

# AIM Collective: Research Outputs

## Conference Presentations

1. Douglas, H. (2023, March). Ready Set Count, Screening Early Number Skills. Presented at the Learning Disabilities Institute 14th Annual Conference, virtual.
2. Merkley, R. (2023, March). Implementing Universal Screening to Support All Learners. *Institut des troubles d'apprentissage (Learning difficulties institute)*. presented remotely
3. Yu, S., Douglas, H., LeFevre, J-A. (2023, June). Gender differences in number line performance for 7- and 8-year-old students. Presented at the annual meeting of the *Mathematical Cognition and Learning Society*, Loughborough, UK.
4. Yu, S., Douglas, H., LeFevre, J-A. (2023, June). Gender differences in number line performance for 7- and 8-year-old students. Presented at the annual meeting of the *Mathematical Cognition and Learning Society*, Loughborough, UK.
5. Rice, J., Douglas, H., Yu, S., Merkley, R., LeFevre, J. (2023, July) The Kids are Alright: Summer Learning Loss in Numeracy is Minimal. Poster presented at the annual meeting of the *Canadian Society for Brain Behaviour and Cognitive Science*, Guelph, Canada.
6. Kahwaji, L., Douglas, H., Rice, J., Yu, S., Merkley, R., LeFevre, J. (2023, July) What Foundational Numeracy Skills Predict Arithmetic Performance One Year Later in Grades 2-3: Data from the Provincial Numeracy Screening Assessment. Poster presented at the *Canadian Society for Brain Behaviour and Cognitive Science*, Guelph, Canada.
7. Kahwaji, L., Chitranshi, A., Merkley, R., LeFevre, J., Yu, S., Douglas, H. (2023, July). Connecting Cognitive Science and Education to Advance Assessment and Instruction in Mathematics: Sharing our Collective Voices. Presented at the annual meeting of the *McMaster Conference on Education and Cognition*, Hamilton, ON, Canada.
8. Douglas, H., & Youmans, S (2023, August). Laying a Solid Foundation in Early Numeracy. Presented at the *Canadian Early Mathematics Education Conference*, Kingston, ON.
9. Houle, J. (2023, August). The NyKK-5 Toolkit: Selecting Manipulatives to Support Early Numeracy Activities. Presented at the *Canadian Early Mathematics Education Conference*, Kingston, ON.
10. Houle, J., & Osana, H. (2023, September). NyKK-5: Educator-Research collaboration to support teachers' early numeracy practice in kindergarten. Fields Education Forum, Toronto.
11. Douglas, H., P., & Anthony, T. (2023, September). The development and implementation of the Early Math Assessment at School. Fields Education Forum, Toronto.
12. LeFevre, J.-A. (2023) September. Connecting to advance assessment and instruction in math education: The AIM Collective. Fields Education Forum, Toronto.
13. Orsini, A., Rice, J., Osana, H.P., Houle, J., & Lafay, A. (October, 2023). Simulating a pedagogy of enactment may work for some early numeracy teachers but not for others. *Psychology of Math Education*, North American Chapter, Reno, NV.
14. Douglas, H. & Yu, S. (2023, November). Assessment and Instruction in Mathematics (AIM): Building a strong foundation. Hands-on Workshop. *London Catholic District*

- School Board Professional Development Day*. London, ON
15. Douglas, H. (2023, November). Assessment and Instruction in Mathematics (AIM): Building a strong foundation. Keynote Speaker. *London Catholic District School Board Professional Development Day*. London, ON
  16. Youmans, A., Hawes, Z., Merkley, R., Gunning, S., Savelson, Z., Chisolm, L., Collins, M., Black, C., Godden, L., Montgomery, C., Tellos, A., & Lacelle, K. (2024, April 12). Co-constructing professional development: A framework for fostering educators' professional growth. [Conference Presentation]. Carleton Cognitive Science Graduate Conference, Ottawa, Ontario, Canada.
  17. Youmans, A., Douglas, H. (2024, May 3). Numeracy Screening and Intervention in the Primary Grades (K-3): Introducing the AIM Collective. Presented at the Ontario Association for Mathematics Education Annual Conference, Kingston, ON.
  18. Douglas, H., Houle, J., Anothony, T., Kozak, A. (2024, June). The AIM Collective: Bringing together researchers and educators to improve early math learning. Presented at the Canadian Society for the Study of Education, Montreal, QC.
  19. Yu, S., Douglas, H., Merkley, R., & LeFevre., J-A. (2024, June). Co-developmental Trajectories among Comparison, Ordering and Arithmetic. Talk presented at the annual meeting of the *Mathematical Cognition and Learning Society*, Washington, DC, USA.
  20. Yu, S., McDonald, J., Hawes, Z., Merkley, R., Youmans, A., & LeFevre., J-A. (2024, June). Canadian educators' beliefs, training, and practices in early math assessment and instruction. Poster presented at the annual meeting of the *Canadian Psychological Association*, Ottawa, ON, Canada.
  21. Kahwaji, L., Chitranshi, A., Gandhi, A., Hurley, S., LeFevre, J., Maloney, E., Skwarchuk, S-L., Young, M., Zhang, C., Merkley, R. (2024, June). Multiplying Student Success in Early Mathematics: Sharing Insights from Research-Practice Partnerships [Poster presentation]. Mathematical Cognition and Learning Society, Washington, D.C.
  22. Merkley, R., Douglas, H., \*Yu, S., LeFevre, J. (2024). The development and implementation of the Early Math Assessment @ School in Canadian Classrooms. Talk presented at the annual meeting of the *Mathematical Cognition and Learning Society*, Washington, DC, USA.
  23. Chitranshi, A., Yu, S., Douglas, H., Merkley, R., & LeFevre., J.A. (2024, June). *Unlocking the Equation: Exploring the Impact of Early Numerical Competency in Determining Future Mathematics Achievement* [Poster presentation]. The Canadian Society for Brain, Behaviour and Cognitive Science, Edmonton, Alberta, Canada.
  24. Houle, J., & Osana, H. P. (May 2023). *The AIM Collective: Building partnerships to support assessment and instruction in mathematics* [Plenary presentation]. The AIM Summit. Carleton University, ON.
  25. Osana, H. P. (May 2024). *Children's thinking about base-ten concepts: Implications for instruction* [Working group presentation]. The AIM Summit. Ottawa, ON, Canada.
  26. Houle, J., & Osana, H. P. (April 2025). *La trousse de numératie NyKK-5: Outiller les enseignants pour comprendre et interpréter les conversations mathématiques* [Webinar]. Organisation Mondiale pour l'Éducation Préscolaire-Canada (OMEP-Canada).
  27. Kathouda, Z., Orsini, A., Houle, J., & Osana, H. P. (April 2024). *Bridging mathematical foundations from kindergarten to first grade with the Numeracy Kit for Kindergarten 5-*

- Year-Olds*. Poster presented at the Center for Research in Human Development (CRDH) Annual Conference, Montreal, QC.
28. Douglas, H., & Hallett, D. (November 2024). *Early Math Learning and Assessment: EMA@School*. [Keynote speaker]. Council of Atlantic Ministers of Education and Training (CAMET) Annual Conference, St. Johns, NL.
  29. Anthony, T. (November 2024). *The MATmatics Intervention for Early Math Learning*. [Keynote speaker]. Council of Atlantic Ministers of Education and Training (CAMET) Annual Conference, St. Johns, NL.
  30. Merkley, R. (December 2024). *Translating science of learning into policy and practice: Pathways to implementation*. Annual Meeting of the UNESCO International Community of Practice - Global Alliance on the Science of Learning for Education. Paris, FR (presented virtually)
  31. Merkley, R. (April 2025). *The AIM Collective: Connecting Research and Practice in Early Math Education in Canada*. ENCoRE UK. Birkbeck, University of London, UK
  32. Kahwaji, L. (2025, April). Assessment and Instruction in Mathematics: Knowledge Mobilization Through Researcher–Educator Partnerships [Lightning Talk]. Mathematical Cognition and Learning Society Trainee Webinar.
  33. Yu, S. (2025, April). Collective Efforts between Researchers and Educators to Improve Assessment and Instruction in Mathematics [Lightning Talk]. Mathematical Cognition and Learning Society Trainee Webinar.
  34. Youmans, A., Douglas, H., & Creelman, R. (2025, May 9). Using Progressions to Deepen Math Teaching and Learning in K-8 Classrooms. Presented at the Ontario Association for Mathematics Education Annual Conference, Oshawa, ON.
  35. Douglas, H. & Kozak, A., (2025, May 9). Developing, Implementing and Evaluating an Evidence-based Intervention for Improving Foundational Numeracy Skills in Grade 1 Students. Presented at the Ontario Association for Mathematics Education Annual Conference, Oshawa, ON.
  36. O'Brien, S., Douglas, H., Merkley, R., LeFevre, J.-A., & Anthony, T. (2024). Does MATmatics Work? Impact of Early Numeracy Intervention on Students' Math Skills. *Carleton Undergraduate Journal of Science*, 3(1). <https://doi.org/10.22215/cujs.v3i1.4925>
  37. Amsden, A., Douglas, H., LeFevre, J.-A., & Mussio, C. (2024). Comparison of Measures of Mathematical Achievement: EMA@School and Star Math Assessment. *Carleton Undergraduate Journal of Science*, 3(1). <https://doi.org/10.22215/cujs.v3i1.4881>
  38. Merkley, R., Douglas, H. & LeFevre, J. (2025, January). Applied research supported by the AIM Collective. Invited presentation to the *Centre for Early Mathematical Learning*, Loughborough University.
  39. Chitranshi, A., LeFevre, J.-A., Merkley, R., Douglas, H., & Yu, S. (2025, July). Exploring profiles of early math achievement in Canadian students. Talk presented at the joint meeting between the Experimental Psychology Society and the Canadian Society for Brain, Behaviour and Cognitive Science, Dundee, Scotland, UK.
  40. Kahwaji, L., Yu, S., Douglas, H., Merkley, R., LeFevre, J. (2025, July). One and Done? Testing the Need for Repetition in Counting Tasks [Talk]. Canadian Society for Brain, Behaviour and Cognitive Science, Dundee, Scotland.
  41. Kahwaji, L., Yu, S., Douglas, H., Merkley, R., LeFevre, J. (2025, July). Assessment and Instruction in Mathematics: Knowledge Mobilization Through Researcher–Educator

- Partnerships [Lightning Talk]. Mathematical Cognition and Learning Society Trainee Webinar.
42. Katkhouda, Z., Rodrigues, M. L., Houle, J., Orsini, A., & Osana, H. P. (May 2025). *Exploring the long-term benefits of early numeracy to place-value learning in the first grade*. [Poster presentation]. Assessment and Instruction in Mathematics (AIM) 3rd Annual Summit, Montreal, Canada. Montreal, Canada.
  43. Macevicius, C., & Osana, H. P. (May 2025). *The diversity of visual representations of fractions in two Québec textbook series*. [Poster presentation]. Assessment and Instruction in Mathematics (AIM) 3rd Annual Summit, Montreal, Canada.
  44. Millar, M., Kahwaji, L., & Merkley, R. (May 2026). *Scrolling for Science: Children's Sharing in the TikTok Cookie Challenge*. [Poster Presentation]. Jean Piaget Society, Ottawa, Canada.
  45. Kahwaji, L., Marshall, L., Merkley, R., & LeFevre, J.-A. (April 2026). *How Marin Made Number* [Poster Presentation]. Cognitive Development Society, Montreal, Canada.
  46. Kahwaji, L., O'Connor, R., Hawes, Z., Howard, S.J., Merkley, R., Simms, V., The ONE team, Blakey, E., & Scerif, G. (July 2026). *ONE Programme, Many Classrooms: Practitioners' Perspectives on Successes, Challenges, and Adaptations*. [Poster Presentation]. The Mathematical Cognition and Learning Society, Padua, Italy.
  47. Marshall, L., Yu, S., Merkley, R., & LeFevre, J.-A. (July 2026). *Give me five: The development of quantity recognition*. [Poster Presentation]. The Mathematical Cognition and Learning Society, Padua, Italy.
  48. Marshall, L., Kahwaji, L. & Merkley, R. (June 2026). *"This many": A child's use of finger patterns to represent number*. [Poster Presentation]. Development, Montreal, Canada.
  49. Bourque, T., Slipenkyj, M., Chitranshi, A., Haslehurst, M., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (April 2026). *Finding theory in the classroom: Validating a teacher-led numeracy screener using classical effects from numerical cognition*. [Poster Presentation]. Cognitive Development Society, Montreal, Canada.
  50. Bourque, T., Slipenkyj, M., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (May 2026). *Soutenir l'éducation en langue française grâce au dépistage numérique en mathématiques*. [Poster Presentation]. Colloque international en education, Montreal, Canada.
  51. Bourque, T., Slipenkyj, M., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (June 2026). *Beyond Paper and Pencil: Insights into Students' Numerical Strategies from a Teacher-Led Digital Number Line Assessment used in Canadian Classrooms*. [Talk]. Development, Montreal, Canada.
  52. Slipenkyj, M., Bourque, T., Haslehurst, M., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (May 2026). *Two, Four, Six, Eight: Skip Counting Proficiency is Associated with Performance Differences Across Numerical Skills in the First Grade*. [Symposium Talk.] Jean Piaget Society, Ottawa, Canada.
  53. Slipenkyj, M., Bourque, T., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (June 2026). *Two, Four, Six and Three, Two, One: A Person-Centered Analysis on the Development of Counting Abilities*. [Lightening Talk]. Development, Montreal, Canada.
  54. Slipenkyj, M., Bourque, T., Anifowose, C., Merkley, R., Douglas, H., & LeFevre, J.-A. (July 2026). *Evaluating the associations between ordering abilities and number line estimation strategies*. [Symposium Talk]. The Mathematical Cognition and Learning Society, Padua, Italy.

55. LeFevre, J.-A., Slipenkyj, M., Douglas, H., Chitranshi, A., Bourque, T., Haslehurst, M., Anifowose, C., Kelly, S., & Merkley, R. (July 2026). *Growing pains: The development of numeracy screeners for Canadian students*. [Symposium Talk]. The Mathematical Cognition and Learning Society, Padua, Italy.
56. Kelly, S., Slipenkyj, M., Merkley, R., Douglas, H., & LeFevre, J.-A. (June 2026). *Comparing Digital and Paper Formats of an Early Numeracy Screener*. [Poster Presentation]. Development, Montreal, Canada.
57. Kelly, S., Slipenkyj, M., Merkley, R., Douglas, H., & LeFevre, J.-A. (June 2026). *Comparing Digital and Paper Formats of an Early Numeracy Screener*. [Lightning Talk]. Carleton Cognitive Science Student Conference, Ottawa, Canada.
58. Allan, K., & Merkley, R. (April 2026). *What did I just count? Exploring relations between visual working memory and preschooler's counting behaviours*. [Lightning Talk]. Carleton Cognitive Science Student Conference, Ottawa, Canada.
59. Allan, K., Cole, A., Ferguson, R., & Holm, O. (April 2026). *Thinking Twice: The Interplay Between Repetition, Need for Cognition, and the Illusory Truth Effect*. [Poster Presentation]. Carleton Cognitive Science Student Conference, Ottawa, Canada.
60. Allan, K., & Merkley, R. (May 2026). *What did I just count? Exploring relations between visual working memory and preschooler's counting behaviours*. [Poster Presentation]. Jean Piaget Society, Ottawa, Canada.

### Peer-reviewed Journal Articles

1. Hawes, Z., Whitehead, H.L., & Cai, Y., & Mussio, C. (registered report; accepted in principle). How language influences thought: The case of multiplying fractions. Submitted as a registered report to *Journal of Cognition and Development*
2. Youmans, A., Hawes, Z., Merkley, R., Gunning, S., Savelson, Z., Chisholm, L., Collins, M., Black, C., Godden, L., Montgomery, C., Tellos, A., & Lacelle, K. (2025). Co-constructing professional development: A framework for fostering educators' professional growth. *Canadian Journal of Science, Mathematics and Technology Education*, 25, 381-398. <https://doi.org/10.1007/s42330-025-00374-0>
3. Yu, S., Douglas, H. P., Susperreguy, M. I., Merkley, R. M., Chitranshi, A., Kahwaji, L., Marshall, L., Rice, J., Vellan, J. E., & LeFevre, J. Co-developmental trajectories of comparison, ordering, and arithmetic skills for children in grade 2 to grade 4. *Child Development*, 97(3), 1002–1012. <https://doi.org/10.1093/chidev/aacag029>
4. Merkley, R., Douglas, H., Kozak, A., Chitranshi, A., Gandhi, A., Hawes, Z., Houle, J., Kahwaji, L., McDonald, J. A., Maloney, E. A., Osana, H. P., Primeau, B., Rice, J., Rodrigues, M. L., Skwarchuk, S., Youmans, A., Yu, S., & LeFevre, J. (2026). The AIM Collective: Connecting research and practice in Canadian Early Mathematics education. *Mind Brain and Education*, 20(3). <https://doi.org/10.1111/mbe.70054>

Submitted for Publication:

1. Orsini, A., Youmans, A., Reed, B., & Osana, H. (2025). Instructional practices that support early mathematics learning: A scoping review. [Manuscript submitted for publication]. *Review of Education*.

In preparation

2. Orsini, A., Osana, H. P., Houle, J., Rice, J., & Lafay, A. (in preparation). *Supporting responsive numeracy teaching in early childhood: The Numeracy Kit for Kindergarten-Five-Year-Olds*. [Journal Article]

### **Book Chapters**

1. Orsini, A., Houle, J., Osana, H. P., Tellos, A., & Lafay, A. (2024). From participants to partners: Lessons learned from enacted curriculum research in early numeracy contexts. In Thompson, D. R., Huntley, M. A., & Suurtamm, C. (Eds.), *Lessons learned from research on mathematics curriculum* (pp. 399-420). Information Age. [Book chapter]

### **Conference Publications**

1. Orsini, A., Rice, J., Osana, H. P., Houle, J., & Lafay, A. (2023). Simulating a pedagogy of enactment may work for some early numeracy teachers but not others. In T. Lamberg, & D. Moss (Eds.), *Proceedings of the forty-fifth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 1) (pp. 712-721). University of Nevada—Reno.

### **Op-eds, articles in popular media**

1. Youmans, A., LeFevre, J., Douglas, H., & Anthony, T. (2023, September). Minding the Gap in Mathematics: Using a Numeracy Screener to Support Early Intervention. Education Canada. <https://www.edcan.ca/articles/minding-the-gap-in-mathematics/>
2. Slipenkyj, M., Douglas, H., LeFevre, J., & Merkley, R. (2026, January). Increasing math scores: Why Ontario needs early numeracy screening. *The Conversation*, February 3, 2026. <https://doi.org/10.64628/AAM.63une7wgd>

### **Reports, briefs, and other forms of grey literature**

1. UNESCO & UNICEF (2024). Global report on early childhood care and education: the right to a strong foundation. UNESCO Paris. DOI: 10.54675/FWQA2113
2. AIM Collective (2024). Assessment of the Early Math Skills Program in the Upper Grand District School Board. AIM Collective Report 2024\_UGDSB\_Intervention. <https://www.aimcollective.ca/reportugdsb>
3. AIM Collective (2024). Validating the EMA@School in the Kenora Catholic District School Board. AIM Collective Report 2024\_KCDSB\_Validation. <https://www.aimcollective.ca/reportkcdsbvalidating>
4. AIM Collective (2024). Assessment of the MATmatics intervention in the Grande Prairie Public School Division. AIM Collective Report 2024\_GPPSD\_Intervention. <https://www.aimcollective.ca/reportgppsd>

5. AIM Collective (2024). Evaluating the MATmatics intervention in the Kenora Catholic District School Board. AIM Collective Report 2024\_KCDSB\_Intervention. <https://www.aimcollective.ca/reportkcdsbevaluating>
6. AIM Collective (2025). Validation of the Provincial Numeracy Screening Assessment in the Fort Vermilion School Division. <https://www.aimcollective.ca/research/reports/assessment>
7. AIM Collective (2026). Educator Survey Report. AIM Collective Report 2026\_Educator\_Survey. <https://www.aimcollective.ca/research/reports/assessment>
8. AIM Collective (2026). Assessing the Early Math Skills Program in Grade One in the Upper Grand District School Board. AIM Collective Report 2026\_UGDSB\_Intervention.
9. AIM Collective (2026). Ten Minutes to Mastery: Evaluating a Tier 1 Fluency Program in Northern Alberta: Fort Vermillion, Peace River and Peace Wapiti School Divisions. <https://www.aimcollective.ca/research/reports>
10. AIM Collective (2026). Minutes to Mastery with Red Hot Math: Evaluating a Tier 1 Fact Fluency Program in Grande Prairie Public School Division. <https://www.aimcollective.ca/research/reports>

### **Podcasts**

1. Chitranshi, A., Kahwaji, K. (Hosts). (2023, June). Reflections on the AIM Summit with Rebecca Merkley, Julie Houle, and Tracie Anthony (No. 1) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-1-podcast>
2. Chitranshi, A., Kahwaji, K. (Hosts). (2023, October). Thinking out loud with Mike McMann and Jordan Temple (No. 2) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-2-podcast>
3. Chitranshi, A., Kahwaji, K. (Hosts). (2023, October). Fielding the way: Dr. Lynda Colgan and Dr. Jo-Anne Lefevre (No. 3) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-3-podcast>
4. Chitranshi, A., Kahwaji, K. (Hosts). (2024, April). AIM for resource curation: ToyBox Manitoba (No. 4) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-4-podcast>
5. Chitranshi, A., Kahwaji, K. (Hosts). (2024, April). A research practice collaboration- Concordia University and the Lester B Pearson School Board (No. 5) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-5-podcast>
6. Chitranshi, A., Kahwaji, K. (Hosts). (2024, April). AIM for resource curation: EMA@School (No. 6) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-6-podcast>
7. Chitranshi, A., Kahwaji, K. (Hosts). (2024, June). Sum-it-up with the AIM panel! (No. 7) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-7-podcast>
8. Chitranshi, A., Kahwaji, K. (Hosts). (2024, October). The collaborative math classroom: Reflections and recommendations by Sarah Powell and Alison Hardy (No. 8) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-8-podcast>
9. Chitranshi, A., Kahwaji, K. (Hosts). (2025, March). Pi-oneering math education: Keeping teachers at the centre with Dr. Sandy Youmans and Steph Gunning (No. 9) [Audio podcast episode]. In Collective Voices. <https://www.aimcollective.ca/ep-9podcast>