MCLS

THE MATHEMATICAL COGNITION AND LEARNING SOCIETY

THE SEVENTH ANNUAL
MCLS CONFERENCE

June 26-28, 2024
Washington, DC, USA

POSTERS

Poster Session 1 (Wednesday, 1:00-2:00 PM)

1. **Relations between speeded naming of small exact quantities and numeracy development for 7- to 8-year-old children**
   Jenna Rice[1], Jo-Anne LeFevre[1], Erin Maloney[2], Helena Osana[3], Sheri-Lynn Skwarchuk[4]
   [1]Carleton University; [2]University of Ottawa; [3]Concordia University; [4]The University of Winnipeg

2. **Are digital multiplication fact recall tasks an appropriate measure of children's multiplication recall and wider mathematics achievement?**
   Natasha Guy[1], Charlotte Wilks[2], Joanne Eaves[1], Lucy Cragg[2], Camilla Gilmore[1]
   [1]Loughborough University; [2]University of Nottingham

3. **Pathways to early success with fractions and their relation to cognitive and mathematical skills**
   Elena Silla[1], Alexandria Viegut[2], Eva Redican[1], Christina Areizaga Barbieri[1], Ilyse Resnick[3], Nora Newcombe[4], Nancy Jordan[1]
   [1]University of Delaware; [2]University of Wisconsin-Eau Claire; [3]University of Canberra; [4]Temple University

4. **Problem characteristics affecting one-digit multiplication solving in children from Grades 5 to 8**
   David Maxime Mueller[1], Jérôme Prado[2], Catherine Thevenot[1]
   [1]University of Lausanne; [2]University of Lyon

5. **Disentangling stimulus energy from temporal duration to probe the operational momentum effect in the time domain**
   Marie Jacquel, Arnaud Viarouge, André Knops
   Université Paris Cité

6. **A meta-analysis of the cross-sectional and longitudinal relations between executive functioning and math in early childhood**
   Bijan Tabrizian, Jane Hutchison, Ander Avdellas, Nina Bajnauth, Deborah Phillips, Ian Lyons
   Georgetown University

7. **Triangulating cognitive processes in mathematics and reading: An invitation to unify theories of learning systems**
   Garret Hall[1], Matthew Cooper Borkenhagen[1,2], Wilhelmina van Dijk[3], Jason Chow[4]
   [1]Florida State University; [2]Florida Center for Reading Research; [3]Utah State University; [4]Vanderbilt University

8. **The interplay between learning to think and thinking to learn: An intervention on metacognitive monitoring in arithmetic**
   Elien Bellon[1], Elisa Filevich[2], Wim Fias[3], Bert De Smedt[1]
   [1]KU Leuven; [2]Eberhard Karls Universität Tübingen; [3]Ghent University

9. **Evaluating the influence of symbolic sequence type and familiarity on order verification performance and strategy reporting**
   Michael Slipenkyj[1], James Vellan[2], Erika Ikeda[1], Jo-Anne LeFevre[2] Ian Lyons[1]
   [1]Georgetown University; [2]Carleton University

10. **Is there a relationship between frequency of home mathematical activities and children's mathematical outcomes? Data harmonisation and secondary analyses of UK-based datasets**
    Benjamin Hunt[1], Abbie Cahoon[1], Emma Blakey[2], Ella James-Brabham[2], Danielle Matthews[2], Victoria Simms[1]
    [1]Ulster University; [2]University of Sheffield

11. **Developing a rubric to evaluate how researchers report on the development of caregiver training: A systematic review**
    Mackenna Vander Tuin[1], Gena Nelson[2], Lois Ndungu[3]
    [1]The University of Texas at Austin; [2]University of Oregon; [3]Southern Methodist University

12. **Engagement-sensitive involvement: Parents adjust math practices based on child engagement**
    Jiawen Wu, Carolyn MacDonald, Daniel Hyde, Eva Pomerantz
    University of Illinois Urbana Champaign

13. **Exploring the home math environment: A comparative study of time diaries and questionnaires in predicting young children's math performance**
    Xinyun Lyu[1], Xinan Liu[1], Mingyue Pu[2], Jike Qin[1]
    [1]Xi'an Jiaotong-Liverpool University; [2]Kunming University

14. **Mothers' and fathers' number talk to toddlers and associations with toddlers' number skills**
    Nandini Rastogi[1], Alex Silver[1], Mackenzie Swirbul[2], Sarah Riley[2], Milagros Urioste Resta[3], Natasha Cabrera[4], Catherine Tamis-Lemonda[2], Melissa Libertus[1]
    [1]University of Pittsburgh; [2]New York University; [3]Lynn University; [4]University of Maryland, College Park

15. **Home numeracy and developmental delay: Lessons learned through a collaborative design process with children with disabilities**
    Emily Wilke[1], Madison Cook[1], Taylor Lesner[1], Marah Sutherland[1], Janice Fong[1], Mackenna Vander Tuin[2], Kevie Drake[1], Gena Nelson[1]
    [1]University of Oregon; [2]The University of Texas at Austin

16. **The causal role of the home environment on children's numerical skills. A pre-registered study of a familial intervention in preschoolers**
    Cléa Girard[1], Stien Callens[2], Angie De Lamper[1], Davina Van den Broek[1], Bert De Smedt[1]
    [1]KU Leuven; [2]Université Grenoble Alpes

17. **Assessing the home mathematics environment and its relation with mathematics attainment: A cross-country study of Mexican and Cuban dyads**
    Abbie Cahoon[1], Melissa Aloma[2], Nancy Estévez[2], Carolina Jiménez Lira[3], Daniela García[3], Elia Veronica Benavides Pando[3], Victoria Simms[1]
    [1]Ulster University; [2]Neuroscience Centre, Havana, Cuba; [3]Universidad Autónoma de Chihuahua

18. **Examining intervention effects on mathematics and domain general skills in first grade**
Lina Shanley[1], Madison Cook[1], Ben Clarke[1], Derek Kosty[2]
[1]University of Oregon; [2]Oregon Research Institute

19. **Dosage response in intensive math interventions for early elementary students with or at-risk for mathematics difficulties**
Anna Miller[1], Daniel Espinas[1], Daniel McNeish[2], Marcia Barnes[1]
[1]Vanderbilt University; [2]Arizona State University

20. **Equipartitioning learning of a neurodivergent student: Emerging understandings and emerging questions**
Angela Crawford
Boise State University

21. **It's about time: A deep dive into the contribution of timed elements in mathematics instruction**
Rene Grimes
Tennessee Tech University

22. **Impact of guided play from numerical learning trajectories in kindergarten**
Yovanna Galaz[1], Christian Peake[1], Esmeralda Dionicio[2]
[1]Diego Portales University, Chile - Alberto Hurtado University, Chile - Millennium Nucleus for the Study of the Development of Early Math Skills (MEMAT), Chile; [2]Pontificia Universidad Católica de Chile - Millennium Nucleus for the Study of the Development of Early Math Skills (MEMAT), Chile

23. **Latine Dual Language Learners' (DLLs') bilingual development in mathematics and cognition: A longitudinal latent profile analysis**
Matthew Foster[1], Lisa López[1], Karen Nylund-Gibson[2], Shaunacy Sutter[1], Dina Naji Arch[2]
[1]University of South Florida; [2]University of California, Santa Barbara

24. **Exploring the casual impact of language transparency on early numerical acquisition in children: A preregistration report**
Yixi Han, Qi Zhou, Jike Qin
Xi'an Jiaotong-Liverpool University

25. **Examining the interplay of language, executive function, and early numeracy skills**
Yemimah King, Gary Bingham
Georgia State University

26. **A cross-national study of math language learning**
Taeko Bourque[1], Chang Xu[2], Victoria Simms[3], Sheri-Lynn Skwarchuk[4], Helena Osana[5], Erin Maloney[6], Jo-Anne LeFevre[1], Judith Wylie[2]
[1]Carleton University; [2]Queen's University Belfast; [3]Ulster University; [4]University of Winnipeg; [5]Concordia University; [6]University of Ottawa

27. **Expressive and receptive language skills of children with and without mathematics difficulty**
Yang Fu[1], Jason Chow[2]
[1]University of Maryland College Park; [2]Vanderbilt University

28. **Comparison of technical asl and manually coded English for learning quantitative content**
Rachel Sortino[1], Christina Kim[1], Thalia Guettler[1], Katie McClyman[1], Bradley White[1], Colin Lualdi[2], Alicia Wooten[1], Lorna Quandt[1], Rachel Pizzie[1]
[1]Gallaudet University; [2]University of Illinois Urbana-Champaign

29. **Does the structure of numerals in Colombian Sign Language impact deaf children's understanding of the additive composition of numbers?**
Diego Guerrero[1], Alejandra Herrera[2], Cesar Mejia[2]
[1]Universidad del Valle; [2]Universidad San Buenaventura (Cali-Colombia)

30. **Relations between children's math vocabulary and error patterns when solving math word problems**
Maegan Reinhardt[1], Isabel Valdivia[1], Jisun Kim[1], Tamika McElveen[2], Amanda Mayes[3], Michael Eiland[3], Ma Bernadette Andres-Salgarino[4], Sarah Powell[5], Sara Schmitt[6], Caroline Hornburg[1]
[1]Virginia Tech; [2]Miami University; [3]Purdue University; [4]Santa Clara County Office of Education; [5]The University of Texas at Austin; [6]University of Oregon

31. **Early math at home: The impact of board games on caregivers' math knowledge, interest, and confidence**
Clarence Ames, Emmett Speed
Utah STEM Action Center

32. **The SNARC effect in Mayan numerals: Effects of language transparency and reading direction on novel symbolic number understanding**
Emmett Speed, Cassandra Ivie, Kerry Jordan
Utah State University

33. **Math gender beliefs in kindergarteners utilizing mosaic approach**
Macarena Angulo[1]
[1]Universidad Diego Portales, Chile/Millennium Nucleus for the Study of the Development of Early Math Skills (MEMAT)

34. **Does sharing distract you? Effects of perceptual features on third graders' partitioning strategies**
Caitlin Macevicius, Helena P. Osana
Concordia University

35. **Are math-related individual differences associated with COVID-19-related graph interpretation accuracy?**
Sharon Jaramillo[1], Abigail O'Brien[1], Lauren Schiller[1], Charles Fitzsimmons[2], Dan Scheibe[1], Jennifer Taber[1], Karin Coifman[1], Percival Mathews, Marta Mielicki, Erika Waters
[1]Kent State University; [2]University of North Florida

36. **Does introducing perceptually rich manipulatives in different ways influence how 4-5-year-old children perceive and use them to complete mathematical tasks?**
Megan Foulkes, Francesco Sella, Camilla Gilmore
Loughborough University

37. **Associations between young children's flexible attention to numerical and spatial magnitudes and early math skills**
Mary Wagner, Marissa Brown, Molly Griffin, Mitchell Hanson, Danielle Barrett, Julia Fabian, Madelyn Hales
University of Dayton

38. **Lessening the gap: Worked examples, self-explanation, and metacognition across levels of expertise in math learning**
Melanie Prieto, Hannah Hausman
University of California, Santa Cruz

Poster Session 2 (Wednesday, 5:00-6:00 PM)

1. **What strategy does the development of ordinality in kindergarteners rely on: Cardinality or sequential knowledge?**
   Christian Peake[1], Felipe Sepúlveda[2], M. Inés Susperreguy[3], Laura Espinoza[4], Yovanna Galaz[2], Richard Merino[1], Antonia Varas[2]
   [1]Universidad Diego Portales; [2]Universidad Católica de la Santísima Concepción; [3]Universidad Católica de Chile; [4]Universidad de Los Lagos

2. **Validation of a novel toddlerhood self-regulation measure and examining its relations to preacademic outcomes**
   Jorge Carvalho Pereira[1], Leanne Elliott[2], Portia Miller[1], Heather Bachman[1], Elizabeth Votruba-Drzal[1], Melissa Libertus[1]
   [1]University of Pittsburgh; [2]American Institutes for Research

3. **Metacognitive control in arithmetic: A longitudinal exploration of post-error adjustments in 7-9-year-olds**
   Eveline Jacobs, Elien Bellon, Bert De Smedt
   KU Leuven

4. **Math word problem solving: Relation to spatial skill, working memory, and problem type**
   Dania Carr, Susan Levine
   University of Chicago

5. **Exploring cognitive foundations of children's numerical development**
   Anna Karlsson, Kenny Skagerlund, Mikael Skagenholt, Ulf Träff
   Linköping University

6. **Exploring the impact of a portfolio of co-designed mathematics interventions that leverage executive functions**
   Megan Brunner[1], Karen Douglas[1], Rebecca Merkley,2 Michelle Tiu[1], Aubrey Francisco[1]
   [1]EF + Math Program; [2]Carleton University

7. **Cognitive-linguistic skills and preschool children's development of story problem solving: The sequential mediation roles of three levels of numeracy skills**
   Catrina Cuina Liu[1], Xiao Zhang[2], Wai Ming Cheung2
   [1]The Hong Kong Polytechnic University; [2]The University of Hong Kong

8. **Working with numbers: Does task content influence the measurement of executive functions and their relation to math ability?**
   Alexa D. Mogan[1], Nathan T.T. Lau[2], Amelia Murray[1], Monica Bashir[1], Eric D. Wilkey[1]
   [1]Vanderbilt University; [2]Western University

9. **College students' strategy choice in fraction comparison and its relation to math achievement and executive functions**
   Ao Fan[1], Roberto Abreu-Mendoza[2], Jo Van Hoof[3], Wim Van Dooran[3], Miriam Rosenberg-Lee[1]
   [1]Rutgers University - Newark; [2]Indiana University; [3]University of Leuven

10. **Investigating the link between Chinese students' ratio processing system and symbolic fraction comparison**
    Xiaotong Yi[1], Connie Barroso[1], Percival Matthews[2]
    [1]Texas A&M University; [2]University of Wisconsin Madison

11. **Numerical activities of daily living in aging adults**
    Olivia Ewing, Sarah Pope, Kerry Jordan
    Utah State University

12. **Differential magnitude estimation of big and small ratios**
    Nicola Morton, Sheena Henderson, Jacinta Cording, Randolph Grace
    University of Canterbury

13. **Examining the role of math talk tips during parent-child shared reading**
    Yilin Liu, Mary DePascale, Eric Dearing
    Boston College

14. **Is math part of a complete breakfast?: Content analysis of math-based activities on breakfast cereal boxes**
    Salvador R. Vazquez, Sarah H. Eason
    Purdue University

15. **Associations among quantitative and qualitative dimensions of the home math environment and young children's math skills**
    Isabel Valdivia, Maegan Reinhardt, Jisun Kim, Ninie Asad, Lilly Nelson, Alexis Whitfield, Rachel Thompson, Caroline Hornburg
    Virginia Tech

16. **Fathers' and mothers' reports of their attitudes to and experiences of the home mathematical environment**
    Heather Lyle, Judith Wylie
    Queen's University Belfast

17. **Does parent math anxiety and performance relate to math talk with toddlers?**
    Shanttell Fernandez[1], Mackenzie Swirbul[2], Alex Silver[1], Catherine Tamis-LeMonda[2]
    [1]Hunter College; [2]New York University

18. **Enhancing e-book interactions for Latine families and children**
    Fabiola Herrera[1], Susana Beltrán-Grimm, David Purpura
    Purdue University

19. **Implementing a tier 2 early numeracy intervention for students with mathematics difficulties**
    Soyoung Park
    University of Central Florida

20. **Embodied-cognition intervention for numerical deficits after a stroke/brain-injury (acalculia)**
    Yael Benn[1], Berzan Cetinkaya[2], Maryam Hussain[2], Verena Christin Pavel[1], George Kountouriotis[1], Tam Dibley[1], Mark Jayes[1], Paul Conroy[3]
    [1]Manchester Metropolitan University; [2]University of Manchester; [3]Trinity College Dublin

21. **Manipulating money in math: (Whom) does it help ?**
Styliani Politi[1], Caroline Hornung[1], Christine Schiltz[1]
[1]University of Luxembourg, Luxembourg

22. **The impact of an adaptive math learning tool focused on improving number sense a longitudinal study on NY District grade 1-3 students**
Margot Röell[1], Catherine de Vulpillières[2], André Knops[2]
[1]EvidenceB; [2]Université Paris Cité

23. **Failure attributions and the development of math anxiety**
Zhe Wang, Anjali Chaudhary, Minchao Wang, Connie Barroso
Texas A&M University

24. **Examining the role of spatial, affective, and mathematical processes and gender in postsecondary precalculus**
Robert Wilbur[1], Kinnari Atit[2], Prashansa Agrawal[1], Catherine Lussier[1], Bryan Carrillo[2], Dylan Noack[3], Yat Sun Poon[1], David Weisbart[1]
[1]University of California, Riverside; [2]Saddleback College; [4]Yuba College

25. **Empowering math achievement: The interplay of math self-competence and math avoidance in primary school students**
Sara Caviola, Alice Masi, Enrico Toffalini
University of Padova

26. **Math Anxiety predicts the difference in sympathetic arousal between days of math learning.**
Cynthia Fioriti[1], Jiuru Wang[1], Rachel Pizzie[2], Ian Lyons[1]
[1]Georgetown University; [2]Gallaudet University

27. **Psychometric properties of the Academic Anxiety Inventory in the Deaf, DeafBlind, and Hard-of-Hearing community**
Christina Kim, Rachel Sortino, Rachel Inghram, Isabelle Diaz, Thalia Guettler, Taylor Delorme, Katie McClyman, Rachel Pizzie
Gallaudet University

28. **Can a workshop for high school teachers influence their attitudes and beliefs, ultimately impacting both teachers' and students' classroom nervousness about maths?**
Isadora T. Braga-Nicoletti[1], Mariuche Gomides[2] , Flavia H. Santos[2]
[1]São Paulo State University; [2]University College Dublin

29. **The development and pilot testing of Math Lions: a math anxiety intervention for children**
Colleen M. Ganley[1], Zahra Maghami Sharif[1], Sally Cole[1], Nandrea Burrell[1], Emma Doyle[1], Olivia K. Cook[1], Federica Granello[2], Matthew Viverito[1], Christy Allen[1], Alexandria Meyer[3], Sara Hart[4], Maria Chiara Passolunghi[2]
[1]Florida State University; [2]University of Trieste; [3]Santa Clara University; [4]University of Waterloo

30. **The influence of anxiety on the intersecting perception of space and time**
Kimberly Webb-Zimmerman, Kerry Jordan
Utah State University

31. **Does math confidence mean math ability in school-aged girls?**
Mariah Cantrell, Abiola Lawal, Annahita Modirrousta, Meechie Poston, Madelyn Buckley, Emma Longville, Kaitlyn Rosolanko, Emma Seifert, Destiny Thomas, Yvette Harris
Miami University

32. **The role of gesture that accompanies instruction of a statistical concept: computational versus conceptual approaches**
Nina Semushina[1], Zena Levan[1], Aura Fuentes-Flores[1], Cheng Xu[1], Ruth B. Church[2], Susan Goldin-Meadow[1]
[1]University of Chicago; [2]Northeastern Illinois University

33. **Cognitive and academic profiles of students with and without math learning difficulties**
Jessica Namkung
University of Delaware

34. **Strategy choices and common errors in fraction and decimal number line estimation tasks among upper elementary students**
Jinyoung Heo, Soo-hyun Im
Hanyang University

35. **Inhibition of the "add zero(s)" heuristic is needed to multiply by 10, 100, 1000 decimal numbers: A developmental conflict adaptation paradigm study**
Maria Ghazi, Grégoire Borst
Université Paris Cité

36. **Towards a cognitive archaeology of mathematics in the american southwest**
Alma McKown
Albuquerque Public Schools and Central New Mexico Community College

37. **Understanding the complexity of preschool teachers' math knowledge: Insights from decontextualized versus scenario-based assessments**
Jiwon Ban, Elida V. Laski
Boston College

Poster Session 3 (Thursday, 1:00-2:00 PM)

1. **Instructional framing and math performance: The relevance of state and trait math anxiety**
   Thomas Hunt[1], Eric Steiner[2]
   [1]University of Derby; [2]National University

2. **Time pressure predicts negative cognitive and affective outcomes in mathematics**
   Raeanne N. Martell, Alexander Avdellas, Ava Cobarrubias, Vincent Miller, Howard Tai, Ian M. Lyons
   Georgetown University

3. **Tactile bilateral stimulation for math anxiety: A pilot study**
   Leyla Karami Isheqlou, Tori Dehlin, Cassey Ivie, Kerry Jordan
   Utah State University

4. **MotivUP: An innovative application to assess students' motivation for mathematics**
   Kamila Schulz[1], Christian Peake[1], Yovanna Galaz[1], Matias Rojas[1], Diego Esperidion[1], Sara Caviola[2]
   [1]Universidad Diego Portales; [2] University of Padova

5. **Investigating the effects of classroom-based mindfulness on math anxiety: Does improving emotional regulation enhance math performance?**
   Anna George, Nadine Yildiz, Darcy Hallett
   Memorial University of Newfoundland

6. **Mathematics anxiety and number processing: The link between executive functions, cardinality, and ordinality**
   Kenny Skagerlund
   Linköping University

7. **How do metacognitive experiences and math anxiety predict mathematical problem solving?**
   Daniel Scheibe, Alissa McGill, Sharon Jaramillo, Clarissa Thompson
   Kent State University

8. **The gender gap in math anxiety (and in a link between math anxiety and math performance too) is not so salient when other anxieties are controlled for**
   Monika Szczygieł, Mateusz Hohol
   Jagiellonian University

9. **Analysis of errors in student work on elementary fraction assessments**
   Gabriella Lyth Donofrio, Emily Singell, Allison Dennis McClure, Megyn Martin
   University of Missouri at Columbia

10. **Math instruction that includes gesture improves learning for deaf and hearing children when gesture is simultaneously produced with language**
    Zena Levan[1], Nina Semushina[1], Ruth B. Church[2], Naureen Hemani-Lopez[1], Susan Goldin-Meadow[1]
    [1]University of Chicago; [2]Northeastern Illinois University

11. **Kindergarten students' motivation: Linked to general mathematical knowledge but not to their performance on a tablet-based math game**
    Felipe Sepulveda[1,2], Antonia Varas[1] , Christian Peake[3,4]
    [1]Universidad Católica de la Santísima Concepción; [2]Núcleo Milenio para la Ciencia del Aprendizaje (MiNSoL), Chile; [3]Universidad Diego Portales; [4]Núcleo Milenio para el Estudio del Desarrollo de las Habilidades Matemáticas Tempranas (MEMAT)

12. **Multiplying student success in early mathematics: Sharing insights from research-practice partnerships**
    Liza Kahwaji[1], Ayushi Chitranshi[1], Abbey Gandhi[1], Stephen Hurley[2], Jo-Anne LeFevre[1], Erin Maloney[3], Sheri-Lynn Skwarchuk[4], Madison Young, Chy Zhang[4], Rebecca Merkley[1]
    [1]Carleton University; [2]voicEd Radio, Canada; [3]University of Ottawa; [4]University of Winnipeg

13. **Understanding arithmetic principles correlates with approximate computation ability**
    Mingxin Yu, Bowen Xu, Shaungyu Zhang, Xinlin Zhou
    Beijing Normal University

14. **Bridging the gap: A professional development program to enhance preschool teachers' confidence in stem education with a focus on early math skills**
    Hannah Smith[1], Madison Berube[2], Paul Reimer[2]
    [1]Assumption University; [2]AIMS Center for Math and Science

15. **Examining math word-problem solving in 3rd-graders with math difficulty using a worked examples measure**
    Vishakha Agrawal[1], Anna H. Miller[1], Hailey Kepiro[1], Marcia A. Barnes[1], Sarah R. Powell2
    [1]Vanderbilt University; [2]The University of Texas at Austin

16. **Visualize and operate with multi-dimensional data**
    Minzhi Liu, Matthew Lira
    University of Iowa

17. **Investigating multimodal fusion of structural and functional brain imaging components supporting the development of number processing and mathematics ability in children**
    Mikael Skagenholt, Kenny Skagerlund, Ulf Träff
    Linköping University

18. **Investigating the neural underpinnings of math and reading across the lifespan**
    Hillary Mastarciyan[1], Devin Sodums[2], Ju-Chi Yu[3], H. Moriah Sokolowski[1]
    [1]Toronto Metropolitan University; [2]Rotman Research Institute, Baycrest Health Sciences; [3]Campbell Family Mental Health Research Institute, Centre for Addiction and Mental Health

19. **Functional activation patterns in developmental dyscalculia across arithmetic, magnitude processing, and visuospatial working memory tasks**
    Eric D. Wilkey[1], Isabella Starling Alves[1], Lien Peters[2], Fu Yu Kwok[3], Daniel Ansari[4]
    [1]Vanderbilt University; [2]Ghent University; [3]Macquarie University; [4]Western University

20. **EEG measurement of specific number representation in the human brain**
    Miaofan Chen, Richard Prather
    University of Maryland - College Park

21. **Two sides of a similar coin? Exploring the distinct and shared neural correlates of early precursors to math and**

reading
Raveena Gill, Alina Sanina, Alyssa Wright, Amy S Desroches, Stephanie Bugden
University of Winnipeg

22. **Resting state functional connectivity in 1st graders identified for math support in the classroom**
Isabella Starling-Alves[1], Lina Shanley[2], Madison Cook[2], Marcia Moore[2], Jolinda Smith[1], Fred Sabb[2], Ben Clarke[2], Eric D. Wilkey[1]
[1]Vanderbilt University; [2]Oregon University

23. **Math achievement and functional connectivity differences in young adults with and without autism**
Chinedu Nkwo[1], Roberto A. Abreu-Mendoza[2], Cory McCabe[1], William Graves[1], Miriam Rosenberg-Lee[1]
[1]Rutgers University - Newark; [2]Indiana University Bloomington

24. **Does childhood experience with the abacus influence mathematics performance in adulthood?**
Pragati Maheshwary, Lauren Anthony, Martha Alibali
University of Wisconsin-Madison

25. **Arithmetic in two languages: Localizing simple multiplication processing in the bilingual brain**
Vanessa Cerda[1], Macarena Suarez-Pellicioni[2], James Booth[1], Nicole Wicha3
[1]Vanderbilt University; [2], University of Alabama; [3]University of Texas at San Antonio

26. **Numerical processing in the parietal cortex, through the lens of acalculia cases**
Erin Duricy, Corrine Durisko, Julie Fiez
University of Pittsburgh

27. **Teaching mathematics in early childhood education - the role of spatial reasoning in children's mathematics learning.**
Rachel Politt
University of Melbourne

28. **Intrinsic rather than extrinsic spatial skills predict planar geometric proof performance**
Yuhan Zhang, Jianing Lv, Xinlin Zhou
Beijing Normal University

29. **Transfer of gains from spatial training to math performance: The role of training delivery and working memory**
Chloe Oi Ying Leung, Marian Hickendorff, Christine Espin, Dietsje Jolles
Leiden University

30. **Examining kids' intuitive understanding of mechanical system through gears task**
Nicole Taboada, Allison Fitch, Rain Bosworth
Rochester Institute of Technology

31. **Symbolic and non-symbolic number representations: Leveraging language variation**
Clifton Langdon[1], Marie Coppola[2]
[1]Rochester Institute of Technology; [2]University of Connecticut

32. **Whole-number magnitudes interfere with decimal processing in children across strategies, and high performers additionally process rational magnitudes**
Piper Rennerfeldt[1], Roberto Abreu-Mendoza[2], Miriam Rosenberg-Lee[1]
[1]Rutgers University - Newark, NJ; [2]Indiana University, Bloomington

33. **Impact of inhibitory control and continuous magnitude on dot comparison performance in children with mathematical difficulties**
Cristina Rodríguez[1], Roberto A. Ferreira[2]
[1]Millennium Nucleus for the Science of Learning, Universidad Católica del Maule; [2]Universidad de Talca

34. **The differential developmental trajectory for symbolic and situational mathematics abilities**
Chaoran Shen, Qingyuan Chen, Nan Zhang, Fengxin Diao, Pengfei Liu, Xinlin Zhou
Beijing Normal University, China

35. **Mental strategies for estimating the relative magnitude of exponential expressions**
Amber Armstrong[1], Rina Harsch[1], Jeffrey Bye[1], Shashank Varma[2]
[1]University of Minnesota; [2]Georgia Institute of Technology

36. **Situational mathematical ability lags far behind symbolic mathematical ability among middle school students**
Jianing Lyu[1], Yi Liu[1], Chenye Bao[2], Xinlin Zhou[1]
[1]Beijing Normal University; [2]University of Missouri

37. **Finger-based and verbal cardinal representations in young children born pre-term**
Laurence Rousselle, Auriane Leclercq, Line Vossius, Maëlle Neveu
University of Liège

Poster Session 4 (Friday, 1:00-2:00 PM)

1. **Math meets science: Enhancing children's interpretations of 2x2 data tables**
   Rui Meng, Martha Alibali
   University of Wisconsin Madison

2. **Diagnosing fraction misconceptions: Illustrating the development of a concept inventory for use with diagnostic cognitive assessment**
   Katherine Rhodes, Lourdes Acevedo-Farag, Kreshnik Begolli, Drew Bailey, Siling Guo, Andres Bustamante, June Ahn, Lindsey Richland
   University of California, Irvine

3. **It's me, hi, I'm in the problem, it's me**
   Cheryll Fitzpatrick, Matthew Rideout
   Memorial University of Newfoundland

4. **Undergraduates' evaluations of arguments about dividing by zero**
   Lauren Sprague, Addie Mitchell, David W. Braithwaite
   Florida State University

5. **A review of recently developed numeracy assessment, instruction and intervention resources from canada**
   Jessica Shapiro[1], Sarah Melo[2], Sheri-Lynn Skwarchuk[1]
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6. **SPecialized Instruction to Reach All Learners (SPIRAL) Professional Learning-Coaching Model**
   Katie MacLean, Alison Hardy
   The University of Texas at Austin

7. **Mitigating the effect of computer programming anxiety on college level and early career computer scientists**
   Alissa McGill, Susan Fisk, Audrey Rorrer, Tom McKlin, Veronica Catete, Tiffany Barnes, Jamie Payton, Clarissa Thompson
   Kent State University

8. **Math Playtime: A playful approach to socializing children's math skills at home**
   Michele Stites, Susan Sonnenschein, Besjane Krasniqi
   University of Maryland Baltimore County

9. **Is teaching mathematics hard? Is it harder to teach inclusive mathematics, computational thinking, and engineering?**
   Michele Stites[1], Susan Sonnenschein[1], Jonathan Singer[1], Hsiu-wen Yang[2], Chih-Ing Lim[2], Megan Vinh[2], Hatice Gursoy[1], Freya Kaur[1], Besjane Krasniqi[1]
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10. **Structural brain correlates of subtraction and multiplication performance and their interaction with age in children**
    Reyhan Shorbi, Macarena Suarez-Pellicioni, Firat Soylu
    The University of Alabama

11. **Neural representation of discrete and continuous ratios: An fMRI study**
    Rebekka Lagacé-Cusiac, Jessica Grahn, Daniel Ansari
    Western University

12. **Tracking the magnitude discrimination of two-digit number symbols with frequency-tagging EEG: a feasibility study**
    Amandine Van Rinsveld[1], Christine Schiltz
    [1]Université libre de Bruxelles; [2]University of Luxembourg

13. **The neural basis of number processing and its relation to individual differences in 4th graders' math competence**
    Xueying Ren, Marc N. Coutanche, Julie A. Fiez, Melissa E. Libertus
    University of Pittsburgh

14. **Financial Abilities: is there more to it than mathematics? A VLSM study on stroke patients**
    Laura Danesin[1], Maria Grazia Ranzini[2], Arianna Menardi[2], Giorgia Baron[1], Gabriella Bottini[3], Antonino Vallesi[2], Carlo Semenza[2], Francesca Burgio[1]
    [1]IRCCS San Camillo Hospital, Venice; [2]University of Padua; [3]University of Pavia

15. **How the association between behavior and event-related potential in numerical symbol acquisition develops with grade and exercise**
    Shuangrao Qi, Yuhan Zhang, Naiqian Luan, Xinlin Zhou
    Beijing Normal University

16. **Decoding fraction magnitude from EEG signals using machine learning**
    Brian Rivera
    University of Nebraska Lincoln

17. **A study on playing cards to disentangle order and magnitude in the SNARC effect**
    Mauro Murgia[1], Valter Prpic[2], Serena Mingolo[1], Krzysztof Cipora[3]
    [1]University of Trieste; [2]University of Bologna; [3]Loughborough University

18. **The relation between number line performance and mathematics outcomes: Two meta-analyses**
    Zehra Unal[1], Züleyha Terzi[2], Beyzanur Yalvaç[2], David Geary[1]
    [1]University of Missouri; [2]Boğaziçi University

19. **Re-examining differences and ratios in perceptual comparisons: Dual-operational control across restricted stimulus ranges**
    Cameron Hooson-Smith, Nicola J. Morton, Simon Kemp, Randolph C. Grace
    University of Canterbury

20. **Contrasting ANS performance and sensitivity to numerical and non-numerical information for stimuli presented in a separate or intermixed manner**
    David Gomez[1,2], Felipe Leiva[1,2], Valentina Giaconi[1,3]
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21. **Pupillometry as a measure of error detection in mathematics**
    Maria Brandao, Darko Odic
    University of British Columbia

22. **Exploring groupitizing behaviors in first graders: A study on counting strategies and finger representations**
Céline Poletti, Catherine Thevenot
University of Lausanne

23. **Does eight equal eight? The role of counting knowledge in children's understanding of exact equality**
Khuyen Le, Rafael Núñez, David Barner
University of California, San Diego

24. **Individual differences in human clustering**
[1]Shubh Goyal, Vijay Marupudi[2], Sashank Varma[2], V.N. Vimal Rao[1]
[1]University of Illinois at Urbana-Champaign; [2]Georgia Tech

25. **Might visual clustering underlie numerosity estimation?**
Vijay Marupudi[1], Shubh Goyal[2], Vimal Rao[2]
[1]Georgia Tech; [2]University of Illinois

26. **Numerical values modulate size perception**
Aviv Avitan
Ben-Gurion University of the Negev

27. **Maternal education and motor skills: Predictors of early precursor math skills in three-and-four-year-old Mexican children**
Elia Verónica Benavides Pando, Carolina Jiménez Lira, Daniela Susana Paz García, Martha Ornelas Contreras, María Inés Susperreguy
Universidad Autónoma de Chihuahua; Pontificia Universidad Católica de Chile

28. **Examining the developmental trajectories of basic numerical skills and the contribution of domain-general cognitive factors**
Hanna Weiers[1], Sohnia Ghattaura[1], Franz Wortha[1], Camilla Gilmore[1], Gaia Scerif[2], Iro Xenidou-Dervou[1], Francesco Sella[1]
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29. **Nonsymbolic proportional estimation profiles are not associated with better magnitude understanding at the early stages of fraction instruction**
Roberto A. Abreu-Mendoza, Elizabeth A. Gunderson
Indiana University, Bloomington

30. **Correlation between symbolic and non-symbolic matemathical skills in 4-year-old children measured through a digital tool**
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31. **Building fraction magnitude understanding through perceptual cues: A Stroop fraction number line task**
Robert Quintana
University of Wisconsin-Madison

32. **Boundary effects in graduate students' memory of the numerical magnitude of p-values**
V.N. Vimal Rao[1], Ali Fulsher[2], Jeffrey K. Bye[2]
[1]University of Illinois at Urbana-Champaign; [2]University of Minnesota

33. **Is 16/9 more than 13/8? Fraction comparison performance depends on symbolic format, problem features, and attitudes**
Jennifer Murray, Megan Smitz, Martha Alibali
University of Wisconsin - Madison

34. **Do people rely on symbolic number strategies in discrete proportional reasoning?**
Paige Dadika, Michelle Hurst
Rutgers University

35. **Processing speed links approximate number system and arithmetic abilities**
Shiqiao Shen, Wei Wei
Zhejiang University, China

36. **Do fine motor skills and finger gnosia predict the development of arithmetic through finger-use? A longitudinal study to investigate the functionalist hypothesis**
Maëlle Neveu, Laurence Rousselle
University of Liège

37. **Seeing the whole picture: Fraction magnitude processing using non-symbolic fractions**
Saranya Kumary, Amanda George, Darcy Hallett
Memorial University of Newfoundland