intervention to promote students'

reasoning and address power dynamics in college algebra. *Texas State Mathematics Colloquium*. San Marcos, TX. (Presentation given via Zoom). \$200 honorarium.

Johnson, H. L. & Tsinnajinnie, B. (2020, October). Navigating a mathematics education collaboration across institutions. *University of Northern Colorado Mathematics Department Seminar*. Greeley, CO. (Presentation given via Zoom). \$100 honorarium.

2019 **Johnson, H. L.** (2019, June). Opportunities for reasoning impact students' math attitudes and course performance. *Annual Conference of the Maine Center for Research in STEM Education (RISE)*. Orono, ME.

2017 **Johnson, H. L.** (2017, December). Promote students' smooth covariational reasoning. *Mathematics Education Colloquium*. Tempe, AZ: Arizona State University. \$200 honorarium.

Johnson, H. L. (2017, November). Networking theories to design activities to promote students' covariational reasoning. *Universiteit Utrecht Freudenthal Institute Research Meeting*, Utrecht, Netherlands.

Johnson, H. L. (2017, October). Task design to promote students' covariational reasoning: A multi-theoretic approach. *Universität Bremen Mathematisches Kolloquium*. Bremen, Germany. €200 honorarium.

Johnson, H. L. (2017, September). Networking theories to design dynamic computer environments to foster students' quantitative and covariational reasoning. *Mathematics Education Research Colloquium*, Linköping, Sweden: Linköping University.

Harding, J., **Johnson, H. L.**, & Kitchen, R. (2017, April). K-8 math specialist panel discussion. *2017 Meeting of the Rocky Mountain Section of the Mathematical Association of America*, Pueblo, CO.

2016 Pape, S., Munter, C., Beckmann, S., Leatham, K. R., Silver, E. A., **Johnson, H. L.**, Dixon, J. K., Boston, M. D., Arbaugh, F., & Kastberg, S. (2016, April). Graduate student, junior faculty, and researcher mentoring session. *Invited Mentoring Session for the National Council of Teachers of Mathematics' Annual Research Conference*, San Francisco, CA.

SEMINARS & WORKSHOPS PRESENTED (Since 2016)

2017 **Johnson, H. L.** (2017, October). Task design in mathematics education: Development, navigation, iteration. *Doctoral Student Seminar, Universität Bremen Mathematisches Kolloquium*. Bremen, Germany.

Johnson, H. L. (2017, September). Quantity, covariation, and images of change. *Mathematics and Education Faculty Seminar*. Linköping, Sweden: Linköping University

2016 **Johnson, H. L.** (2016, April). Didn't you learn that in high school? Why students struggle with rate and function, and how a covariation approach can help. *Critical Issues in Undergraduate Mathematics Education Seminar*, University of Colorado Denver.

Denver, CO.

Johnson, H. L. (2016, April). Making sense of change in a changing world. *School of Education and Human Development Assistant Professor Lecture Series*. University of Colorado Denver, Denver, CO.

COURSES

PROGRAMS/CERTIFICATES

<u>CERTIFICATE</u>	<u>Level</u>	<u>Department</u>	<u>Institution</u>
Mathematical Content Knowledge for Teaching (Fully Online; 9 credits) <i>Developed, Taught, Revised</i>	Graduate	School of Education and Human Development	University of Colorado Denver
Middle School Mathematics Endorsement (Fully Online; 24 credits) <i>Developed (In progress)</i>	Graduate	School of Education and Human Development	University of Colorado Denver

TAUGHT (FACE TO FACE)

<u>Course</u>	<u>Level</u>	<u>Department</u>	<u>Institution</u>
Developmental Pathways in Students' Mathematical Thinking, MTED 5060/7060, <i>Revised</i>	Graduate	School of Education and Human Development	University of Colorado Denver
Mathematics for Elementary Teachers, UEDU 5400/MATH 3040	Graduate/ Undergraduate	School of Education and Human Development	University of Colorado Denver
Teaching Elementary Mathematics I, UEDU 5002/4002	Graduate/ Undergraduate	School of Education and Human Development	University of Colorado Denver
Teaching Elementary Mathematics II, UEDU 5003/4003	Graduate/ Undergraduate	School of Education and Human Development	University of Colorado Denver
Teaching Secondary Mathematics I, MTHED 411	Undergraduate	College of Education	The Pennsylvania State University

TAUGHT (BLENDED)

<u>Course</u>	<u>Level</u>	<u>Department</u>	<u>Institution</u>
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Critique of Mathematics Education Research, MTED 7050/5050, <i>Developed</i>	Graduate	School of Education and Human Development	University of Colorado Denver
Curriculum and Methods in Secondary Mathematics, UEDU 5300/4300, <i>Revised</i>	Graduate/ Undergraduate	School of Education and Human Development	University of Colorado Denver
Theories of Mathematical Learning, MTED 5030/7030, <i>Developed for a hybrid format</i>	Graduate	School of Education and Human Development	University of Colorado Denver

TAUGHT (FULLY ONLINE)

<u>Course</u>	<u>Level</u>	<u>Department</u>	<u>Institution</u>
Assessment and Equity in Secondary Mathematics, UEDU 5301/4301, <i>Developed</i>	Graduate/ Undergraduate	School of Education and Human Development	University of Colorado Denver
Expanding Conceptions of Algebra: Algebraic Reasoning Underlying K-12 Common Core Standards, MTED 5622, <i>Developed</i>	Graduate	School of Education and Human Development	University of Colorado Denver
Geometrical Ways of Reasoning Underlying K-12 Common Core Standards, MTED 5623, <i>Developed</i>	Graduate	School of Education and Human Development	University of Colorado Denver
A World of (Different) Numbers: Quantities & Operations Underlying k-12 Common Core Standards, MTED 5621, <i>Developed</i>	Graduate	School of Education and Human Development	University of Colorado Denver

SERVICE (Selected)

SERVICE TO COMMUNITY: BOARD SERVICE

<u>Membership</u>	<u>Date(s)</u>	<u>Board</u>	<u>Level (Regional, State, National, International)</u>
<i>Member</i>	06/2018 – Present	Colorado Council of Teachers of Mathematics Board of Directors	State

SERVICE TO PROFESSION: CONFERENCE PLANNING/LEADERSHIP

<u>Role</u>	<u>Date(s)</u>	<u>Conference/Meeting</u>
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- | | | |
|---|----------------|---|
| <i>Organizing Team Member: Topic Study Group #38: Task Design and Analysis</i> | 6/2018-7/2020 | Fourteenth International Congress on Mathematical Education; Shanghai, China |
| <i>Co-Leader: Thematic Working Group #17: Theoretical Perspectives and Approaches in Mathematics Education Research</i> | 11/2017-2/2019 | Eleventh Congress of the European Society for Research in Mathematics Education, Utrecht, Netherlands |

SERVICE TO PROFESSION: EDITORIAL SERVICE

Editor

- 2018-Present *Colorado Math Teacher Journal*, Colorado Council of Teachers of Mathematics.
<http://www.cctmath.org/cmtjournal/>

Associate Editor

- 2019-Present *Mathematical Thinking and Learning*, Taylor & Francis. 5-year Impact Factor: 1.09

Member of Editorial Board

- 2019-Present *Journal of Mathematical Behavior*, Elsevier.
2016-2018 *Mathematical Thinking and Learning*, Taylor & Francis. 5-year Impact Factor: 1.09

Member of Editorial Team

- 2015-2017 Mathematical Tasks and the Student, *ZDM Mathematics Education*, 2017 (6)

Co-Editor

- 2014-2017 Technology Tips Department, *Mathematics Teacher*, National Council of Teachers of Mathematics.

AWARDS/HONORS

External

- 4/2014 Linking Research and Practice Outstanding Publication Award – Mathematics Teacher. National Council of Teachers of Mathematics.
Publication: Johnson, H. L. (2013). Reasoning about quantities that change together. Mathematics Teacher, 106(9), 704-708.

- 7/2011 STaR Fellow
Service, Teaching, and Research for Early Career Mathematics Educators
National Science Foundation

- 3/2003 Presidential Award for Excellence in Mathematics Teaching (\$10,000)
National Science Foundation

Internal

- 2/2015 Faculty Award: Excellence in Teaching
School of Education and Human Development, University of Colorado Denver
- 4/2014 Faculty Award: Excellence in Research and Creative Activities
School of Education and Human Development, University of Colorado Denver