CURRICULUM VITAE Patricio G. Herbst

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Education

- Doctor of Philosophy (Mathematics Education), The University of Georgia, 1998. Dissertation: "What Works as Proof in the Mathematics Class" Director: Professor Jeremy Kilpatrick
- Master of Arts (Mathematics Education), The University of Georgia, 1995. Thesis: "The Construction of the Real Number System in Textbooks: A Contribution to the Analysis of Discursive Practices in Mathematics." Director: Professor Jeremy Kilpatrick.
- Profesor en Matemática y Cosmografía (Teacher of Mathematics and Cosmography) Facultad de Ciencias Exactas y Naturales y Agrimensura. Universidad Nacional del Nordeste, Argentina, 1987. Graduated with highest honors.

Employment

- Professor of Education and Mathematics. University of Michigan. May 2013 to present.
- Educational Studies Program Chair, School of Education, University of Michigan, September 2015 to August 2018.
- Associate Professor of Mathematics Education. School of Education. University of Michigan. September 2005 to 2013. (Since 2010 also Associate Professor of Mathematics, College of Literature, Science, and the Arts. University of Michigan.)
- Assistant Professor of Mathematics Education. School of Education, The University of Michigan. September 1999 to September 2005.
- Visiting Assistant Professor (postdoctoral position), Department of Counseling, Educational Psychology and Special Education (CEPSE) and Department of Mathematics. Michigan State University. August 1998- August 1999.
- Graduate Assistant. Department of Mathematics Education, University of Georgia, 1994-1998.
- Mathematics instructor and research fellow. National Council for Research of Argentina (CONICET), Department of Mathematics and Group of Mathematics, Science, and Technology Education, Facultad de Matemática, Astronomía, y Física, Universidad Nacional de Córdoba, Argentina,1990-1993.
- Mathematics instructor. Facultad de Ciencias Exactas y Naturales y Agrimensura, Universidad Nacional del Nordeste, Argentina, 1988-1990

• Mathematics Teacher (various secondary schools 8-12, 1987-1992)

Awards and Honors

- New Leadership Academy Fellow, 2018-2019. National Forum for Education and the Public Good, University of Michigan.
- Pattishall Award, 2009. School of Education. University of Michigan.
- National Science Foundation Early Career Award, 2002-2007
- Early Publication Award, SIG/RME, 2003.
- Antorchas Foundation Doctoral Fellowship, Argentina, 1997-1998.
- Del Jones Memorial Scholarship Award from the College of Education, University of Georgia, 1995-96.
- Fulbright Scholarship, 1993-1995.

Publications

<u>Books</u>

Herbst, P., Fujita, T., Halverscheid, S., and Weiss, M. (2017). *The learning and teaching of secondary school geometry: A modeling perspective*. New York: Routledge.

Herbst, P., Cheah, U., Jones, K., & Richard, P. (Eds., 2018). *International Perspectives* on the Teaching and Learning of Geometry in Secondary Schools. Cham, Switzerland: Springer.

Zazkis, R. & Herbst, P. (Eds, 2018). *Scripting approaches in mathematics education: Mathematical dialogues in research and practice*. New York: Springer.

Articles In Peer Reviewed Journals

Schwarts, G.[^], Herbst, P., Chazan, D., Buchbinder, O., Clark, L., Wieman, R., and Zahner, W. (2025). An analysis of mathematics teacher educators' subject-specific multimodal expertise when representing practice. *Journal of Mathematics Teacher Education*, *28*, 341–368. https://doi.org/10.1007/s10857-024-09658-y

Herbst, P., Brown, A., & Chazan, D. (2024). Practice-based teacher development in its mathematical context: Lessons and their representations in approximations of practice. *Journal of Educational Research in Mathematics*, *34*(3),753-791. https://doi.org/10.29275/jerm.2024.34.3.753.

Herbst, P., Brown, A. M., Ion, M.*, & Margolis, C.* (2024). Teaching geometry for secondary teachers: What are the tensions instructors need to manage? *International Journal of Research in Undergraduate Mathematics Education*, *10*,458–485. https://doi.org/10.1007/s40753-023-00216-0.

Brown, A., Savuran, R.[^], Herbst, P. & Jeon, S.* (2024). Enhancing Teacher Collaboration: Leveraging Technology for Knowledge Expansion Through Lesson Exchange and Annotation. *Journal of Technology and Teacher Education*, *32*(3), 317-346.

Jeon, S.*, Herbst, P., & Brown, A. (2024). Facilitating demonstration and simulation in practice-based professional development. *Journal of Educational Research in Mathematics*, *34*(3), 733-752.

Ko, I.[^], Herbst, P., and Shultz, M.* (2024). Comparing how college mathematics instructors and high-school teachers recognize professional obligations of mathematics teaching

when making instructional decisions. *Journal of Mathematics Teacher Education*, 27,1055–1082. <u>https://doi.org/10.1007/s10857-023-09595-2</u>

Ko, I.[^], Mesa, V., Duranczyk, I., Herbst, P., Kohli, N., Ström, A., & Watkins, L. (2024). Understanding the characteristics of mathematical content knowledge for teaching algebra in high schools and community colleges. *International Journal of Mathematical Education in Science and* Technology 55(3), 590-614, DOI: <u>https://doi.org/10.1080/0020739x.2021.2006348</u>

Herbst, P., Brown, A. M., Chazan, D., Boileau, N.¹, & Stevens, I.⁽²⁰²³⁾. Framing, responsiveness, serviceability, and normativity: Categories of perception teachers use to relate to students' mathematical work in problem-based lessons. *School Science and Mathematics*, *123*(7), 398-413. https://doi.org/10.1111/ssm.12600

Brown, A., Bardelli, E.*², Herbst, P., & Dimmel, J.⁽²⁰²³⁾. The role of emotions in simulations of teaching practice. *Implementation and Replication Studies in Mathematics Education*, *3*(2), 243-274. <u>https://doi.org/10.1163/26670127-bja10013</u>

Brown, A. & Herbst, P. (2023) On designing better practice-based professional development: Using "failure" to innovate. *Journal of Mathematics Teacher Education, 26*, 581–605. <u>https://doi.org/10.1007/s10857-023-09588-1</u>

Chazan, D. & Herbst, P. (2023). Extending use of instructional exchanges to teacher education. *Frontiers in Education*, 8, <u>doi: 10.3389/feduc.2023.1163396</u>

Brown, A., Herbst, P., & Hanby, K.* (2022). Using an analytic model to gauge the potential of innovative pedagogies of approximation in mathematics teacher education. *Mathematics Teacher Education and Development*, 24(2), 57–85. <u>https://mted.merga.net.au/index.php/mted/article/view/741</u>

Herbst, P., Shultz, M.*, Bardelli, E.*, Boileau, N.*, & Milewski, A. (2022). How can teaching simulations help us study at scale the tensions mathematics teachers have to manage when considering policy recommendations? *Educational Studies in Mathematics*, *110* (1), 1-21 <u>https://doi.org/10.1007/s10649-021-10118-0</u>

Erickson, A.[^], Herbst, P., Ko, I^{*}., & Dimmel, J[^]. (2021). When what routinely happens conflicts with what ought to be done: A scenario-based assessment of secondary mathematics teaching. *Research in Mathematics Education*. 23(2), 188-207, https://doi.org/10.1080/14794802.2020.1855600

Milewski, A., Erickson, A.,^ and Herbst, P. (2021). "It depends ...": Using ambiguities to better understand mathematics teachers' decision-making. *Canadian Journal of Mathematics and Science Education*, 21(1),123–144, <u>https://doi.org/10.1007/s42330-021-00141-x</u>

Herbst, P. and Chazan, D. (2020). Mathematics teaching has its own imperatives: Mathematical practice and the work of mathematics instruction. *ZDM-Mathematics Education*, *52*,1149–1162 <u>https://doi.org/10.1007/s11858-020-01157-7</u>

Herbst, P., Ko, I.[^], & Milewski, A. (2020). A heuristic approach to assess change in mathematical knowledge for teaching geometry after a practice-based professional learning

¹ ^ indicates co-authors who were postdoctoral mentees when involved in the published research.

² * indicates co-authors who were graduate students when involved in the published research.

^{**} Indicates an undergraduate student at the time of publication

intervention. *Research in Mathematics Education*, 22(2), 188-208 https://doi.org/10.1080/14794802.2019.1704851

Dimmel, J.* and Herbst, P. (2020). Presenting proofs in geometry classrooms: A study of what teachers expect from student mathematical communication. *Educational Studies in Mathematics*, 105(1), 71–89 <u>https://doi.org/10.1007/s10649-020-09975-</u>

Ko, I.* and Herbst, P. (2020). Subject matter knowledge of geometry needed in tasks of teaching: Relationship to prior geometry teaching experience. *Journal for Research in Mathematics Education*, *51*(5), 600-630. <u>https://doi.org/10.5951/jresematheduc-2020-0163</u>

Ko, I.[^] and Herbst, P. (2020). Are teachers amenable to increasing students' scope of work in doing proofs? Estimating teachers' decision-making using a diagnostic classification model. *Journal of Educational Research in Mathematics*, Special Issue, pp. 169-183. <u>https://doi.org/10.29275/jerm.2020.08.sp.1.169</u>

Aaron, W.^ and Herbst, P. (2019). The teacher's perspective on the separation between conjecturing and proving in high school geometry classrooms. *Journal of Mathematics Teacher Education*, 22(3), 231-256. <u>https://doi.org/10.1007/s10857-017-9392-0</u>.

Shultz, M*., Herbst, P., & Schleppegrell, M. (2019). The expression of agency by graduate teaching assistants and professors in relation to their professional obligations. *Linguistics and Education*, *52*, 33-43. <u>https://doi.org/10.1016/j.linged.2019.05.006</u>

Herbst, P. (2018). Teoría y métodos para la investigación de la racionalidad de la práctica en la enseñanza de las matemáticas [Theory and methods for research on the practical rationality of mathematics teaching]. *Educación Matemática*, *30*(1), 11-47. https://doi.org/10.24844/em3001.01

Dimmel, J.* and Herbst, P. (2018). What details do teachers expect from students' proofs? A study of routines for checking proofs in geometry. *Journal for Research in Mathematics Education*, 49(3), 261-291. <u>https://doi.org/10.5951/jresematheduc.49.3.0261</u>

Erickson, A.[^] and Herbst, P. (2018). Will teachers create opportunities for discussion when teaching proof in a geometry classroom? *International Journal of Mathematics and Science Education*, *16*, 167–181. <u>https://doi.org/10.1007/s10763-016-9764-4</u>

Milewski, A., Herbst, P., Bardelli, E.,* and Hetrick, C.* (2018). The role of simulations for supporting professional growth: Teachers' engagement in virtual professional experimentation. *Journal of Technology and Teacher Education*, *26*(1), 103-126. <u>https://www.learntechlib.org/p/181094/</u>

Dimmel, J.* and Herbst, P. (2017). Secondary mathematics teachers' expectations of student communication practices when doing proofs in geometry. *Teaching and Teacher Education*, 68, 151-160. <u>https://doi.org/10.1016/j.tate.2017.08.018</u>

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Chieu, V. M. and Herbst, P. (2016). A study of the quality of interaction among participants in online animation-based conversations about mathematics teaching. *Teaching and Teacher Education*, *57*, 139-149. <u>https://doi.org/10.1016/j.tate.2016.03.010</u>

Ghousseini, H.* & Herbst, P. (2016). Pedagogies of practice and opportunities to learn about classroom mathematics discussions. *Journal of Mathematics Teacher Education*, 19(1), 79-103. https://doi.org/10.1007/s10857-014-9296-1

Herbst, P. and Chazan, D. (2015). Studying professional knowledge use in practice using multimedia scenarios delivered online. *International Journal of Research and Method in Education*, *38*(3), 272-287. <u>https://doi.org/10.1080/1743727x.2015.1025742</u>

Aaron, W.* and Herbst, P. (2015). Teachers' perceptions of students' mathematical work while making conjectures: An examination of teacher discussions of an animated geometry classroom scenario. *International Journal of STEM Education*, 2(10), 1-13. https://doi.org/10.1186/s40594-015-0021-0

Chieu, V. M., Kosko, K. W.,^ and Herbst, P. (2015). An analysis of evaluative comments in teachers' online discussions of representations of practice. *Journal of Teacher Education*, *66*(1), 35-50. <u>https://doi.org/10.1177/0022487114550203</u>

Dimmel, J.* and Herbst, P. (2015). The semiotic structure of geometry diagrams: How textbook diagrams convey meaning. *Journal for Research in Mathematics Education*, 46(2), 147-195. <u>https://doi.org/10.5951/jresematheduc.46.2.0147</u>

Weiss, M.* and Herbst, P. (2015). The role of theory-building and problem-solving in the secondary Geometry course. *Educational Studies in Mathematics*, 89(2), 205-229. https://doi.org/10.1007/s10649-015-9599-x

Herbst, P., Chieu, V., & Rougée, A.* (2014). Approximating the practice of mathematics teaching: What learning can web-based, multimedia storyboarding software enable? *Contemporary Issues in Technology and Teacher Education*, *14*(4). Retrieved from <u>http://www.citejournal.org/vol14/iss4/mathematics/article1.cfm</u>

Herbst, P. and Kosko, K.[^] (2014). Using representations of practice to elicit mathematics teachers' tacit knowledge of practice: A comparison of responses to animations and videos. *Journal of Mathematics Teacher Education*, *17*(6), 515-537. <u>https://doi.org/10.1007/s10857-013-9267-y</u>

Kosko, K.,^ Rougée, A.,* and Herbst, P. (2014). What actions do teachers envision when asked to facilitate mathematical argumentation in the classroom? *Mathematics Education Research Journal, 26*(3), 459-476. <u>https://doi.org/10.1007/s13394-013-0116-1</u>

González, G.* and Herbst, P. (2013). An oral proof in a geometry class: How linguistic tools can help map the content of a proof. *Cognition and Instruction*, *31(3)*, 271-313. https://doi.org/10.1080/07370008.2013.799166

Chen, C.* and Herbst, P. (2013). The interplay among gestures, discourse, and diagrams in students' geometrical reasoning. *Educational Studies in Mathematics*, 83(2), 285-307. https://doi.org/10.1007/s10649-012-9454-2

Herbst, P. & Chazan, D. (2012). On the instructional triangle and sources of justification for actions in mathematics teaching. *ZDM–Mathematics Education*, 44(5), 601-612. <u>https://doi.org/10.1007/s11858-012-0438-6</u>

Herbst, P. (2012). Las tareas matemáticas como instrumentos en la investigación de los fenómenos de gestión de la instrucción: un ejemplo en geometría [Mathematical tasks as instruments for research on the phenomena of instruction management: An example in

geometry]. Avances de Investigación en Educación Matemática, 1, 5-22. https://doi.org/10.35763/aiem.v1i1.2

Aaron, W.* and Herbst, P. (2012). Instructional identities of geometry students. *Journal of Mathematical Behavior*, *31*, 382–400. <u>https://doi.org/10.1016/j.jmathb.2012.04.001</u>

Herbst, P., Nachlieli, T.,^ and Chazan, D. (2011). Studying the practical rationality of mathematics teaching: What goes into "installing" a theorem in geometry? *Cognition and Instruction*, 29(2), 218-255. <u>https://doi.org/10.1080/07370008.2011.556833</u>

Herbst, P. and Chazan, D. (2011). On creating and using representations of mathematics teaching in research and teacher development: Introduction to this issue. *ZDM Mathematics Education* 43(1), 1–5. <u>https://doi.org/10.1007/s11858-011-0306-9</u>

Herbst, P., Chazan, D., Chen, C.,* Chieu, V.M., and Weiss, M. (2011). Using comicsbased representations of teaching, and technology, to bring practice to teacher education courses. *ZDM Mathematics Education*, 43(1), 91–103. <u>https://doi.org/10.1007/s11858-010-0290-5</u>

Chazan, D., Sela, H., and Herbst, P. (2012). Is the role of equations in the doing of word problems in school algebra changing? Initial indications from teacher study groups. *Cognition and Instruction*, 30(1), 1-38. https://doi.org/10.1080/07370008.2011.636593

Chazan, D. and Herbst, P. (2012). Animations of Classroom Interaction: Expanding the Boundaries of Video Records of Practice. *Teachers' College Record*, *114*(3), 1-34. https://doi.org/10.1177/016146811211400302

Cirillo, M. and Herbst, P. (2012). Moving Toward More Authentic Proof Practices in Geometry. *The Mathematics Educator*, *21(2)*, *11-33*. https://files.eric.ed.gov/fulltext/EJ961514.pdf

Kosko, K.[^] and Herbst, P. (2012). A deeper look at how teachers say what they say: A quantitative modality analysis of teacher-to-teacher talk. *Teaching and Teacher Education*, 28, 589-598. <u>https://doi.org/10.1016/j.tate.2011.11.010</u>

Chazan, D. and Herbst, P. (2011). Challenges of particularity and generality in depicting and discussing teaching. *For the Learning of Mathematics*, *31*(1), 9-13. <u>https://www.jstor.org/stable/41319545</u>

Chieu, V.M., Herbst, P., and Weiss, M.* (2011). Effect of an animated classroom story embedded in online discussion on helping mathematics teachers learn to notice. *Journal of the Learning Sciences* 20(4), 589-624. <u>https://doi.org/10.1080/10508406.2011.528324</u>

Chieu, V.M. and Herbst, P. (2011). Designing an intelligent teaching simulator for learning to teach by practicing in the practice of mathematics teaching. *ZDM Mathematics Education*, 43(1), 105–117. <u>https://doi.org/10.1007/s11858-010-0291-4</u> Actions

Mesa, V. and Herbst, P. (2011). Designing representations of trigonometry instruction to study the rationality of community college teaching. *ZDM–Mathematics Education*, 43(1), 41–52. <u>https://doi.org/10.1007/s11858-010-0300-7</u>

González, G.* and Herbst, P. (2009). Students' conceptions of congruency through the use of dynamic geometry software. *International Journal of Computers for Mathematical Learning 14*(2), 153-182. <u>ttps://doi.org/10.1007/s10758-009-9152-z</u>

Herbst, P. and Chazan, D. (2009). Methodologies for the study of instruction in mathematics classrooms. *Recherches en Didactique des Mathématiques, 29*(1), 11-32.

Weiss, M.,* Herbst, P., and Chen, C.* (2009). Teachers' perspectives on "authentic mathematics" and the two-column proof form. *Educational Studies in Mathematics*, 70 (3), 275-293. <u>https://doi.org/10.1007/s10649-008-9144-2</u>

Nachlieli, T.^ and Herbst, P. with González, G.* (2009). Seeing a colleague encourage a student to make an assumption while proving: What teachers put to play in casting an episode of geometry instruction. *Journal for Research in Mathematics Education, 40*(4), 427-459. https://doi.org/10.5951/jresematheduc.40.4.0427

Herbst, P. and Miyakawa, T.⁽²⁰⁰⁸⁾. When, how, and why prove theorems: A methodology to study the perspective of geometry teachers. *ZDM Mathematics Education*, 40(3), 469-486. <u>https://doi.org/10.1007/s11858-008-0082-3</u>

Herbst, P. (2006). Teaching geometry with problems: Negotiating instructional situations and mathematical tasks. *Journal for Research in Mathematics Education*, *37*, 313-347.

González, G.* and Herbst, P. (2006). Competing arguments for the geometry course: Why were American high school students supposed to study geometry in the twentieth century? *International Journal for the History of Mathematics Education*, 1(1), 7-33.

Herbst, P. and Brach, C.* (2006). Proving and 'doing proofs' in high school geometry classes: What is 'it' that is going on for students and how do they make sense of it? *Cognition and Instruction, 24*, 73-122. <u>https://doi.org/10.1207/s1532690xci2401_2</u>

Herbst, P. (2005). Knowing about "equal area" while proving a claim about equal areas. *Recherches en Didactique des Mathématiques*, 25, 11-56.

Herbst, P., González, G.,* and Macke, M. (2005). How can geometry students understand what it means to define in mathematics? *The Mathematics Educator*, *15*(2), 17-24. <u>https://files.eric.ed.gov/fulltext/EJ845849.pdf</u>

Herbst, P. (2004). Interactions with diagrams and the making of reasoned conjectures in geometry. *ZDM Mathematics Education*, *36*(5), 129-139. <u>https://doi.org/10.1007/bf02655665</u>

Herbst, P. (2003). Using novel tasks to teach mathematics: Three tensions affecting the work of the teacher. *American Educational Research Journal*, 40, 197-238. https://doi.org/10.3102/00028312040001197_

Herbst, P. and Chazan, D. (2003). Exploring the practical rationality of mathematics teaching through conversations about videotaped episodes: The case of engaging students in proving. *For the Learning of Mathematics*, 23(1), 2-14. <u>https://www.jstor.org/stable/40248404</u>

Herbst, P. (2002). Engaging students in proving: A double bind on the teacher. *Journal for Research in Mathematics Education*, 33, 176-203. <u>https://doi.org/10.2307/749724</u>

Herbst, P. (2002). Establishing a custom of proving in American school geometry: Evolution of the two-column proof in the early twentieth century. *Educational Studies in Mathematics*, *49*, 283-312. <u>https://doi.org/10.1023/a:1020264906740</u>

Herbst, P. (1999). On devolving a voice to the participants of the mathematics classroom culture: a methodological critique. *Educational Review*, *51*, 183-190. <u>https://doi.org/10.1080/00131919997614</u> Herbst, P. and Kilpatrick, J. (1999). Pour lire Brousseau. For the Learning of Mathematics, 19(1), 3-10. <u>https://www.jstor.org/stable/40248283</u>

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Articles in peer reviewed conference proceedings

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Herbst, P., Jeon, S.*, & Ko, I. (2024). Instructor-student interactions in geometry courses for secondary teachers: Results from a national survey. In Cook, S., Katz, B. & Moore-Russo D. (Eds.). *Proceedings of the 25th Annual Conference on Research in Undergraduate Mathematics Education* (pp. 162-169). University of Nebraska, Omaha.

Herbst, P., Jeon, S.*, & Brown, A. (2024). How do instructors describe students' mathematical work and opportunity to learn in geometry courses for teachers? In Kosko, K. W., Caniglia, J., Courtney, S., Zolfaghari, M., & Morris, G. A., (Eds.). *Proceedings of the forty-sixth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1078-1086). Kent State University.

Brown, A., Herbst, P., & Schwarts, G.⁽²⁰²⁴⁾. Gauging professional growth: Moving beyond binary assessment by examining teachers' practical arguments in simulations of practice. In Kosko, K. W., Caniglia, J., Courtney, S., Zolfaghari, M., & Morris, G. A., (Eds.). *Proceedings* of the forty-sixth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 1234-1243). Kent State University.

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In A. Gutiérrez, T. Lowrie, & F. Emprin (Eds.), *Proceedings of ICMI Study 26 Advances in Geometry Education* (pp. 69-76). INSPE de Reims, France. https://hal.science/hal-04577863v2

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Ake, B.*, Dimmel, J., & Herbst, P. (2023). Teachers' Reactions to Routine and Alternative Practices for Presenting Proofs: A Survey Experiment. *Proceedings of the forty-fifth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 370-379). University of Nevada, Reno.

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Conference papers

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Herbst, P., Ko, I.[^], & Brown, A. (2024, July). Assessing prospective teachers' growth in mathematical knowledge for teaching geometry. Presented at TSG 4.6, ICME 15 conference. Sydney, Australia.

Schwarts, G.[^], Herbst, P., & Brown, A. (2024, July). Designing virtual simulations to support mathematics teachers' approximations of problem-based instruction. Presented at TSG 3.17, ICME 15 conference, Sydney, Australia.

Herbst, P., Jeon, S.*, & Brown, A. (2024, April). How do geometry courses for teachers support learning to teach? Results from an instructor survey. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.

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Schwarts, G.[^], Herbst, P., Stevens, I.[^], & Milewski, A. (2023, April). Beyond correctness: What do teachers notice about student work produced in problem-based lessons? Paper presented at the Annual Meeting of AERA, Chicago, IL.

Hetrick, C.^, Herbst, P., Milewski, A., & Ion, M.* (2023, April). Contention and coalescence in mathematical knowledge: Undergraduate geometry instructors' cooperative design of student learning objectives. Paper presented at the Annual Meeting of AERA, Chicago, IL.

Herbst, P., Milewski, A., & Stevens, I.[^] (2022, April). The Evolution of StoryCircles: An Online Professional Learning Approach to Attend to Practice in Context. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

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Stevens, I.[^], Boileau, N.*, Bridges, S.*, Milewski, A., & Herbst, P. (2022, April). Timing as a Complexity in Teaching. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Herbst, P., Chazan, D., and Boileau, N.* (2021). Framing, normativity, and serviceability in teachers' decision making during lessons. Paper accepted for presentation at TSG 37, ICME 14. Shanghai, China, 2021, later withdrawn. Available at https://hdl.handle.net/2027.42/171072

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Ko, I.,^, Herbst, P., and Shultz, M* (2021, April). Comparing how college mathematics instructors and high-school teachers recognize professional obligations of mathematics teaching when making instructional decisions. Paper presented at the Annual Meeting of the American Educational Research Association, Online.

Bardelli, E.*, Ion, M.*, Ko, I.^, & Herbst, P. (2020, April). Who Benefits from Mathematics Courses for Teachers? An Analysis of MKT-G Growth During Geometry for Teachers Courses. Paper accepted to be presented at the Annual Meeting of AERA, San Francisco.

Boileau, N.*, Herbst, P., & Milewski, A. (2020, April). Framing Novel Tasks as Familiar: Some Reasons Why and a Resulting Tension. Paper accepted to be presented at the Annual Meeting of AERA, San Francisco.

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Ko, I.* and Herbst, P. (2019, April). Estimating Teachers' Decision Making in Doing Proofs Using a Diagnostic Classification Model. Paper presented at the Annual Meeting of AERA. Toronto, Canada.

Herbst, P. and Ko, I.* (2019, April). Reconsidering the Organization of Mathematical Knowledge for Teaching. Paper presented at the Annual Meeting of AERA. Toronto, Canada.

Shultz, M.,* Bardelli, E.,* Milewski, A., Boileau, N.,* and Herbst, P. (2019, April). What can we learn about the differences between experts and novices from a teaching simulation? Paper presented at the Annual Meeting of AERA. Toronto, Canada.

Herbst, P. (2019, March). Resemblance and Analogy across Mathematical Practices. Paper presented at the conference "Mathematics and practice," Rostock, Germany.

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Erickson, A., Boileau, N., Huisinga, M., and Herbst, P. (2017, April). Measuring Secondary Geometry Teachers' Relationships With an Instructional Norm. Paper presented at the Annual Meeting of AERA, San Antonio, TX.

Ko, I., and Herbst, P. (2017, April). Investigating the Dimensionality of the Instrument Measuring Teachers' Mathematical Knowledge for Teaching Secondary Geometry. Paper presented at the Annual Meeting of AERA, San Antonio, TX.

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Milewski, A., Hanby, K., and Herbst, P. (2016, April). If at First You Don't Succeed ...: Using "StoryCircles" to Provide Preservice Teachers Opportunities to Practice. Paper presented at the Annual Meeting of the American Educational Research Association, Washington DC.

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Hanby, K. & Herbst, P. (2015, April). What do elementary teachers notice about students' informal methods of early subtraction and how do they respond to those methods? Paper presented at the NCTM Research Conference, Boston.

Herbst, P., Aaron, W., and Erickson, A. (2013, April). How Preservice Teachers Respond to Representations of Practice: A Comparison of Animations and Video. Paper presented at the 2013 meeting of the American Educational Research Association, San Francisco. Deep Blue at the University of Michigan. <u>http://hdl.handle.net/2027.42/97424</u>

Herbst, P., Aaron, W., Dimmel, J., and Erickson, A. (2013, April). Expanding students' involvement in proof problems: Are geometry teachers willing to depart from the norm? Paper

presented at the 2013 meeting of the American Educational Research Association. Deep Blue at the University of Michigan. <u>http://hdl.handle.net/2027.42/97425</u>

Chieu, V. M., Aaron, W., and Herbst, P. (2013, April). Impact of Critical Events in an Animated Classroom Story on Teacher Learners' Online Comments. Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA. Deep Blue at the University of Michigan. <u>http://hdl.handle.net/2027.42/97551</u>

Ghousseini, H. and Herbst, P. (2013, April). Learning about leading classroom mathematics discussions in, from, and for practice. Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Kosko, K., Rougée, A., and Herbst, P. (2013, April). What Actions do Teachers Envision When Asked to Facilitate Mathematical Argumentation in the Classroom? Paper presented at the 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Herbst, P. and Kosko, K. (2012, April). Using Cases as Triggers for Teachers' Thinking about Practice: A Comparison of Responses to Animations and Videos. Paper presented at the 2012 Annual Meeting of the American Educational Research Association, Vancouver, BC, Canada.

Aaron, W., Mesa, V., and Herbst, P. (2012, February). Challenges and tools in the facilitation of combined professional development and research sessions: The case of community college trigonometry instructors. Paper presented at the 15th Annual Conference on Research on Undergraduate Mathematics Education, Portland, Oregon.

Herbst, P. and Dimmel, J. (2011, April). *Teaching geometry through problems and its demands of knowledge management*. Paper presented at the 2011 Annual Meeting of the American Educational Research Association. New Orleans, LA.

Herbst, P. (2011, April). *Categories of perception and categories of appreciation: An operationalization of those constructs for the study of teacher study group discourse using ideas from systemic functional linguistics.* Paper presented at the 2011 Research Presession of the Annual Meeting of the National Council of Teachers of Mathematics. Indianapolis, IN.

Herbst, P. (2010, April). *What practical rationality is*. Paper presented at the Research Presession of the Annual Meeting of the NCTM. San Diego, CA.

Mesa, V., & Herbst, P. (2011, February). *Using animations of teaching to probe the didactical contract in community college mathematics*. Paper presented at the 14th Annual Conference on Research on Undergraduate Mathematics Education, Portland, Oregon.

González, G. and Herbst, P. (2010, May). *On proving relationships between possible facts: What do geometry teacher consider as valuable?* Paper presented at the 2010 Annual Meeting of AERA, Denver, CO.

Weiss, M. and Herbst, P. (2010, May). *Geometry teachers' mathematical sensibility: The role of Theory-Building and Problem-Solving in the secondary Geometry course*. Paper presented at the 2010 Annual Meeting of AERA, Denver, CO.

Chieu, V.M, Weiss, M., and Herbst, P. (2009, April). *A pilot study toward building webbased interactive rich-media virtual settings for teacher preparation and development*. Paper presented at the Annual Meeting of AERA, San Diego, CA. Mehrotra, M. and Herbst, P. (2009, April). *How and why geometry teachers respond to students' errors*. Paper presented at the Annual Meeting of AERA, San Diego, CA.

Miyakawa, T. & Herbst, P. (2008, July). Why some theorems are not proven in geometry class: dispositions and constraints. Presented at TSG 18, ICME 11, Mexico.

González, G. & Herbst, P. (2008, March). *Students' geometry toolbox: How do teachers manage students' prior knowledge when teaching with problems?* Paper presented at the American Educational Research Association annual meeting in New York City, New York.

González, G. & Herbst, P. (2008, March). *How teachers of geometry use diagrams as repository of the collective memory of a class*. Paper presented at the American Educational Research Association annual meeting in New York City, New York.

Aaron, W. and Herbst, P. (2007, April). *The Use of Animated Sketches in Constructing Narratives of Geometry Teaching*. Paper presented at the annual meeting of AERA. Chicago.

Chae, J., González, G. and Herbst, P. (2007, April). *Considering Alternatives in Teaching Geometry: What Expert Teachers Reported Learning about their Practice*. Paper presented at the annual meeting of AERA. Chicago.

González, G. and Herbst, P. (2007, April). *Mathematical tasks and the collective memory: The work of the teacher*. Paper presented at the annual meeting of AERA. Chicago.

González, G. and Herbst, P. (2007, April). *Revealing Students' Conceptions of Congruency through the Use of Dynamic Geometry: Affordances and Constraints of Artifacts in a Geometry Class.* Paper presented at the annual meeting of AERA. Chicago.

Herbst, P. and Nachlieli, T. (2007, April). *Studying the practical rationality of mathematics teaching: What goes into "installing" a theorem in geometry?* Paper presented at the annual meeting of AERA. Chicago.

Weiss, M. and Herbst, P. (2007, April). "Every single little proof they do, you could call it a theorem": Translation between abstract concepts and concrete objects in the Geometry classroom. Paper presented at the annual meeting of AERA. Chicago.

Nachlieli, T., González, G., and Herbst, P. (2006, April). *What do they call the episode? - Teachers' casting of an episode in which students engage in proving*. Annual Meeting of AERA, San Francisco.

Weiss, M., Chen, C. and Herbst, P. (2006, April). *Teachers' Perspectives on Mathematical Proof and the Two-Column Form*. Annual Meeting of AERA, San Francisco.

Chen, C. and Herbst, P. (2005, August). *The descriptive mode of interaction with diagrams in proving triangles congruent*. Paper presented at the 3rd East Asia Research Conference in Mathematics Education.

Herbst, P. (2004, September). *Conceptualizing and proving*. Paper presented at the Proof Collaborative Conference. September 16, Providence, Rhode Island.

Gonzalez, G. and Herbst, P. (2004). *Competing Discourses That Define The Geometry Course: What Was New In The Twentieth Century?* Paper presented at the Working Group on Geometry, 10th International Conference in Mathematics Education, Copenhagen, Denmark.

Herbst, P. and Brach, C. (2004). *Proving and proof in high school geometry: What is 'it' that is going on for students and how do they make sense of it?* Paper presented at the Annual Meeting of the American Educational Research Association. San Diego, CA.

Silver, E. and Herbst, P. (2004). '*Theory' in mathematics education scholarship*. Paper presented at the Research Presession of the 2004 Annual Meeting of the National Council of Teachers of Mathematics.

Herbst, P. (2003, April). *Triangles of Equal Area as a Proof Generated Concept*. Paper presented at the Research Pre-session of the 81st Annual Meeting of the National Council of Teachers of Mathematics, San Antonio, TX.

Herbst, P. (2002, April). Using tasks to develop new knowledge in a geometry classroom: Tensions that underlie the work of the teacher. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.

Herbst, P. (2001, April). *Managing the production of arguments about area—The work of the teacher*. Paper presented at the Annual Meeting of the American Educational Research Association, Seattle.

Herbst, P. and Wall, E. (2000, April). *Mathematics teaching as work: The use of metaphors in conceptualizing mathematics teaching as an object of study.* Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.

Herbst, P. (1999, August). *Prouver et enseigner la demonstration dans la classe de mathématiques aux Etats-Unis.* [Proving and teaching proof in school mathematics in the United States]. Paper presented at the 10th Summer School in Didactique of Mathematics, Houlgate, France. Available at the repository of the *International Newsletter on the Teaching and Learning of Mathematical Proof* (November 2000, <u>http://www-didactique.imag.fr/preuve/</u>)

Herbst, P. (1999, April). What Do the Practices Associated With Two-Column Proofs Say About the Possibilities of Argumentation?—The role of the teacher. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal. Available at the repository of the *International Newsletter on the Teaching and Learning of Mathematical Proof.*

Papers In Press, in Review, in Revision

Herbst, P. (in press). A descriptive theory of mathematics teaching: What can the theory of practical rationality say about the improvement of mathematics instruction. Text of plenary talk to be printed with proceedings of the 9th EARCOME (East Asia Research Conference in Mathematics Education, Korea).

Herbst, P. (in press). Editorial: Five years of editing JRME: What we have published between 2021 and 2025. In press at *Journal for Research in Mathematics Education*.

Herbst, P., Chazan, D., Brown, A., & Kosko, K. (in press). The professional obligations of mathematics teaching: How measurement and theoretical progress work hand in hand. Paper presented at CERME 14, Bolzano-Bozen, in press at HaL.

Herbst, P. (in press). Editorial: The Journal as part of the infrastructure of the field: Learning from what JRME reviews. *Journal for Research in Mathematics Education*, *56* (3).

Herbst, P. (accepted). Improving national capacity for geometry instruction: The formation and development of a faculty online learning community. To appear in Brown, A., Herbst, P., Miller, N., Pyzdrowski, L., & Reynolds, B. (Eds), *The GeT Course: Resources and*

Objectives for the Geometry Courses for Teachers. Target Mathematical Association of America.

Herbst, P., Jeon, S., Schwarts, G., Savuran, Y., & Brown, A. (in press). Tracking teachers' learning to select student work for classroom discussion in a simulation. Accepted for publication in the Proceedings of the International PME Conference PME 48, Santiago, Chile.

Herbst, P., Ko, I.[^], & Brown, A. (in preparation). Assessing prospective teachers' growth in mathematical knowledge for teaching geometry. To be submitted to *American Educational Research Journal*.

Brown, A. and Herbst, P. (invited to revise after review). Working collectively to design online teacher education curriculum: How do teacher educators manage to do it? *Digital Experiences in Mathematics Education*.

Brown, A., Herbst, P., Miller, N., Pyzdrowski, L., & Reynolds, B. (Eds., in review), The GeT course: Resources and objectives for the geometry courses for teachers. Submitted to the Mathematical Association of America Notes collection.

Brown, A., Savuran, R.[^], Chen, Q.^{*}, Jeon, S.^{*}, & Herbst, P. (in review). Supporting secondary mathematics teachers to manage discussionsL A design-based approach to professional development. Submitted to the PMENA 2025 conference, Penn State University.

Chazan, D. & Herbst, P. (in press). Illustrating the importance of designing semiotic infrastructures for mathematics teaching and mathematics teacher education. Plenary paper submitted to the 15th International Conference on Mathematical Education (ICME-15), Sydney, Australia.

Hanby, K. & Herbst, P. (in revision). Teachers' formative feedback of early addition and subtraction and the role that knowledge of a learning trajectory can play.

Jeon, S.*, Savuran, R.^, Brown, A., & Herbst, P. (in review). Lesson as an argument: Mapping how secondary mathematics teachers reason through instructional design. Submitted to the 2025 PMENA conference.

Schwarts, G.[^], Herbst, P., & Brown, A. (accepted pending revisions). "I don't understand the purpose of this experience": Tensions associated with collaborative, process-oriented professional learning for mathematics teachers. *Mathematics Teacher Education and Development*.

Schwarts, G.[^], Herbst, P., & Brown, A. (In press, online first). Harnessing asynchronous digital simulations of problem-based lessons to support mathematics teachers' professional development: A design-based research approach. In press at *International Journal of Mathematics and Science Education*. https://doi.org/10.1007/s10763-024-10514-x

Software

Herbst, P., Lavu, S., & Ko, I. (2023, December). GRIP Database. Database application.

Herbst, P., Chazan, D., & Lavu, S. (2020, November). *LessonDepict*. Web-based collaborative software tool for the creation of storyboards and storyboard maps. Disclosed to the Office of Technology Transfer, University of Michigan. www.lessondepict.org

Herbst, P., Chazan, D., & Lavu, S. (2019, March). *Anotemos*. Web-based collaborative software tool for the annotation of video. Disclosed to the Office of Technology Transfer, University of

Michigan. www.anotemos.com

Presentations

Invited Talks

Herbst, P. (2025, July). A descriptive theory of mathematics teaching: What can the theory of practical rationality say about the improvement of instruction? Plenary talk at the 9th EARCOME (East Asia Research Conference in Mathematics Education), Seoul, Korea.

Herbst, P. (2025, July). Brousseau's actual and possible influence on anglophone research in mathematics education. Plenary talk at the Colloque Brousseau, Bordeaux, France.

Herbst, P. (2025, March). Collaboration or change: Finding a sustainable stride. Closing plenary at the annual meeting of the Conversations among Colleagues conference of the Michigan Association of Mathematics Teacher Educators. Kalamazoo, MI.

Herbst, P. (2024, November). Una teoría descriptiva de la enseñanza de las matemáticas: ¿Qué puede decir sobre el mejoramiento de la instrucción en matemáticas?[A descriptive theory of mathematics teaching: What can it say about improving mathematics instruction] Plenary lecture at the XI Taller internacional Tendencias en la Educación Matemática basada en la investigación (TEMBI 11). Puebla, Mexico.

Herbst, P. (2024, April). Research on teaching knowledge in geometry: The case of proof in the United States. Plenary lecture at ICMI Study 26, Advances in geometry teaching and learning. Reims, France.

Herbst, P. (2023, July). Géneros y registros en la escritura científica en educación matemática [Genres and registers in scholarly writing in mathematics education]. Plenary talk at the Summer School for researchers organized by the SPIEM (Portuguese Society for Research in Mathematics Education) and SEIEM (Spanish Society for Research in Mathematics Education). Bragança, Portugal.

Herbst, P. (2022, September). La racionalidad práctica y el conocimiento matemático de les enseñantes. Plenary talk at the X EDIMAT conference. Universidad de San Martín, Buenos Aires, Argentina.

Herbst, P. (2021, October). Las lecciones como contenedores del conocimiento matemático de los enseñantes [Lessons as containers of teachers' mathematical knowledge]. Plenary at the Segundas Jornadas de Práctica Profesional Docente en Profesorados Universitarios en Matemática. Rosario, Argentina.

Herbst, P. (2019, December). How can we account for the decisions mathematics teachers make in instruction? Plenary at the Korean Society for Mathematics Education Conference, Ajou University, Korea.

Herbst, P. (2018, February). On mathematics textbook writing as storytelling. Invited response to plenary talk by Scott Baldridge. Research Council on Mathematics Learning Conference, Baton Rouge, LA.

Herbst, P. (2017, November). A modeling approach in the teaching of secondary geometry: What difficulties does it present to the teacher? Invited talk at the Problem Solving in Patagonia Conference, University of Magallanes, Punta Arenas, Chile.

Herbst, P. (2017, June). A modeling approach in the teaching of secondary geometry: What difficulties does it present to the teacher? Invited talk at the First International Week, University of Vechta, Germany.

Herbst, P. (2016, July). How Theory-Building Research on Instruction can Support Instructional Improvement: Toward a Modeling Perspective in Secondary Geometry. Keynote address at the 39th conference of the Mathematics Education Research Group of Australasia, Adelaide, Australia. (Available in ERIC ED572403)

Herbst, P. (2015, September). Teorías y métodos para la investigación de la racionalidad de la práctica en la enseñanza de las matemáticas. Plenary at the 3rd International doctoral colloquium in mathematics education. Mexico City, CINVESTAV.

Herbst, P. (2014, May). Scenario-based assessments and the Standards for Mathematical Practice. Invited talk at the Annual Meeting of the Michigan Section of the Mathematical Association of America and AMATYC. Flint, Michigan.

Herbst, P. (2013, January). Thought Experiments on Mathematics Teaching: How animated cartoons can help broker conversations about practice. Weizmann Institute of Science, Rehovot, Israel.

Herbst, P. (2013, April). The many functions of proof in high school mathematics. Invited presentation at the Research on Proof Strand, Annual Meeting of the National Council of Teachers of Mathematics (NCTM), Denver, CO.

Herbst, P. (2010, October). Practical rationality and the justification of actions in mathematics teaching. Invited plenary talk at the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education. Columbus, Ohio.

Herbst, P. (2010, February). Researching the practical rationality of mathematics teaching. Invited plenary lecture at the Annual Meeting of the Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education (RUME). Raleigh, NC.

Herbst, P. (2009, March). What "doing mathematics" could look like in high school. Invited plenary lecture. Conversations among Colleagues conference, Dearborn, MI.

Assude, T., Boero, P., Herbst, P., Lerman, S., and Radford, L. (2008, July). *The Notions and Roles of Theory in Mathematics Education Research*. Invited survey team presentation at the ICME 11th, Monterrey, Mexico.

Herbst, P. (2007, November). *The Roles of Theory in Mathematics Education Scholarship: How We Make Use of and Build Theory*. Invited plenary at the conference "Justification of findings in mathematics and science education research, with particular regard to the role of theory in such justification" organized by the National Danish Graduate School of Mathematics and Science Education (NADIFO) and the Nordic Graduate School of Mathematics Education (NoGSME). Nyborg, Denmark.

Herbst, P. and Chazan, D. (2006, March). Active Representations of Mathematics and Its Teaching. Invited plenary talk. Conversations among Colleagues conference, Ann Arbor, MI.

Herbst, P. (2004, July) *Proof, proving, and the work of teachers and students in classrooms*. Invited regular talk. 10th International Conference in Mathematics Education, Copenhagen, Denmark.

I've given invited colloquia at Université de Paris Sorbonne (France), East China Normal University (China), Instituto Pedagógico Nacional (Mexico), Universidad Nacional del Nordeste (Argentina), Syracuse University, Mofet Institute (Tel Aviv, Israel), Universidad Antonio Nariño (Bogotá, Colombia), University of Arizona, Arizona State University, Boston College, Texas State University, University of Bremen (Germany), University of Delaware, Educational Development Center (EDC), University of Georgia, University Joseph Fourier (Grenoble I, France), University of Haifa (Israel), University of Maryland, University of Michigan, Michigan State University, Portland State University, Sun-Yat Sen University (Taiwan), University of Utah, Virginia Technological University, Western Michigan University.

Selected other presentations (listed only those not listed as papers)

Herbst, P. & Ko, I. (2019, April). Reconsidering the Organization of Mathematical Knowledge for Teaching. Paper presented at the *Annual Meeting of the American Educational Research Association*, Toronto, Canada.

Herbst, P., Boileau, N., and Ko, I. (2017, April). Understanding the Rationality of Mathematics Teaching Using Multimedia Questionnaires: The ThEMaT Online study. Presentation at the Research conference of the National Council of Teachers of Mathematics (NCTM), San Antonio, TX.

Herbst, P. (2014, April). Practical rationality and beliefs. Symposium presentation at the Research Conference of the National Council of Teachers of Mathematics (NCTM), New Orleans, LA.

Herbst, P., Chazan, D., Aaron, W., Buchbinder, O., Dimmel, J., Erickson, A., and Kosko, K. (2013, April). Methods to study decisions in mathematics teaching. Symposium presentation at the Research Presession of the Annual Meeting of the National Council of Teachers of Mathematics (NCTM), Denver, CO.

Herbst, P. (2013, April). Depicting classroom scenarios to facilitate discussions about mathematical practice and its Standards. Presentation at the Annual Meeting of the National Council of Supervisors of Mathematics (NCSM), Denver, CO.

Herbst, P., Aaron, W., Chieu, V.M., and Moore-Russo, D. (2013, January). A Software Tool for Authoring Online Experiences in Mathematics Teacher Development. Presentation at the annual meeting of AMTE (Association of Mathematics Teacher Educators), Orlando, FL.

Cirillo, M. and Herbst, P. (2013, January). The role of rigor in mathematical proof. Presentation at the annual meeting of AMTE (Association of Mathematics Teacher Educators), Orlando, FL.

Herbst, P. and Chieu, V. M. (2012, July). Lesson*Sketch*: An online, practice-based environment for teacher development. Presentation at the SLOAN-C/MERLOT conference, July 27, Las Vegas, NV.

Herbst, P., Chazan, D., and Aaron, W. (2012, July). Using stories of *learning* and *teaching* in practice-based teacher education: The affordances of Lesson*Sketch*. Presentation at the conference Connecting Advances in Learning Research and Teacher Practice: A Conference about Teacher Education. Teachers' College, Columbia University, NYC, July 18.

Herbst, P. (2012, April). How do high school teachers relate to alterations in the practice of "doing proofs" in geometry? Presentation at a symposium organized by Michelle Cirillo at the NCTM Research Presession, Philadelphia, PA.

Herbst, P. (2012, April). Design Considerations for Representations of Teaching: The ThEMaT II Multimedia Surveys. Presentation at a symposium organized by Gloriana Gonzalez at the NCTM Research Presession, Philadelphia, PA.

Herbst, P. (2012, April). Lesson*Sketch*: An online, practice-based environment for learning to teach mathematics. Presentation at the Annual Meeting of NCTM, Philadelphia, PA.

Herbst, P. (2012, March). Animations and comics as representations of mathematical practice. Presentation at the Critical Issues in Mathematics Education 2012: Teacher education in view of the Common Core. Mathematical Sciences Research Institute (MSRI), Berkeley, CA.

Crespo, S., Aaron, W., Herbst, P., and Moore-Russo, D. (2012, February). Designing Practice-Based Mathematics Teacher Education Using Virtual and Interactive Technologies. Association of Mathematics Teacher Educators, Fort Worth, TX.

Herbst, P. (2011, April). Using an "impossible" construction problem to teach a geometric theorem. Presentation at the Annual Meeting of NCTM, Indianapolis, IN.

Herbst, P. (2011, April). Some Features of LessonSketch and How It Can Be Used with Preservice Teachers. Presentation at a symposium. NCTM Research Presession, Indianapolis, IN.

Herbst, P. and Chazan, D. (2011, March). Practical Rationality and its relationship with Mathematical Knowledge for Teaching. Presentation at a Conference in the Institute of Mathematics and Education, Tucson, AZ.

Herbst, P., Aaron, W., Chieu, V. M., Dimmel, J., Erickson, A., Kosko, K., and Rougee, A. (2011, February). Learning about the Work of Doing Mathematics from Geometric Problem Solving. Presentation at the Mathematics in Action – Conversations among Colleagues Joint Conference. Grand Valley State University.

Herbst, P. (2010, May). Representations of teaching and their roles in teacher education. Presentation on the occasion of receiving the Pattishall Award. School of Education, University of Michigan.

Herbst, P., Ball, D., Chazan, D., and Philipp, R. (2010, April). Practical rationality and mathematical knowledge for teaching. Symposium organized at the NCTM Research Presession, San Diego, CA.

Herbst, P. (2010, January). Assessing teacher thinking using online experiences with rich media. Presentation at a symposium. Association of Mathematics Teacher Educators, Irvine, CA.

Herbst, P. (2009, October). The many functions of proof in classroom mathematics. Invited address. Sun-Yat-Sen University, Kaohsiung, Taiwan.

Herbst, P. (2009, October). Researching the practical rationality of mathematics teaching. Invited address. Sun-Yat-Sen University, Kaohsiung, Taiwan.

Herbst, P., Aaron, W., González, G., & Weiss, M. (2009, April). Studying teachers' rationality using representations of teaching. Paper presented at the NCTM Research Presession, Washington, DC.

Herbst, P. (2009, April). Animations of classroom episodes: Visualizing opportunities to engage a class in proving. Presentation at the Annual Meeting of the National Council of Teachers of Mathematics, Washington, DC.

Herbst, P. (2008, October). Representations of teaching and their role in teacher learning. Presentation at the CKC Workshop, Laboratoire LIG, Grenoble, France.

Herbst, P. with T. Nachlieli and T. Miyakawa (2008, April). What a teacher needs to do to "install" a theorem: A study of practical rationality. Presentation at the NCTM Research Presession, Salt Lake City, UT.

Herbst, P., Chazan, D., and Nachlieli, T. (2007, April). *Toward an Experimental Paradigm for the Study of Mathematics Teaching: The Case of "Installing a Theorem."* Presented at a symposium at the annual meeting of AERA, Chicago.

Herbst, P. Hsu, H., Chen, C., González, G., and Jeppsen, A. (2007, April). Conceptions of *figure* in high school geometry instruction. Poster presented at the annual meeting of AERA. Chicago.

Herbst, P., Chazan, D., González, G., Weiss, M., Sandow, D., Nachlieli, T., Lueke, M., & Aaron, W. (2006, April). Creating and using representations of instruction to probe hypotheses. Presented at the NCTM Research Presession, St. Louis, MO.

Herbst, P. (2006, April). Managing the transaction between work and learning in the mathematics classroom. Intervention in a symposium on classroom management. Annual Meeting of AERA, San Francisco.

Herbst, P. (2005, April). *What can didactique offer to a teacher?* Intervention in the Symposium in honor of Guy Brousseau, ICMI Klein Medalist, at the NCTM Annual Meeting, Anaheim, CA.

Herbst, P. (2004). A discussion of the papers by Fang, Izsák et al., Langrall et al., and Le et al. Session 25.045, Division K. 2004 Annual Meeting of the American Educational Research Association. San Diego, CA.

Herbst, P. (2003, April). *Conceptualizing and Proving in Mathematics Classrooms*. A 150-minute symposium organized by Herbst at the Research Pre-session to the Annual Meeting of the National Council of Teachers of Mathematics in San Antonio, TX.

Herbst, P. (2003, April). Invited intervention as recent author in the session titled "Publishing In The Journal For Research In Mathematics Education" organized by the Editorial Panel of the Journal. Research Pre-session to the Annual Meeting of the National Council of Teachers of Mathematics in San Antonio, TX.

Herbst, P. (2002, May). Relating the Schism between "Doing Proofs" and "Coming to Know" to Teachers' Practical Reason. Poster presented at the NSF-REC Principal Investigator Annual Meeting, Arlington, VA.

Herbst, P. (2002, April). Didactique of Mathematics and mathematics education: Connecting two research traditions as we discuss Brousseau's Theory of Didactical Situations. Organizer of and presenter in this discussion group at the Research Presession for the NCTM 80th Annual Meeting. Las Vegas, NV. Herbst, P. & Macke, M. (2001, September). Dilemmas and Tensions in Collaborative Classroom Research. Poster presented at the NCTM Conference on Practitioner Research in Mathematics Education, Albuquerque, NM.

Herbst, P. (1999, August) Le future de la recherche sur la preuve. Participation in a round table. *Xéme Ecole d'Été de Didactique des Mathématiques*, Houlgate, France.

Herbst, P. (1999, April). Fostering argumentation in the mathematics class. Organizer of and presenter in this symposium at the Annual Meeting of the American Educational Research Association, Montreal.

Funded Research and Development Projects

Principal investigator in "Anotemos: Annotating mathematics media." Funding expected from the Bill and Melinda Gates Foundation. \$200,000. 2024-2025.

Co-principal investigator in "Examining an On-line, International Exchange Professional Development Program for High School Teachers" (P.I. Amanda M. Brown). Funded by the National Science Foundation, Directorate of Education and Human Resources (EHR), Division of Research on Learning (DRK12 program), DRL 2201087, 2022-2027, \$2,651,320.

Principal investigator in "Managing students' contributions to mathematical work in whole class discussions in high school: How do teachers decide what to do?" Funded by the James S. Mc Donnell Foundation, AWD No. 220020524, 2018-2024, \$2,065,318.

Principal investigator in "GeT Support: An online professional learning community to support the geometry course for teachers." Funded by the National Science Foundation, Directorate of Education and Human Resources (EHR), Division of Undergraduate Education (IUSE Program) DUE- 1725837, \$2,299,865, 2017-2024.

Principal investigator in "Embracing Mathematics, Assessment & Technology in High Schools through LessonSketch StoryCircles" contract with Macomb Intermediate School District, funded by the State of Michigan and the US Department of Education Math and Science Partnership Program for a grand total of \$370,800. APR # MI50804, 2015-2017

Principal investigator in "LessonSketch Online Modules for Implementing the Common Core Standards for Mathematical Practice" contracts with the districts of Gaylord, Dearborn, East Detroit, Orchard View, Charlotte, and Woodhaven for a grand total of \$23,840 funded by Michigan Department of Education. 2015-2016

Principal investigator in "SIMTEACH: What Can Practical Knowledge Modeled in a Teaching Simulator Contribute to Support Mathematics Teacher Learning?" Funded by the National Science Foundation, EHR, DRL-1420102, \$515,755. 2014-2018.

Co-principal investigator in "Developing Rich Media-based Materials for Practice-based Teacher Education" (P. I., D. Chazan). Funded by the National Science Foundation, DRL-1316241, \$2,650,526. Michigan Subcontract for \$1,146,373.00. 2013-2020.

Principal Investigator in Animation Production Agreement. Contract funded by NCTM to produce an animation, \$21,600. 2010-2011.

Principal Investigator in Supports for learning to manage classroom discussions: Exploring the role of practical rationality and mathematical knowledge for teaching. Funded by the National Science Foundation, DRL- 0918425, \$3,467,721, 2009-2018.

Principal Investigator in ThEMaT: Thought Experiments in Mathematics Teaching. Funded by the National Science Foundation, ESI-0353285, \$4,376,477, 2004-2011.

Principal Investigator in CAREER: Reasoning in high school geometry classrooms: Understanding the practical logic underlying the teacher's work. Funded by the National Science Foundation, REC-0133619, \$561,893, 2002-2009.

Principal Investigator Reasoning and proving in high school geometry—A study of teaching. Funded by the Office of the Vice President for Research. The University of Michigan. \$ 6,851. 2000-2001.

Service to the profession

International

Participant in Oxford-style debate on requiring that articles submitted to journals in mathematics education be required to address the UN position on sustainability. Argued for the negative. PME 46 conference, Haifa, Israel.

Chair, Topic Study Group on research on secondary mathematics instruction. ICME 14, Shanghai, China, 2020. Resigned after firming up the program due to schedule conflicts when the conference was rescheduled.

Curriculum evaluator, Ministry of Education of Colombia 2013-2014

Chair, Topic Study Group on the teaching and learning of geometry at the secondary level. ICME 13, Hamburg, Germany 2016

Member, Survey Team on Theory, ICME 12, Monterrey, Mexico 2012

University and School

Faculty Senate Communications Advisory Committee, 2023-2025 Ph.D. Steering Committee, Educational Studies, 2023-2025 Member of the Board of Directors of PLUMA (Professional Latinos of the University of Michigan), 2023-2025 Member, Search Committee on Applied Linguistics, 2022-2023 Educational Studies Program Chair, 2015-2018 Director of the GRIP Lab, School of Education, University of Michigan, 2001-present Principal, ScenarioSketch Team, Michigan I-CORPS 2013 Member, Graduate Affairs Committee 2013-2015 Member, Research Advisory Committee, 2008-2013 Member, Promotion and Tenure Committee, 2014-2015, 2010-2012 Lead Faculty for Secondary Mathematics, Teacher Education Program, University of Michigan, 1999-2015 Unit coordinator, EMST (Education in Mathematics, Science, and Technology), 2014-2015 Mathematics Education Search Committee Chair, 2014-2015 Member of the Mendez Commission on Information Technology

Local

Assistant Coach, MathCounts, Forsythe Middle School (2012-2014)

Head Coach, Math Counts, Forsythe Middle School (2006-2008)

Treasurer of the Board of Directors, Interfaith Hospitality Network at Alpha House, 2012-2014

Member of the Board of Directors, Interfaith Hospitality Network at Alpha House, 2011-2018

Reviewing and Editing

Editor in Chief, Journal for Research in Mathematics Education, 2019-2025

Member of the editorial team for GeT: The News! <u>https://www.gripumich.org/projects/get-a-pencil/</u>

Guest Editor, Journal of Technology and Teacher Education, 2018(1)

Guest Editor, ZDM Mathematics Education, 2011(1)

Guest Editor, Special Issue 29(1), 2009, on Methodologies for studying mathematics classrooms, *Recherches en Didactique des Mathématiques*

Program Chair, Division C Section 3 (Mathematics), 2009 AERA Annual Meeting, San Diego.

Strand Leader Geometry, PMENA 2012, PMENA 2013, PMENA 2018 conferences

Editorial Board Member, 2017-present, Revista de Educación Matemática, Argentina

Editorial Board Member, 2015-2018, Journal for Research in Mathematics Education

Editorial Board Member, 2006-2019. Educational Studies in Mathematics.

Editorial Board Member, 2003-present. Recherches en Didactique des Mathématiques.

Editorial Board Member, 2001-present. Journal of Mathematics Teacher Education.

Editorial Board Member, 2004-present. *International Newsletter on the Teaching and Learning of Mathematical Proof.*

Associate Editor of the International Newsletter on the Teaching and Learning of Mathematical Proof. 2000-2004.

Reviewer for grants submitted to the Spencer Foundation, National Science Foundation's Directorate of Education and Human Resources, the Social Sciences and Humanities Research Council of Canada, the Israel Science Foundation (ISF), and the National Research Foundation of South Africa.

Reviewer of grant proposals submitted to the Provost office, University of Michigan.

Reviewer of reappointment and promotion and tenure dossiers for higher education institutions. Various years and several institutions in the US, South Africa, and Lebanon.

Member of the National Selection Committee for the Presidential Award for Excellence in Mathematics and Science Teaching.

Reviewer for scholarly journals: Educational Assessment, Journal for Research in Mathematics Education, Cognition and Instruction, Journal of Mathematics Teacher Education, Educational Review, Recherches en Didactique des Mathématiques, Educational Psychologist,

Educational Studies in Mathematics, American Educational Research Journal, For the Learning of Mathematics, Research in Collegiate Mathematics Education, Journal of the Learning Sciences, Zentralblatt fur Didaktikk der Mathematikk (ZDM), Review of Educational Research, Mathematical Thinking and Learning, Yupana (Argentina), Revista Latinoamericana de Matemática Educativa (RELIME, México), Journal of Mathematical Behavior, Journal of Teacher Education, Learning and Individual Differences, Journal of Educational Psychology, Revista de Educación Matemática (Argentina).

Reviewer for annual meetings of AERA (Divisions C, K, and SIG/RME), PME, and PMENA, multiple years, since 1998. Member of the Editorial Board of Division C3 (2008-2010).

Translator of many articles into Castillian for their publication in the online Newsletter on Proof (<u>http://www-cabri.imag.fr/Preuve/</u>).

Offices in professional organizations

SIG/RME (Special Interest Group on Research in Mathematics Education), Steering committee member, 2003-2005

Workforce Education Initiative, Chair. School of Education, University of Michigan. 2018-2019

Membership in professional organizations

American Educational Research Association (AERA), Division C (Learning and Instruction), Division J (Education in the Professions), and SIG-RME (Special Interest Group for Research in Mathematics Education) National Council of Teachers of Mathematics (NCTM) Michigan Council of Teachers of Mathematics (MCTM) International Group for the Psychology of Mathematics Education (PME) and North American Chapter (PME-NA) Association of Mathematics Teacher Educators (AMTE) and Michigan Chapter (MI-AMTE) Association pour la Recherche en Didactique des Mathématiques, France (ARDM) PDK (Phi Delta Kappa) Mathematical Association of America (MAA) and SIGMAA-RUME American Mathematical Society (AMS) Heterodox Academy (HxA) and Michigan Chapter

Mentoring and advising

Postdoctoral fellows

Gil Schwarts (postdoctoral mentee, 2022-2024, currently at Weizmann Institute of Science, Israel)

Carolyn Hetrick (postdoctoral mentee, 2021-2023, currently at Seattle Public Schools)

Nicolas Boileau (postdoctoral mentee, 2021-2021, currently at the Thinkwell Foundation)

Irma Stevens (postdoctoral mentee, 2019-2022, currently at University of Rhode Island)

Inah Ko (postdoctoral mentee, 2019-2022, currently at University of Michigan Medical School)

Enes Akbuga (postdoctoral mentee, 2018-2019, currently at Drake University)

Ander Erickson (postdoctoral mentee, 2014-2016, currently at University of Washington Tacoma)

Justin Dimmel (postdoctoral mentee, 2014-2015, currently at University of Maine)

Amanda Milewski (postdoctoral mentee 2013-2015, currently at University of Michigan)

Yung-Chi (Jack) Lin (postdoctoral mentee, 2012-2013, currently at National Chiayi University, Taiwan)

Wendy Aaron (postdoctoral mentee, 2011-2012, currently at Lane Community College, Oregon)

Karl Kosko (postdoctoral mentee, 2010-2012, currently at Kent State University)

Takeshi Miyakawa (postdoctoral mentee, 2006-2009, currently at Waseda University, Japan)

Vu Minh Chieu (postdoctoral mentee, 2006-2009, currently at Amazon)

Talli Nachlieli (postdoctoral mentee, 2004-2006, currently at Levinski College, Israel)

Jeong-lim Chae (postdoctoral mentee, 2005-2006, currently at Sonoma State University)

Doctoral students (completed)

Saba Gerami (member of doctoral committee, defended May 2024, currently an assistant professor of mathematics at California Polytechnic San Luis Obispo)

Nicolas Boileau (advisor and dissertation chair, defended December 2020, currently a researcher at Thinkwell Research & Strategy)

Mollee Shultz (advisor and dissertation chair, defended April 2020, now Director of Data and Impact at Puget Sound Education Service District, Washington)

Inah Ko (advisor and dissertation chair, defended April 2019, now Research Scientist at University of Michigan Medical School)

Kristi Hanby (advisor and dissertation chair, defended December 2017, currently a Consultant at Wayne RESA)

Justin Dimmel (advisor and dissertation chair, defended December 2014, currently an associate professor at University of Maine)

Ander Erickson (advisor and dissertation chair, defended December 2014, currently an associate professor at University of Washington Tacoma)

Elaine Lande (member of dissertation committee, defended December 2014, currently a Lecturer at University of Michigan's Comprehensive Studies Program)

Chialing Chen (advisor and dissertation chair, defended December 2011)

Wendy Aaron (advisor and dissertation chair, defended November 2010, currently a mathematics instructor at Lane Community College, Oregon)

Hui-Yu (Angela) Hsu (member dissertation committee, defended July 2010, currently a professor in Taiwan)

Michael Weiss (dissertation chair, defended June 2009, currently a lecturer at University of Michigan Department of Mathematics)

Mark Hoover (member dissertation committee, defended April 2009, currently a research scientist at the University of Michigan School of Education)

** Indicates an undergraduate student at the time of publication

Gloriana González (advisor and dissertation chair, defended December 2008, currently a professor at University of Illinois at Urbana-Champaign)

Hala Ghousseini (member dissertation committee, defended December 2007, currently a professor at University of Wisconsin-Madison)

Maria Lizzette Hamlin (co-chair, defended May 2006)

Babette Marie Benken (member doctoral committee, defended October 2004, currently a professor at California State University Long Beach)

Doctoral students (current)

Qiuyu Chen (advisor, pre-candidate)

Soobin Jeon (advisor, pre-candidate)

Doctoral advisees (former)

The following students were advisees whom I mentored and coauthored with, though they did not finish their studies under my direction: Michael Ion (graduated), Emanuele Bardelli (graduated), Scott Bridges (left program before candidacy), Umut Gürsel (left program before candidacy), Annick Rougee (graduated), Rachel Snyder (graduated), Manu Mehrotra (left program before candidacy), Catherine Brach (left program).

Master students (interns)

Umut Gürsel (2017) Liangke Yang (2018) Jinxhi Zhou (2019) Matt Park (2019) Undergraduate students (UROP and independent studies) Xinzhu Chen (2013-2014) Maranda Discenna (2013-2015) Corin Cooney (2015-2016) Steven Katofiasc (2015-2016) Keith Chung (2015-2016) Yasmine Abushukur (2015-2016) Daniel Thompson (2016-2017) Lawrence Teng (2016-2017) Jason Vande Velde (2017-2018) Kirsten Birman (2018-2019) Andrew Spiteri (2020-2022) Michael Green (2020-2021) Megha Bairwal (2021-2024)

Rashmi Nair (2021-2022)

André Quimper-Osores (2022-2023)

Amirali Danae (2022-2023)

Adia Lee (2023-2024)

Doctoral Education Roles in other Universities

Doctoral committee member for Margarita Curiel Neri (Advisor: Claudia Acuña; CINVESTAV-IPN, México, defended April 2019)

Member of the doctoral faculty for the Doctorate in Science Education, University of Córdoba, Argentina (current).

Committee member in the doctoral dissertation by Arnon Avitzur (Advisor: Martin Simon; New York University, discontinued)

External evaluator of the doctoral dissertation by Ana Lage Ramírez (Advisor: Patrick Thompson; Arizona State University, defended August 2010).

External evaluator of the doctoral dissertation by Leong Yew Hoong (Advisor: Helen Chick; University of Melbourne, Australia, defended June 2008)

Opponent (external critic and defense examiner) in the dissertation by Johan Prytz (Advisor: Staffan Rodhe; University of Uppsala, Sweden, defended June 2007).

March 2025