June 23-25

MCLS

THE MATHEMATICAL COGNITION AND LEARNING SOCIETY

- THE NINTH ANNUAL CONFERENCE – PADOVA 2026

UNIVERSITÀ DI PADOVA
Dipartimento
di Psicologia generale

UNIVERSITÀ DI PADOVA
Dipartimento
di Psicologia dello Sviluppo
e della Socializzazione

TUESDAY JUNE 23

	Room A+B: Psico 3	Room T1: CLA	Room T2: CLA	Room T3: CLA	Room T4: CLA
8:15-9:00	**Registration & Welcome**				
9:00-10:15 ***Symposia***	S1: A cross-linguistic perspective on numerical cognition	S2: Developmental Dyscalculia - bridging research and practice	S3: Long-term memory for numerical information: New perspectives on the relationship between long-term memory and mathematical skills	S4: Exploring order processing: mechanisms, strategies, and mathematical development	S5: Perceiving and processing empty sets as zero: evidence from fish, chicks, preschoolers and adults
10:15-10:45	**Coffee Break**				
10:45-12:15 ***Individual Talks***	IT1: Individual Talks	IT2: Individual Talks	IT3: Individual Talks	IT4: Individual Talks	IT5: Individual Talks
12:15-1:15	**Lunch: Campus main square; Mentoring lunch**				
1:15-2:00 ***Posters & Lightning Symposia***	**Poster Session 1: CLA building, first floor**				
	LS1: Dyscalculia across the lifespan: Early screening approaches and the consequences of missed diagnosis			LS2: Analyzing specific learning environments to understand mathematical outcomes	
2:00-3:15 ***Symposia***	S6: Does math anxiety undermine learning? Developmental pathways, threat responses, and disengagement across different learners	S7: Perspectives on mathematical cognition from Latin America	S8: From early numerical representations to arithmetic skills: insights into mathematical learning difficulties	S9: Number concept acquisition in young children	S10: The nature and mechanisms of numerosity perception
3:15-3:45	**Coffee Break**				
3:45-5:00 ***Symposia***	S11: Sensorimotor foundations of numerical cognition	S12: Developing flexibility in mathematical problem-solving	S13: Randomised control trials: from theory to practice in improving mathematical skills	S14: Mathematics anxiety across the lifespan: Bridging developmental and contextual perspectives.	S15: Understanding dysfluency in arithmetic: early indicators, persistence, and intergenerational pathways
5:00-5:45 ***Posters & Lightning Symposia***	**Poster Session 2: CLA building, first floor**				
	LS3: Sharpening the conceptualization of the home (numeracy) environment			LS4: Math for real life: rethinking curriculum and intervention through everyday mathematical reasoning	
5:45-7:00	**MCLS Social Reception: Campus main square**				

WEDNESDAY JUNE 24

	Room A+B: Psico 3	Room T1: CLA	Room T2: CLA	Room T3: CLA	Room T4: CLA
9:00-10:15 ***Symposia***	S16: Beyond number: Cross-domain interactions of numerical and quantitative information	S17: Beyond main effects in early mathematics: contextual and behavioral moderators	S18: Spatial skills as a foundation for mathematics: development, diversity, and educational impact	S19: Math anxiety through the lens of intervention studies: Developmental and classroom insights among elementary schoolers	S20: SNARC: universality within and between subjects and new methodological advances
10:15-10:45	**Coffee Break**				
10:45-12:15 ***Individual Talks***	IT6: Individual Talks	IT7: Individual Talks	IT8: Individual Talks	IT9: Individual Talks	IT10: Individual Talks
12:15-1:15	**Lunch: Campus main square; MCLS Board Meeting (ROOM T1 – CLA, from 12:30)**				
1:15-2:00 ***Posters & Lightning Symposia***	**Poster Session 3: CLA building, first floor**				
	LS5: Convergent methodologies in numerical cognition: Computational and neuroscientific perspectives on gender and individual differences			LS6: Mathematics research: Teacher outcomes as critical indicators	
2:00-3:15 ***Symposia***	S21: When numbers take sides: The conditional nature of symbolic and non-symbolic spatial-numerical associations in humans	S22: The link between math language and math skills in varying contexts	S23: Beyond maths anxiety: The developmental origins of mathematics-related emotions and their consequences in adults	S24: The emergence and cognitive foundations of early symbolic math skills	S25: Diverse pathways to improving elementary mathematics learning: daily routines, tutoring, and digital tools across contexts
3:15-3:45	**Coffee Break**				
3:45-5:00 ***Symposia***	S26: Not all play is equal: Playful math interventions for preschool and elementary-age children	S27: Word-problem problems? No problem! Problem-solving strategies for supporting students experiencing mathematics difficulty	S28: Spatial numerical associations: Development, culture and biological roots	S29: When numbers speak: Linguistic structure in numerical cognition	S30: Pathways through which socializers' math anxiety relates to children's math achievement
5:00-5:45 ***Posters & Lightning Symposia***	**Poster Session 4: CLA building, first floor**				
	LS7: Capturing the complexity of mathematical cognition beyond the lab: Inclusive research in practice			LS8: Game-based Learning as a Tool to Understand and Improve Maths Cognition and Learning	
5:45-7:00 ***Symposia***	S31: Strategy flexibility and adaptivity across development, instruction, and cognitive domains	S32: From arithmetic foundations to rational number reasoning: Developmental trajectories and difficulties	S33: Exploring new perspectives on spatial-numerical associations in human participants	S34: Understanding variability and developmental pathways in mathematics anxiety	S35: Early mathematics interventions: Co-design, implementation, and effectiveness

THURSDAY JUNE 25

	Room A+B: Psico 3	Room T1: CLA	Room T2: CLA	Room T3: CLA	Room T4: CLA
8:00-9:00 ***BUISNESS MEETING***	***MCLS BUISNESS MEETING***				
9:00-10:15 ***Symposia***	S36: Assessing early mathematics: Psychometric and measurement evidence across contexts and learners	S37: Emergence of geometric intuitions: the role of experience, sensory modalities, and numerical skills	S38: "When I grow up, I want to do math!": affective-motivational factors in math-related careers and targeted interventions	S39: Understanding mathematics in children with special educational needs: variability, classroom support, and intervention	S40: Parents' beliefs and practices in children's math learning
10:15-10:45	**Coffee Break**				
10:45-12:15 ***Individual Talks***	IT11: Individual Talks	IT12: Individual Talks	IT13: Individual Talks	IT14: Individual Talks	IT15: Individual Talks
12:15-1:15	**Lunch: Campus main square**				
1:15-2:00 ***Posters & Lightning Symposia***	**Poster Session 5: CLA building, first floor** LS9: Developmental cascades from early childhood math to early adulthood outcomes				
2:00-3:15 ***Symposia***	S41: The motor-cognitive architecture of mathematical learning	S42: The Brain behind the Numbers: Neuroimaging insights into Schooling, Number processing, Dyscalculia, and Math Anxiety	S43: Early mathematical cognition in different contexts. Assessment and interventions in early childhood education	S44: The potential of digital educational learning activities to support pupils' learning processes of different math skills in classrooms	S45: Investigations into improving fraction understanding: From foundational research to lasting practical applications
3:15-3:45	**Coffee Break**				
3:45-5:00 ***Symposia***	S46: Cognitive and emotional factors in ageing: Implications for numerical processing and functional numeracy	S47: Complexities in the order processing literature	S48: Identifying and helping dyscalculic learners	S49: The brain goes to school: Neural correlates of mathematical learning in the ages 4-7	S50: The double-edged role of parents' math attitudes: pathways to children's emotions, motivation, and performance
5:00-5:30	**Conclusive Remarks: Room A+B Psico3**				

WELCOME

On behalf of the MCLS Governing Board, I am thrilled to welcome you to the ninth annual MCLS meeting. This year, we recognize the 10th anniversary of the Society's formal recognition in December 2015. It is particularly fitting to meet in Padova, which has a long tradition of research in numerical cognition. As our society continues to expand, we remain committed to broadening our global reach and connecting with researchers in regions of the world where MCLS has not yet had the opportunity to gather. To achieve this goal, we encourage our members to consider hosting a future conference at their home institution. The strong participation in this year's conference is a testament to the vitality and dynamism of our community. Our community is grounded in a strong commitment to scientific rigor, ethical conduct, and open science practices. As our field and society evolve, our Journal has experienced a steady increase in submissions, prompting us to expand our efforts to support the timely dissemination of high-quality research. We are also exploring new ways to improve accessibility for our members and to advance our commitment to interdisciplinary and transdisciplinary research spanning psychology, education, neuroscience, and many other fields. Please join us at our Business Meeting to learn more and share your ideas. We encourage you to take full advantage of the many opportunities for interaction offered throughout the conference, including workshops, symposia, and poster sessions. May these sessions help you build new connections and collaborations across disciplines, institutions, career levels, and countries. Please consider becoming involved in the society's work through the Governing Board, Executive Board, or MCLS Trainee Board, and help shape the future of our community. We hope that MCLS 2026 provides a welcoming environment for stimulating scientific discussion, meaningful professional connections, and memorable social experiences.

Ilaria Berteletti

Chair of the MCLS

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to the Department of General Psychology (DPG) and the Department of Developmental and Social Psychology (DPSS) of the University of Padova for their continuous support throughout the organization of this conference. Their assistance with administrative procedures, technical services, and institutional coordination, together with their generous financial support for the pre-conference events, has played a key role in making this conference possible.

We are also grateful to the Polo di Psicologia and the School of Psychology of the University of Padova for their logistical support and for helping provide a welcoming environment for all participants throughout the conference.

A special thank you goes to the team of student and postdoctoral volunteers, whose enthusiasm and commitment have been invaluable at every stage of the organization. From the early planning phases to on-site assistance during the conference, they generously contributed their time and energy to ensuring the smooth running of the event.

We are also grateful to our presenters, symposium organizers, and session chairs for sharing their expertise, fostering stimulating discussions, and contributing to the scientific quality of the conference.

Finally, we would like to thank all the participants who joined us with such enthusiasm and engagement. Their presence, contributions, and active participation have made this edition the largest in the history of the MCLS.

GENERAL INFORMATION

Conference Programme

A digital version of this Programme Booklet and the Book of Abstracts can be found at https://www.the-mcls.org/conferences/mcls-2026-padua.

Registration/Check-in

Check-in takes place in the ground floor of Psico 3 building. The registration table will act as a point of assistance throughout the conference. Registration will open on June 22 from 3 pm to 6 pm during the preconference event and will continue on June 23 from 8:15 onwards.

Wi-Fi Access

Wi-Fi is available anywhere on campus. You may use Eduroam.

Quiet Room

A quiet room is reserved in CLA building, first floor, for anyone wishing to wind down and separate from the bustling halls of the conference. These are NOT rooms for conversations, video conferencing, or making phone calls. Please respect the needs of those who want to study, read, or enjoy quiet time.

Lactation Room

A private room is available at the first floor in the CLA building. If needed, a refrigerator is also available at the fifth floor of the CLA building, in the dining area. Please ask the staff at the registration table to show you the location of both the lactation room and the refrigerator. You will be responsible for ensuring your items left in the fridge are clearly recognizable and for retrieving anything by the end of the conference.

Map

A campus map is located at the end of this program.

Accessibility

Each classroom is equipped with a computer connected to the internet for any online connection that may be needed, and it is set up with live captions to ensure accessibility. Should you prefer to use your own computer, we kindly ask for your full cooperation in setting up a live captioning system and in ensuring that there are no delays in the event of audio-video connection problems.

If a microphone is in the room, please use it to ensure accessibility. **Please arrive 20 minutes before your session for proper setup before starting**. Ideally, session chairs should coordinate everyone's presentations.

Slide/Poster Upload

All presenters have acknowledged that uploading slides/ posters before your presentation is required 48 hours ahead of time. This will ensure optimal access for individuals preferring to use personal devices to read the materials ahead of time.

If not already done, **presenters are to upload their slides/posters using the QR codes and links below**. The same links and QR codes can be used to view the materials.

Please find the appropriate folder and timeslot matching your presentation.

June 23
https://rebrand.ly/60b000

June 24
https://rebrand.ly/5e5f0c

June 25
https://rebrand.ly/ffaa72

Lunches and Coffee Breaks

Lunch and coffee breaks are provided during the conference. There are morning and afternoon coffee breaks with different options. Tables with food will be located in the outdoor campus square.

Please note that there will be vegan, gluten-free and dairy-free options. The list of ingredients will be made available. We ask individuals with dietary restrictions to collect a dedicated sticker at the registration desk: this will allow the catering staff to give priority and assistance.

Poster Hall

Poster sessions are held in the CLA building, first floor. Each poster board has a number and a room, please find your poster number and room in the booklet as your dedicated board space.

To facilitate the smooth running of the conference, posters scheduled for the morning session may be displayed at any time up to 20 minutes before the session begins. Likewise, posters for the afternoon session may be put up from the end of the previous poster session onwards.

We kindly ask presenters to remove their posters at the end of each session, so as to allow easy access for colleagues presenting in the following sessions. All materials needed for mounting the posters will be available in the rooms.

Getting Around

The conference will be held on the campus of the School of Psychology at the University of Padua, located between the three departmental buildings and within a short distance from the train station and city center. The University promotes various initiatives to enhance the sustainable mobility of our university in urban areas by collecting ideas, opinions and proposals from its student and staff community: https://www.unipd.it/en/muoversi-padova.

Parking on Campus

There are limited free parking possibilities in the streets north of the venue. For other possibilities, please visit the car parking information page of the City of Padova:

https://www.comune.padova.it/elenco-parcheggi-citta.

Conference Reception 06/23

The conference reception is on Tuesday, 23 June, in the outdoor campus square from 5:45 pm to about 7:30 pm (refreshments are included).

Mentoring Lunch 06/23

The MCLS Trainee Board is excited to invite you to the Mentoring Lunch at 12:15 PM on Tuesday, June 23, in the campus main square.

This event is designed to allow attendees to connect with their mentor, mentee, or buddy. During the event, attendees are encouraged to partner with another mentoring pair to share experiences, learn from each other, and build professional relationships. The goal is to create an inclusive and welcoming environment for all attendees, so please don't hesitate to contact us if you have any questions.

MCLS Business Meeting 06/25

All MCLS members are invited to join the business meeting on Thursday, 25 June, 8:00 am to 9:00 am in Room A+B, Psico 3 building.

Trainee Social Event 06/24

All trainees are warmly invited to join the MCLS Trainee Social Event at 7:30 PM on Wednesday, June 24. The exact location will depend on the weather and will be confirmed during the conference. Free drinks and snacks will be provided for trainees, but all conference participants are very welcome to join us. If you have any questions about the Trainee Social Event, please feel free to contact the organizers:

Maria Silvia Saccani (mariasilvia.saccani@unipd.it)

and Sara Noacco (sara.noacco@phd.unipd.it).

Certificate of Attendance

At the end of this booklet, you can find your certificate of attendance. Should you need a certificate with your name for your institution, please email mcls2026padova@gmail.com. For the payment

confirmation of the registration and conference fee, please contact:

mathcognitionlearningsociety@gmail.com.

Things to Do

Main attractions include Palazzo del Bo, the University's historic seat, the Basilica of Saint Anthony, the Scrovegni Chapel with Giotto's frescoes, and the Botanical Garden, the oldest in the world and a UNESCO World Heritage site. Padua is easily accessible by train or plane, with the nearest airport in Venice. The city offers a wide range of accommodations and shopping opportunities.

Padova offers a variety of shopping options. Corso Italia features fashion boutiques and international brands. Every Saturday, Prato della Valle hosts a lively open-air market with fresh and local products. In the city center, the “Mercato Sotto il Salone” is the oldest covered market in Europe. Via San Fermo offers antique shops and art galleries, while nearby outlet malls such as McArthurGlen provide discounted designer brands.

Additionally, Padova is ideally located for visiting nearby cities. Venice is only about 30 minutes away by train. Vicenza, famous for the Renaissance architecture of Andrea Palladio, can be reached in about 15-20 minutes. Verona, known for the story of Romeo and Juliet and for its Roman Arena, is about 45-60 minutes away. Bologna is roughly 50 minutes away, Florence can be reached in about 1 hour and 40 minutes, and Milan in about 2 hours.

SYMPOSIA

S1: A cross-linguistic perspective on numerical cognition

Tue, 23 Jun 2026, 09:00-10:15 | A+B Psico 3

Chairs:

Nicolas Masson
UCLouvain, Belgium

Mila Marinova
KU Leuven, Belgium

• Learning the logic of counting in a multilingual environment
Christine Schiltz[1], Mila Marinova[2]
1 University of Luxemburg, Luxemburg
2 KU Leuven, Belgium

• The effect of language transparency on the development of base-ten comprehension
Cloé Geuquet[1], Nicolas Masson[1], Bert De Smedt[2], Mai-Liên Lê[3], Marie-Pascale Noël[1]
1 UCLouvain, Belgium
2 KU Leuven, Belgium
3 University of Social Sciences and Humanities, Vietnam National University

• Environmental contributors to early numerical development: A comparison between South Africa and the UK
Mojtaba Soltanlou[1], Elizaveta Ivanova[2], Parvin Nemati[3], Elizabeth Henning[3]
1 University College London
2 University of Surrey
3 University of Johannesburg, South Africa

• The role of decimal number word structures in magnitude processing
Iro Xenidou-Dervou[1], Katie Smith[1], Julia Bahnmueller[1], Camilla Gilmore[1], Marta Mielicki[2], Lorien Peeters[3], Xenia Vamvakoussi[4], Wim Van Dooren[3]
1 Loughborough University, United Kingdom
2 Centre for Education Research and Innovation, SRI International, USA
3 KU Leuven, Belgium
4 University of Ioannina, Greece

S2: Developmental Dyscalculia - bridging research and practice

Tue, 23 Jun 2026, 09:00-10:15 | T1 - CLA

Chair:

Ursina McCaskey
University Children's Hospital Zurich, Switzerland

• Sense of time skills in children with Developmental Dyscalculia: a categorical and dimensional approach
Federica Cortesi[1], Valentina Tobia[2]
1 Faculty of Psychology, Vita-Salute San Raffaele University, Milan, Italy
2 Faculty of Psychology, Vita-Salute San Raffaele University, Milan, Italy; San Raffaele Hospital, Milan, Italy

• Neural underpinnings of magnitude and spatial processing in children with Developmental Dyscalculia
Ursina McCaskey[1], Samira Zurbrügg[1], Eileen Bruderer[1], Ruth O'Gorman Tuura[1], Karin Kucian[1]
1 Center for MR-Research, University Children's Hospital Zurich, Switzerland

• Uncover the realities of adult Dyscalculia
Leyre Gambra[1], Flavia H. Santos[2]
1 Department of Education, Faculty of Education and Psychology, University of Navarra, Spain
2 University College London, Institute of Education, UK

• Dyscalculia – How to bridge the gap between research and practice
Leonie Holste[1], Silvia Brem[2], Karin Kucian[3], Simone Schwizer[3], Sarah Di Pietro[2]
1 University Research Priority Project (URPP): Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
2 Department of Child and Adolescent Psychiatry and Psychotherapy, University Hospital of Psychiatry Zurich, University of Zurich, Switzerland
3 Center for MR-Research, University Children's Hospital Zurich, Switzerland

S3: Long-term memory for numerical information: New perspectives on the relationship between long-term memory and mathematical skills

Tue, 23 Jun 2026, 09:00-10:15 | T2 - CLA

Chair:

Michał Obidziński
Jagiellonian University in Krakow, Poland

Discussant:

Jean-Philippe van Dijck
Thomas More University of Applied Sciences, Antwerpen, Belgium; Ghent University

• Beyond rote retrieval: a unified fuzzy-trace framework for numerical memory

Nina Bażela[1], Michał Obidziński[2], Kinga Szafron[2], Krzysztof Cipora[2], Mateusz Hohol[2]
1 Jagiellonian University in Krakow, Poland; Doctoral School in the Social Sciences, Jagiellonian University in Krakow, Poland
2 Jagiellonian University in Krakow, Poland

• Counting on compensation: Cognitive aging affects hemispheric lateralization underlying arithmetic fact retrieval from memory

Lisa Moreel[1], Robin Gerrits[2], Wim Fias[1]
1 Ghent University
2 MPI Cognitive and Brain Sciences, Leipzig

• Relationship between long-term memory for sentences with and without numbers in the context of fuzzy-trace theory

Michał Obidziński[1], Nina Bażela[2], Kinga Szafron[1], Mateusz Hohol[1]
1 Jagiellonian University in Krakow, Poland
2 Jagiellonian University in Krakow, Poland; Doctoral School in the Social Sciences, Jagiellonian University in Krakow, Poland

S4: Exploring order processing: mechanisms, strategies, and mathematical development

Tue, 23 Jun 2026, 09:00-10:15 | T3 - CLA

Chair:
Jessica Maisey
Loughborough University, United Kingdom

• Evaluating the associations between ordering abilities and number line estimation strategies

Michael Slipenkyj[1], Taeko Bourque[1], Charles Anifowose[2], Heather Douglas[1], Rebecca Merkley[1], Jo-Anne LeFevre[3]
1 Department of Cognitive Science, Carleton University
2 Vretta Inc.
3 Department of Cognitive Science and Department of Psychology, Carleton University

• Not just memory retrieval: order production predicts performance on a curriculum-based mathematics task better than order verification

Jessica Maisey[1], Kinga Morsanyi[1], Georgios Thoma[2], Korbinian Moeller[3]
1 Loughborough University, United Kingdom
2 University of Reading, United Kingdom
3 Loughborough University, United Kingdom; UMIT-Tirol Private University for Health Science and Technology, Austria; University of Tübingen, Germany

Statistical learning and mathematics: are different domains and modalities of statistical learning related to numerical ordering and geometry?

Michelle Janssens[1], Liv Smets[2], Eleonore Smalle[3], Arnaud Szmalec[4], Bert Reynvoet[1]
1 Department of Brain and Cognition, Faculty of Psychology and Educational Sciences, Katholieke Universiteit Leuven, Belgium; Faculty of Psychology and Educational Sciences, Katholieke Universiteit Leuven, Kulak, Belgium
2 Psychological Sciences Research Institute, Université catholique de Louvain, Belgium
3 Department of Developmental Psychology, Tilburg School of Social and Behavioral Sciences, Tilburg University, Netherlands
4 Psychological Sciences Research Institute and Institute of Neuroscience, Université catholique de Louvain, Belgium; Department of Experimental Psychology, Faculty of Psychology and Educational Sciences, Ghent University, Belgium

• Three-six-nine, something doesn't align: understanding ordinal processing abilities across different contexts

Olivia Shyiak[1], Jedd Santos[1], Stephanie Bugden[1], Brandon Goulding[1]
1 University of Winnipeg, Canada

S5: Perceiving and processing empty sets as zero: evidence from fish, chicks, preschoolers and adults

Tue, 23 Jun 2026, 09:00-10:15 | T4 - CLA

Chairs:
Silvia Benavides-Varela
Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy; Padova Neuroscience Center, University of Padova, Padova, Italy

Giulia Vigna
Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy

• Emergence and maturation of numerosity encoding and early representation of zero in the zebrafish brain

Mirko Zanon[1], Giorgio Vallortigara[1]
1 Center for Mind/Brain Sciences (CIMeC), University of Trento, Rovereto, Italy

• Early zero-like concept in day-old domestic chicks

Rosa Rugani[1], Luna Dudine[2], Silvia Benavides-Varela[3], Annamaria Porru[2], Lucia Regolin[1]
1 Department of General Psychology, University of Padova, Padova, Italy
2 Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy
3 Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy; Padova Neuroscience Center, University of Padova, Padova, Italy

• Proto-arithmetic abilities with empty sets in preschoolers
Giulia Vigna[1], Annamaria Porru[1], Daniela Lucangeli[1], Lucia Regolin[2], Rosa Rugani[2], Silvia Benavides-Varela[3]
1 Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy
2 Department of General Psychology, University of Padova, Padova, Italy
3 Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy; Padova Neuroscience Center, University of Padova, Padova, Italy

• When nothing is something: the unexpected resilience of processing empty sets as zero
Rut Zaks-Ohayon[1], Serena Mingolo[2], Joseph Tzelgov[3], Michal Pinhas[2]
1 Brain-IL the national brain stimulation institute, The Mental Health Medical Center, Beer Sheva; Joyce & Irving Goldman Medical School, Ben-Gurion University of the Negev, Beer Sheva, Israel
2 Department of Psychology, Ariel University, Israel
3 Department of Psychology, and Zlotowski Center for Neuroscience, Ben-Gurion University of the Negev, Beer Sheva; Department of Cognitive and Brain Sciences, Ben-Gurion University of the Negev, Beer Sheva, Israel

S6: Does math anxiety undermine learning? Developmental pathways, threat responses, and disengagement across different learners

Tue, 23 Jun 2026, 14:00-15:15 | A+B Psico 3

Chairs:
Sara Caviola
Department of Developmental and Social Psychology, University of Padova, Italy

Monica Melby-Lervag
Department of Special Needs Education, University of Oslo, Norway; CREATE-Centre for Research on Equality in Education, University of Oslo, Norway

• The developmental dynamics between math anxiety and math skills: examining three theories
Arne Lervåg[1], Hedda N. Wahl[2], Enrica Donolato[3], Monica Melby-Lervag[4]
1 CREATE-Centre for Research on Equality in Education, University of Oslo, Norway
2 Department of Education, University of Oslo, Norway
3 Faculty of Psychology, Sigmund Freud University, Vienna, Austria
4 Department of Special Needs Education, University of Oslo, Norway; CREATE-Centre for Research on Equality in Education, University of Oslo, Norway

• Math anxiety and math skills development in children: a longitudinal study on early predictors
Enrica Donolato[1], Hedda N. Wahl[2], Monica Melby-Lervag[3], Arne Lervåg[4]
1 Faculty of Psychology, Sigmund Freud University, Vienna, Austria
2 Department of Education, University of Oslo, Norway
3 Department of Special Needs Education, University of Oslo, Norway; CREATE-Centre for Research on Equality in Education, University of Oslo, Norway
4 CREATE-Centre for Research on Equality in Education, University of Oslo, Norway

• Math anxiety and social-evaluative threat across neurodevelopmental disorders
Rachele Lievore[1], Riccardo Pagan[1], Irene C. Mammarella[1], Sara Caviola[1]
1 Department of Developmental and Social Psychology, University of Padova, Italy

• Developing and Validating a Scale for Mathematics Avoidance
Nathan T.T. Lau[1], Moriah Sokolowski[2], Michael Slipenkyj[3], Sophia Mackeigan[2]
1 Department of Psychology, University of Macau, China
2 Department of Psychology, Toronto Metropolitan University, Canada
3 Department of Cognitive Science, Carleton University, Canada

S7: Perspectives on mathematical cognition from Latin America

Tue, 23 Jun 2026, 14:00-15:15 | T1 - CLA

Chairs:
Silvia Benavides Varela
Università degli Studi di Padova

Alejandro Maiche
Universidad de la República

Discussant:
Flavia Santos
University College of London

• Variability matters: home math environments and early mathematics performance in chile
María Ines Susperreguy[1], Marigen Narea[1], Carolina Alvarez[2]
1 Pontificia Universidad Católica de Chile, Centro de Estudios Avanzados sobre Justicia Educacional, Chile
2 University of Cambridge, United Kingdom

• Mathematics anxiety and academic performance: a study in cuban schoolchildren
Nancy Estévez Pérez[1], Lena María Crespo Díaz[1], Ursina McCaskey[1], Karin Kucian[2]
1 Cuban Neuroscience Center, Cuba
2 University Children's Hospital Zurich, Switzerland

• Remediation strategies for learners with developmental dyscalculia: a five-axis framework
Silvia Figiacone[1]
1 NeuroEduca, Argentina

S8: From early numerical representations to arithmetic skills: insights into mathematical learning difficulties

Tue, 23 Jun 2026, 14:00-15:15 | T2 - CLA

Chairs:

Maëlle Neveu
University of Mons, Belgium

• Early cardinal representations in preterm children: the role of sensorimotor abilities.
Laurence Rousselle[1], Auriane Leclercq[1], Renaud Viellevoye[2], Line Vossius[1], Maëlle Neveu[3]
1 University of Liège, Belgium
2 Citadelle Hospital, Belgium
3 University of Mons, Belgium

• Transcoding in children with math learning difficulties
Marie Pascale Noël[1]
1 UCLouvain, Belgium

• Arithmetic abilities in children with corpus callosum agenesis
Alice Boutros[1], Jérôme Prado[2], Catherine Thevenot[1]
1 University of Lausanne, Switzerland
2 University of Lyon, France

• Embodied vs non-embodied strategies for teaching addition beyond ten in second-grade students
Virginie Crollen[1], Dounia Al Jabiri-Berger[1], Isaline Cols[1], Clara Requena-Sanchez[1], Cathy Marlair[1]
1 UCLouvain, Belgium

S9: Number concept acquisition in young children

Tue, 23 Jun 2026, 14:00-15:15 | T3 - CLA

Chair:

Rebecca Merkley
Carleton University, Canada

Discussant:

Hanna Weiers
Loughborough University, UK

• What predicts early number acquisition? Evidence from a causal number word training paradigm
Pierina Cheung[1]
1 National Institute of Education, Singapore

• The role of inhibitory control and working memory in number word knowledge
Andrew Ribner[1], Melissa Libertus[2]
1 Chatham University
2 University of Pittsburgh

• A diary study of a toddler's number word acquisition
Rebecca Merkley[1], Liza Kahwaji[1], Leah Marshall[1], Jo-Anne LeFevre[1]
1 Carleton University

S10: The nature and mechanisms of numerosity perception

Tue, 23 Jun 2026, 14:00-15:15 | T4 - CLA

Chair:

Michele Fornaciai
University of Trieste, Italy

• Unveiling the psychophysical properties of the number sense
Roberto Arrighi[1]
1 University of Florence

• Late cortical dynamics mediate the symmetry-induced numerosity illusion
Elisa Castaldi[1]
1 University of Florence

• The dynamic nature of numerosity perception
Michele Fornaciai[1]
1 University of Trieste

• Cross-dimension serial dependence effects between numerosity and duration
Irene Togoli[1]
1 University of Trieste

S11: Sensorimotor foundations of numerical cognition

Tue, 23 Jun 2026, 15:45-17:00 | A+B Psico 3

Chairs:

Giovanni Anobile
University of Florence, Italy

Arianna Felisatti
University of Padua, Italy

Discussant:
Giovanni Anobile
University of Florence, Italy

• Embodied numbers: new sensory signatures and motor marks
Martin H. Fischer[1], Arianna Felisatti[2]
1 Department of Psychology, University of Potsdam, Potsdam, Germany
2 University of Padua, Italy

Spontaneous eye movements reveal altered cognitive maps of numbers in adults with dyscalculia
Paula A. Maldonado Moscoso[1], Simone Viganò[2], Manuela Piazza[1]
1 Center for Mind/Brain Sciences, University of Trento, Rovereto, Italy
2 Cognitive Neuroimaging Unit, INSERM, CEA, DRF/Joliot, Université Paris Saclay, NeuroSpin center, Gif/Yvette, France

• Children's mental calculation is uniquely supported by the non-symbolic sensorimotor number sense
Giovanni Anobile[1], Silvia Martelli[1], Eleonora Bieber[2], Francesca Tinelli[2], Sofia Ditano[1]
1 Department of Neuroscience, Psychology, Pharmacology and Child Health, University of Florence, Florence, Italy
2 Department of Developmental Neuroscience, IRCCS Fondazione Stella Maris, Pisa, Italy

• Embodied number processing across the lifespan: insights from behavioural and fNIRS research
Maria S. Saccani[1], Sara Noacco[1], Elena Nava[2], Michelle Giraud[2], Giovanna Mioni[3], Simone Cutini[4], Sabrina Brigadoi[4], Mariagrazia Ranzini[3]
1 Department of General Psychology, University of Padua, Padua, Italy
2 Department of Psychology, University of Milan-Bicocca, Milan, Italy
3 Department of General Psychology, University of Padua, Padua, Italy
4 Department of Developmental Psychology and Socialization, University of Padua, Padua, Italy

S12: Developing flexibility in mathematical problem-solving

Tue, 23 Jun 2026, 15:45-17:00 | T1 - CLA

Chairs:
Haoyi Wang
University of Toronto, Canada

Qiuyu Chen
University of Michigan, USA

• Improving flexibility in algebra problem-solving through comparing and discussing multiple strategies
Haoyi Wang[1], Qiuyu Chen[2], Jon R. Star[3]
1 University of Toronto, Canada
2 University of Michigan, USA
3 Harvard University, USA

• Impact of a short intervention in multidigit arithmetic on students' flexibility and adaptivity in multidigit arithmetic
Lóa Björk Jóelsdóttir[1], Pernille Bødtker Sunde[1], Helena Skyt Nielsen[2]
1 VIA University College, Denmark
2 Aarhus University, Denmark

• Effects of a pre-algebra equation-solving intervention for students with mathematics learning difficulties
Xiangyu Li[1], Xin Lin[2]
1 Southwest University, China
2 University of Macau, Avenida da Universidade, Macau, China

• Spontaneous attention to quantitative relations: Individual differences and malleability in mathematics learning
Hongyang Zhao[1], Ella Rose[2], Banu Karyagdi[2], Maryam Cheraghi[2], Ebrar Aslaner[3], Shuyuan Yu[2], Lindsey Richland[2]
1 University of Illinois, Urbana-Campaign, USA
2 University of California, Irvine, USA
3 Boğaziçi University, Türkiye

S13: Randomised control trials: from theory to practice in improving mathematical skills

Tue, 23 Jun 2026, 15:45-17:00 | T2 - CLA

Chair:
Lopez-Pedersen Anita
Department of Special Needs Education, University of Oslo, Norway

Discussant:
David Purpura
Department of Human Development and Family Science, Purdue, USA

• Evaluating the effectiveness of a numerical transcoding training programme to enhance mathematical skills: a randomised controlled trial
Ella James-Brabham1[1], Raneem Haddad[1], Natasha Guy[1], Franz Wortha[1], Julia Bahnmueller[1], Gaia Scerif[2], Silke M. Göbel[3]
1 Centre for Mathematical Cognition, Loughborough University, UK
2 Department of Experimental Psychology, University of Oxford, UK
3 Department of Psychology, University of York, UK; Centre for Research on Equality in Education (CREATE), University of Oslo, Norway

• **Improving reading and mathematical skills through a combined intervention: A multi-site randomized trial**

Vibeke Rønneberg[1], Tonje Amland[2], Monica Melby-Lervåg[3], Oddny J. Solheim[4], Arne O. Lervåg[5], Sigrun K. Ertesvåg[6], Anita Lopez-Pedersen[7]

1 Department of Education, National Centre for Reading Education and Research, University of Stavanger, Norway
2 Department of Special Needs Education, University of Oslo; CREATE - Centre for Research on Equality in Education, University of Oslo, Norway
3 Department of Special Needs Education, University of Oslo, Norway; CREATE - Centre for Research on Equality in Education, University of Oslo, Norway
4 Department of Education, Knowledge Centre for Education, University of Stavanger, Norway
5 Department of Education, University of Oslo, Norway;CREATE - Centre for Research on Equality in Education, University of Oslo, Norway
6 Department of Education, Norwegian Centre for Learning Environment and Behavioral Research in Education, University of Stavanger, Norway
7 Department of Special Needs Education, University of Oslo, Norway

• **Complex interventions call for complex models: A Multi-Level Analysis of Child, Context, and Implementation Moderators in a Play-Based Maths and Executive Function Early Years Programme**

Gaia Scerif[1], Rosemary O'Connor1[1], Zachary Hawes[2], Steven Howard[3], Liza Kahwaji[4], Rebecca Merkley[5], Victoria Simms[6], Emma Blakey[7]

1 Department of Experimental Psychology, University of Oxford, UK
2 Department of Applied Psychology and Human Development, University of Toronto, Canada
3 Early Start and School of Education, University of Wollongong, Australia
4 Department of Cognitive Science, Carleton University, Canada
5 Department of Psychology, Stanford University, USA
6 Centre for Mathematical Cognition, Loughborough University, UK
7 School of Psychology, University of Sheffield, UK

S14: Mathematics anxiety across the lifespan: Bridging developmental and contextual perspectives.

Tue, 23 Jun 2026, 15:45-17:00 | T3 - CLA

Chair:

Serena Rossi
Loughborough University, United Kingdom

• **Individual differences in a dual-task: the impact of anxiety on arithmetic with and without verbal interference.**

Serena Rossi[1], Krzysztof Cipora[2], Sara Caviola[3], Irene Cristina Mammarella[3], Iro Xenidou-Dervou[1]

1 Loughborough University, UK
2 Jagiellonian University, Poland
3 University of Padova, Italy

• **Investigating the role of math anxiety and ratio processing system in symbolic fraction comparison: A cross-cultural study of American and Chinese children.**

Xiaotong Yi[1], Connie Barroso[1], Zhe Wang[1]

1 Texas A&M University, US

• **Developmental directionality between math achievement and math anxiety in primary school.**

Jean-Philippe van Dijck[1], Jolien Moorkens[2], Wim Fias[3]

1 Thomas Moore, Belgium; Ghent University, Belgium
2 Leiden University; The Netherlands, Ghent University, Belgium; Thomas More, Belgium
3 Ghent University, Belgium

• **Mathematics anxiety outside of Educational Contexts: The development of a new scale.**

Ciara Turner[1], Krzysztof Cipora[2], Serena Rossi[1], Kinga Morsanyi[1]

1 Loughborough University, UK
2 Jagiellonian University, Poland

S15: Understanding dysfluency in arithmetic: early indicators, persistence, and intergenerational pathways

Tue, 23 Jun 2026, 15:45-17:00 | T4 - CLA

Chairs:

Sara Huotari
University of Jyväskylä, Finland

Matilda Hamara
University of Jyväskylä, Finland

• **Early numeracy profiles of preschoolers at risk of mathematical learning difficulties predict their arithmetic and reading skills in grade 1**

Sara Peteers[1], Kelly Trezise[2], Robert Reeve[2], Sean Kang[2], Lorraine Graham[2], Bert De Smedt[3]

1 KU Leuven and University of Melbourne
2 University of Melbourne
3 KU Leuven

• **Early longitudinal predictors of dysfluency in arithmetic**

Sara Huotari[1], Riikka Heikkilä[2], Mikko Aro[1], Minna Torppa[1], Karin Landerl[3], Juho Polet[1], Paavo Leppänen[1], Tuire Koponen[1]

1 University of Jyväskylä
2 Niilo Mäki Institute
3 University of Graz

• **Identifying predictors of persistent arithmetic fluency difficulties across early school years**
Matilda Hamara[1], Minna Torppa[1], Riikka Heikkila[2], Eija Räikkönen[1], Tuire Koponen[1]
1 University of Jyväskylä
2 Niilo Mäki Institute

• **Cognitive mechanisms underlying intergenerational transmission of math skills**
Lotta Sieppi[1], Jenni Salminen[1], Tuire Koponen[1], Eija Räikkönen[1], Kaisa Lohvansuu[1], Minna Torppa[1]
1 University of Jyväskylä

S16: Beyond number: Cross-domain interactions of numerical and quantitative information

Wed, 24 Jun 2026, 09:00-10:15 | A+B Psico 3

Chair:
Gisella Decarli
Department of Human Sciences, Link Campus University, Italy

Discussant:
Gisella Decarli
Department of Human Sciences, Link Campus University, Italy

• **Crossing the boundary: no catastrophic limits on infants' capacity to represent linguistic sequences**
Natalia Reoyo-Serrano[1], Anastasia Dimakou[2], Chiara Nascimben[1], Tamara Bastianello[1], Daniela Lucangeli[1], Silvia Benavides-Varela[3]
1 Department of Developmental Psychology and Socialisation, Padova University
2 Padova Neuroscience Center, Padova University
3 Department of Developmental Psychology and Socialisation, Padova University
Padova Neuroscience Center, Padova University

• **Space in time - What can the temporal momentum effect teach us about the role of space as a representational medium for quantity information?**
André Knops[1], Marie Jacquel[1]
[1] Université Paris Cité, LaPsyDÉ, CNRS, France

• **Motion-numerical compatibility affects magnitude classification: Evidence from head movements**
Vittoria Volpi[1], Carlotta Isabella Zona[2], Martin H. Fischer[2]
1 University of Paris Cité
2 Potsdam Embodied Cognition Group, University of Potsdam

• **Predictive attentional shifts during arithmetic problem solving: Evidence from eye movements**
Nicolas Masson[1], Mauro Pesenti[1], Christine Schiltz[2], Michael Andres[1]
1 Psychological Sciences Research Institute, Université catholique de Louvain, Belgium
2 Institute of Cognitive Science and Assessment (COSA), Department of Behavioural and Cognitive Sciences (DBCS), Faculty of Humanities, Education and Social Sciences (FHSE), University of Luxembourg, Luxembourg

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S17: Beyond main effects in early mathematics: contextual and behavioral moderators

Wed, 24 Jun 2026, 09:00-10:15 | T1 - CLA

Chairs:
Yi Shen
The Education University of Hong Kong, Hong Kong S.A.R., China

Sivan Lurie
University of Maryland, College Park

• **Mathematics interest and performance: the role of home mathematics environment**
Yi Shen[1], Valerie Yi Jie He[1], Nicholas A. Vest[2], Jenny Yun-Chen Chan[1]
1 The Education University of Hong Kong
2 University of Florida

• **When the going gets tough: parental praise during challenging preschool math activities**
Sivan Lurie[1], Ayelet Unguru[1], Geetha Ramani[1]
1 University of Maryland, College Park

• **Learning-related behaviors moderate the working memory-math link in Chinese kindergartners**
Leran Meng[1], Jenny Yun-Chen Chan[1], Kerry Lee[2]
1 The Education University of Hong Kong
2 Yew Chung College of Early Childhood Education

• **The relations between spatial reasoning, executive functioning, and mathematics performance: a meta-analysis**
Yuxin Zhang[1], Rebecca Bull[1], Emma C. Burns[1], Carola Ruiz Hornblas[2], Signe M. Duff[1]
1 Macquarie University
2 Catholic University of Uruguay

S18: Spatial skills as a foundation for mathematics: development, diversity, and educational impact

Wed, 24 Jun 2026, 09:00-10:15 | T2 - CLA

Chair:
Eylül Turan
University of Washington, United States of America

• Early verbal and non-verbal spatial skills as precursors of mathematical development
Eylül Turan[1], Claudia Wimsatt[1], Alice Aizza[1], Ariel Starr[1]
1 University of Washington

• Who can benefit from spatial skills in mathematics and when?
Ilse Coolen[1], Gaia Scerif[2], Bert De Smedt[3]
1 University of Leuven, University of Oxford
2 University of Oxford
3 University of Leuven

• The association between children's socioeconomic status, their spatial abilities and later mathematics proficiency
Sarah McCarthy[1], Debbie Gooch[2], Michael S.C. Thomas[3], Angelica Ronald[2], Emily K. Farran[1]
1 University of Surrey; Centre for Educational Neuroscience
2 University of Surrey
3 Birkbeck University of London, Centre for Educational Neuroscience

• Mathsburst in Scotland: primary school maths lessons with deliberate spatial instruction lead to spatial, maths and computational thinking gains
Jack Parkinson[1], Quintin Cutts[1]
1 Turner Kirk Centre for Spatial Reasoning, University of Glasgow

S19: Math anxiety through the lens of intervention studies: Developmental and classroom insights among elementary schoolers

Wed, 24 Jun 2026, 09:00-10:15 | T3 - CLA

Chair:
Terhi Vessonen
Southern Methodist University, United States of America

• "Brave like a lion": Insights from a pilot intervention treating math anxiety in elementary school
Olivia K. Cook[1], Colleen M. Ganley[1], Zahra Maghami Sharif[1], Sally Cole[1], Nandrea Burrell[1], Emma Doyle[1], Federica Granello[2], Matthew Viverito[1], Christy Allen[1], Alexandria Meyer[3], Sara A. Hart[4], Maria Chiara Passolunghi[2]
1 Florida State University
2 University of Trieste
3 Santa Clara University
4 University of Waterloo

• Reducing math anxiety by relaxation and multiplication training in elementary school classrooms: An intervention study
Pinja Tähti[1], Hans Lehikoinen[2], Anna Tapola[3], Johan Korhonen[3], Riikka Mononen[2]
1 University of Helsinki
2 University of Oulu
3 Åbo Akademi University

• Feeling more in control: Reducing math anxiety through a multiplication intervention aimed at improving students' self-efficacy in math
Ellen Sammallahti[1], Jonatan Finell[2], Bert Jonsson[2], Johan Korhonen[1]
1 Åbo Akademi University
2 Umeå University

• A longitudinal examination of math anxiety profiles throughout a math intervention
Kimia Akhavein[1], Terhi Vessonen[1], Joanne Joo[1], Leanne Ketterlin Geller[1], Erica Lembke[2], Sarah Powell[3]
1 Southern Methodist University
2 University of Missouri
3 University of Texas at Austin

S20: SNARC: universality within and between subjects and new methodological advances

Wed, 24 Jun 2026, 09:00-10:15 | T4 - CLA

Chair:
Federico D'Atri
University of Trieste, Italy

• Is a calculation prodigy more like a mathematician or a typical individual in the SNARC effect?
Mateusz Hohol[1], Krzysztof Cipora[1], Katharina Sautter[2], Venera Gashaj[3], Gert Mittring[4], Klaus Willmes[5]
1 Jagiellonian University in Krakow, Poland
2 University of Tübingen, Germany
3 University of Teacher Education in Special Needs: Zürich, CH
4 Institut für Diagnostik und Beratung, Bonn, Germany
5 RWTH Aachen University

• Towards the temporal dynamics of numerical cognition: the SNARC effect is robust against embodied influences when tested at a single moment in time
Kinga Szafron[1], Krzysztof Cipora[1], Mateusz Hohol[1]
1 Jagiellonian University in Krakow, Poland

• How automatic is number processing in professional mathematicians? The SNARC effect in a color judgment task
Lilly Roth[1], Martyna Sroka[2], Michał Obidziński[2], Michaela Meier[3], Roland H. Grabner[3], Mariagrazia Ranzini[4], Lucrezia Guiotto Nai Fovino[4], Krzysztof Cipora[2], Mateusz Hohol[2]
1 University of Tübingen, Germany
2 Jagiellonian University in Krakow, Poland
3 University of Graz, Austria
4 University of Padua, Italy

• Powering up cognitive research: comparing methods for detecting and estimating the SNARC effect
Federico D'Atri[1], Mateusz Hohol[2], Carlo Fantoni[1], Lilly Roth[3], Leonardo Egidi[1], Krzysztof Cipora[2]
1 University of Trieste, Italy
2 Jagiellonian University in Krakow, Poland
3 University of Tübingen, Germany

S21: When numbers take sides: The conditional nature of symbolic and non-symbolic spatial-numerical associations in humans

Wed, 24 Jun 2026, 14:00-15:15 | A+B Psico 3

Chair:
Oliver Harrison
Loughborough University, United Kingdom

Discussant:
Krzysztof Cipora
Jagiellonian University

• Spatial-numerical associations for non-symbolic numerosities depend on stimuli characteristics: A pre-registered study
Oliver Harrison[1], Francesca De Vita[2], Korbinian Moeller[3], Silke M. Göbel[4], Francesco Sella[1]
1 Department of Mathematics Education, Centre for Mathematical Cognition, Loughborough University
2 Department of Chemistry and Physics, University of Palermo, Italy
3 Institute of Psychology, UMIT-Tirol Private University for Health Sciences and Technology, Hall in Tyrol, Austria; Department of Mathematics Education, Centre for Mathematical Cognition, Loughborough University; LEAD Graduate School and Research Network
4 Department of Psychology, University of York, United Kingdom

• No observable SNARC effect with numbers in a nonsymbolic format
Attila Krajsci[1], Gábor Lengyel[2]
1 Department of Cognitive Psychology, Institute of Psychology, ELTE Eötvös Loránd University
2 Department of Cognitive Science, Central European University; Department of Brain and Cognitive Sciences, University of Rochester

• Role of the joint use of spatial and magnitude codes in the spatial representation of number magnitude: Empirical evidence and critical review of counter-evidence
Fabrizio Doricchi[1], Silvana Lo Presti[1], Stefano Lasaponara[1]
1 "Sapienza" Universita' di Roma – Fondazione Santa Lucia IRCCS Roma – Italy

S22: The link between math language and math skills in varying contexts

Wed, 24 Jun 2026, 14:00-15:15 | T1 - CLA

Chair:
Elyssa Geer
Anita Zucker Center for Excellence in Early Childhood Studies, University of Florida, United States of America

Mary DePascale
University at Albany, SUNY

• "Let's put one cube in each of them": The role of individual and contextual factors in parent-child math and spatial language
Julie Kim[1], Mary DePascale[2]
1 Brazelton Touchpoints Center, Boston Children's Hospital
2 University at Albany, SUNY

• Domain-specific relations between math and spatial language and skills
Elyssa Geer[1], Brianna Devlin[2], Lauren Westerberg[3], Tracy Zehner[4], Irem Korucu[5], Lindsay Bryant[6], David Purpura[7], Robert Duncan[8], Sara Schmitt[4]
1 Anita Zucker Center for Excellence in Early Childhood Studies, University of Florida
2 University at Buffalo, Learning and Instruction
3 University of Wisconsin-Madison, Center for Education Research
4 Prevention Science Institute, University of Oregon
5 Department of Psychology, Florida Atlantic University
6 Clifton Larson Allen
7 Department of Human Development and Family Science, Purdue University
8 Colorado State University

• Effects of a co-constructed interactive shared reading-based teaching intervention on mathematics language and mathematics in preschoolers and kindergarteners aged 3 to 6
Anne Lafay[1], Sonia Angonin[2], Mélodie Bulinski[1], Clémence Roseau[1], Carole Berger[1]
1 Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, LPNC, France
2 Education Nationale, France

• Effects of quantitative and spatial language storybook interventions in preschool
Patrick Ehrman[1], Lauren Westerberg[2], Yemimah King[3], Brianna Devlin[4], Sophie Miller[1], David Purpura[1]
1 Purdue University, Human Development and Family Science
2 University of Wisconsin-Madison, Center for Education Research
3 Georgia State University, Early Childhood and Elementary Education
4 University at Buffalo, Learning and Instruction

S23: Beyond maths anxiety: The developmental origins of mathematics-related emotions and their consequences in adults

Wed, 24 Jun 2026, 14:00-15:15 | T2 -CLA

Chair:
Kinga Morsanyi
Loughborough University, UK, United Kingdom

• The emergence of children's emotions toward math in the preschool years
Carlo Tomasetto[1], Maria Chiara Liverani[2], Rebecca Pignatti[1], Chiara Sanasi[1], Eleni Kalagirou[2], Édouard Gentaz[2]
1 University of Bologna
2 University of Geneva

• The interplay of gender ability beliefs, mathematics anxiety, and mathematics performance in early primary education
Romee Halidu[1], Elske Salemink[2], Brenda Jansen[1], Michiel Veldhuis[3]
1 University of Amsterdam
2 Utrecht University
3 IPABO Amsterdam, Utrecht University

• Mathematics avoidance: The development and validation of a self-report scale
Kinga Morsanyi[1], Caterina Primi[2]
1 University of Loughborough
2 University of Florence

• Psychometric properties of the Adult Mathematics Avoidance Questionnaire
Caterina Primi[1], Laura Di Leonardo[1], Kinga Morsanyi[2], Maria Anna Donati[1]
1 University of Florence
2 University of Loughborough

S24: The emergence and cognitive foundations of early symbolic math skills

Wed, 24 Jun 2026, 14:00-15:15 | T3 - CLA

Chair:
Tuire Koponen
University of Jyväskylä, Finland

Discussant:
Melissa Libertus
University of Pittsburgh

• The impact of object sets on children's early understanding of numbers
Camilla Gilmore[1], Sohnia Ghattaura[1], Victoria Simms[1], Hanna Weiers[1]
1 Centre for Mathematical Cognition, Loughborough University

• The association between number concept knowledge and cognitive skills among 2.5-year-olds
Tiina Ronkainen[1], Jenni Salminen[1], Piia Parviainen[1], Minna Torppa[2], Tuire Koponen[1]
1 Department of Education, University of Jyväskylä
2 Department of Teacher Education, University of Jyväskylä

• Early math vocabulary knowledge and related cognitive skills among 2.5-year-olds
Tuire Koponen[1], Jenni Salminen[1], Kaisa Lohvansuu[2], Piia Parviainen[1], Tiina Ronkainen[1], Kenneth Eklund[1], Minna Torppa[2]
1 Department of Education, University of Jyväskylä
2 Department of Teacher Education, University of Jyväskylä

S25: Diverse pathways to improving elementary mathematics learning: daily routines, tutoring, and digital tools across contexts

Wed, 24 Jun 2026, 14:00-15:15 | T4 - CLA

Chair:

Siling Guo
University of California, Irvine, United States of America

• Evaluating the effectiveness and transfer effects of Number Talks in upper elementary students: evidence from Uruguay
Nadir Díaz-Simón[1], Pablo Araújo[2], Alejandro Maiche[2], Daniel Ansari[1]
1 Western University
2 Universidad de la República

• Scaling daily math routines: a cluster-randomized trial of Number Talks professional development and Math Club in elementary schools
Siling Guo[1], Karajean Hyde[1], Drew Bailey[1]
1 University of California, Irvine

• Reading and cognitive predictors of responsiveness to a word-problem intervention
Sarah Powell[1]
1 University of Texas at Austin

• Making the most out of digital educational interventions: an example with the Math Island, a gamified digital intervention targeting numeracy-related cognitive skills
Terry Tin-Yau Wong[1]
1 University of Hong Kong

S26: Not all play is equal: Playful math interventions for preschool and elementary-age children

Wed, 24 Jun 2026, 15:45-17:00 | A+B Psico 3

Chair:
Geetha B. Ramani
University of Maryland, College Park, United States of America

Meredith Rowe
Harvard University

• Three book-reading interventions for preschoolers' spatial and mathematical learning
Elizabeth A. Gunderson[1], Hyekyung Park[1], Nadia S. Tavassolie[2], Xinhe Zhang[1], Marissa Brown[3], Molly Griffin[3], Noah Scott[4], Lexi Sylverne[5], Emily D'Antonio[6], Amanda Grenell[7], Nora S. Newcombe[2], Mary Wagner[3]
1 Indiana University Bloomington
2 Temple University
3 University of Dayton
4 University of Iowa
5 Rutgers University
6 West Virginia University
7 University of Tampa

• Families count: A home-based intervention to enhance parents' math communication and preschoolers' number knowledge
Geetha B. Ramani[1], Gillian Grose[2], Sivan Lurie[1], Maylee Montagut Ascanio[1], Ninie Asad[1], Qianru Tiffany Yang[3], Zhongyu Wei[4], Meredith Rowe[4]
1 University of Maryland, College Park
2 Brazelton Touchpoint Center, Boston Children's Hospital
3 Shanghai Jiao Tong University
4 Harvard University

• Leveraging a patterning lens in a modified board game to enhance kindergarteners' numeracy knowledge
Shang (Irene) Li[1], Elida Laski[2], Emily Fyfe[3], Shakira Abdul-Rauf[1], Aaron Dustin[2], Bethany Rittle-Johnson[1]
1 Vanderbilt University
2 Boston College
3 Indiana University Bloomington

• Executive functions in a playful math learning context: Evidence from Fraction Ball
Lourdes M. Acevedo-Farag[1], John Louis-Strakes Lopez[2], Kreshnik N. Begolli[1], Katherine T. Rhodes[1], Lindsey E. Richland[1], June Ahn[1], Andres S. Bustamante[1]
1 University of California, Irvine
2 University of California, Berkeley

S27: Word-problem problems? No problem! Problem-solving strategies for supporting students experiencing mathematics difficulty

Wed, 24 Jun 2026, 15:45-17:00 | T1 - CLA

Chair:
Katherine Berry
The University of Texas at Austin, United States of America

• Single-step word problems within Pirate Math Equation Quest Intervention translated into Turkish
Asuman Sağlam Ak[1]
1 Eskisehir Osmangazi University

• Multi-step word problems within Pirate Math Equation Quest Intervention
Katherine Berry[1]
1 The University of Texas at Austin

• Math SPIRAL (Specialized Intervention to Reach All Learners): A professional learning-coaching model for

improving word-problem outcomes for educators and students
Gracie Douglas[1]
1 The University of Texas at Austin

• **Long-term gains from mathematical word-problem solving interventions among elementary schoolers: A meta-analysis**
Terhi Vessonen[1], Pirjo Aunio[1], Anu Laine[2]
1 The University of Helsinki
2 University of Helsinki

S28: Spatial numerical associations: Development, culture and biological roots

Wed, 24 Jun 2026, 15:45-17:00 | T2 - CLA

Chairs:
Rosa Rugani
Department of General Psychology,University of Padua, Padua, Italy

Valter Prpic
Department of Theoretical and Applied Sciences, eCampus University, Novedrate, Italy

Arianna Felisatti
Department of General Psychology,University of Padua, Padua, Italy

• **Bridging biology and experience: the drivers of spatial-numerical associations in non-verbal models**
Arianna Felisatti[1], Rosa Rugani[1]
1 Department of General Psychology,University of Padua, Padua, Italy

• **Ordinality and spatial-numerical association in animals: from day-old wild chicks to understudied pigs**
Kimberly Brosche[1], Ariane Veit[2], Matteo Macchinizzi[1], Filippo Gambarota[3], Marianne Wondrak[4], Gianmarco Altoé[3], Rosa Rugani[1]
1 Department of General Psychology,University of Padua, Padua, Italy
2 Messerli Research Institute, University of Veterinary Medicine Vienna, Medical University of Vienna, University of Vienna, Austria
3 Department of Developmental Psychology and Socialisation, University of Padua, Italy
4 Gut Aiderbichl, Berg 20, 5302 Henndorf am Wallersee, Austria

• **Transforming independent experiences into serial hierarchies: framing neuronal correlates of serial order reasoning**
Emiliano Brunamonti[1]
1 “Sapienza” University of Rome

• **From culture to biology: investigating how task demands influence spatial-numerical associations**
Elena Eccher[1], Manuela Piazza[1], Giorgio Vallortigara[1]
1 CIMeC, University of Trento

S29: When numbers speak: Linguistic structure in numerical cognition

Wed, 24 Jun 2026, 15:45-17:00 | T3 - CLA

Chairs:
Roman Janssen
Université Paris Cité

Laurine Milon
Université Paris Cité

Discussant:
Roman Janssen
Université Paris Cité

• **Units first or tens first: How home language affects two-digit auditory-visual number matching in multilinguals**
Angélique Volfart[1], Rémy Lachelin[2], Christine Schiltz[1]
1 University of Luxembourg
2 UniDistance Suisse; University of Luxembourg

• **The French base-20 number word system’s influence on numerical cognition**
Roman Janssen[1], André Knops[1], Arnaud Viarouge[1], Elise Klein[1]
1 Université Paris Cité

• **Language modulates number processing speed but not compatibility effects in French speakers**
Laurine Milon[1], Roman Janssen[1], Maxi Christa Sasso-Sant[2], Stefanie Jung[2], Elise Klein[1]
1 Université Paris Cité
2 Trier University of Applied Sciences

• **A hierarchical representation of multi-digit numbers**
Dror Dotan[1]
1 Tel Aviv University

S30: Pathways through which socializers’ math anxiety relates to children’s math achievement

Wed, 24 Jun 2026, 15:45-17:00 | T4 - CLA

Chairs:
Can Çarkoğlu
University of Chicago, United States of America

Discussant:
Sarah H. Eason
Purdue University

• Messages around math learning: Do certain groups of parents communicate different themes when helping with math?
Can Çarkoğlu[1], Sanah Kochar[2], Fraulein Retanal[3], Erin A. Maloney[3], Robert J. Duncan[4], Laura C. Bofferding[2], Michael M. Barger[5], David J. Purpura[2], Sarah H. Eason[2]
1 University of Chicago, United States of America
2 Purdue University
3 University of Ottawa
4 Colorado State University
5 University of Georgia

• How can I help? Interactions between parents and children in a math homework-helping task
Fraulein Retanal[1], Diya Kamineni[1], Elora Wales[1], Jean-Francois Bureau[1], Jo-Anne LeFevre[2], Helena P. Osana[3], Sheri-Lynn Skwarchuk[4], Erin A. Maloney[1]
1 University of Ottawa
2 Carleton University
3 Concordia University
4 University of Winnipeg

• Examining relations among child- and teacher-reported classroom error climate, teacher math anxiety, and child math anxiety among math anxious children
Colleen M. Ganley[1], Lillian Van Sleen[1], Olivia K. Cook[1], Zahra Maghami Sharif[1], Federica Granello[2], Amanda Jansen[3], Alexandria Meyer[4], Maria Chiara Passolunghi[2], Sara A. Hart[5]
1 Florida State University
2 University of Trieste
3 University of Delaware
4 Santa Clara University
5 University of Waterloo

S31: Strategy flexibility and adaptivity across development, instruction, and cognitive domains

Wed, 24 Jun 2026, 17:45-19:00 | A+B Psico 3

Chair:
Stijn Van Der Auwera
University of Leuven

Discussant:
Camilla Gilmore
Loughborough University

• Strategy flexibility in finger counting depending on the size of the operands
Jeanne Bagnoud[1], Marie Krenger[2], Catherine Thevenot[2]
1 University of Cologne
2 University of Lausanne

• Flexibility and adaptivity with arithmetic – teacher beliefs and practices. A comparison across three countries
Joanne Eaves[1], Stijn Van Der Auwera[2], Marian Hickendorff[3]
1 Loughborough University
2 University of Leuven
3 Leiden University

• A cross-sectional examination of strategy adaptivity: From task-specific to domain-general?
Stijn Van Der Auwera[1], Patrick Lemaire[2], Bert De Smedt[1]
1 University of Leuven
2 Aix-Marseille University

S32: From arithmetic foundations to rational number reasoning: Developmental trajectories and difficulties

Wed, 24 Jun 2026, 17:45-19:00 | T1 - CLA

Chair:
Sabrina Di Lonardo Burr
University of Sheffield, United Kingdom

• Capturing the interconnected development of whole number arithmetic operations using a network approach
Chang Xu[1], Sabrina Di Lonardo Burr[2], Shuyuan Yu[3], Jo-Anne LeFevre[4], Hongxia Li[5], Jiwei Si[5], Yudan Wang[5], Siyao Wu[5]
1 Queen's University Belfast
2 University of Sheffield
3 University of California, Irvine; Carleton University
4 Carleton University
5 Shandong Normal University; Shandong Provincial Key Laboratory of Brain Science and Mental Health

• A fraction of the difficulty: Rapid consolidation of decimal magnitude versus persistent fraction bias
Sabrina Di Lonardo Burr[1], Chang Xu[2], Hongxia Li[3], Jiwei Si[3], Mengru Qiu[3], Hongting Ly[3]
1 University of Sheffield
2 Queen's University Belfast
3 Shandong Normal University; Shandong Provincial Key Laboratory of Brain Science and Mental Health

• **Developmental trajectory of nonsymbolic proportional comparison skills from fourth to eighth grade**
Roberto A. Abreu-Mendoza[1], Arthur B. Powell[2], Elizabeth A. Gunderson[1], Miriam Rosenberg-Lee[2]
1 Indiana University Bloomington
2 Rutgers University, Newark

• **Operating under assumptions: an investigation into answer accuracy, operation choice, and showing work for fraction word problems**
Guba Taylor-Paige[1], Nancy Dyson[1], Nancy Jordan[1]
1 University of Delaware

S33: Exploring new perspectives on spatial-numerical associations in human participants

Wed, 24 Jun 2026, 17:45-19:00 | T2 - CLA

Chairs:
Valter Prpic
eCampus University

Rosa Rugani
University of Padova

• **A graded model of automaticity for spatial-numerical associations: semantic processing of both spatial and numerical codes determines robust effects**
Valter Prpic[1]
1 Department of Theoretical and Applied Sciences, eCampus University

• **Numerosity, spatial and visual cues shape center identification in number-line bisection across development**
Annamaria Porru[1], Daniela Lucangeli[1], Lucia Regolin[2], Rosa Rugani[2], Silvia Benavides-Varela[3]
1 Department of Developmental and Social Psychology, University of Padova
2 Department of General Psychology, University of Padova
3 Department of Developmental and Social Psychology, University of Padova; Padova Neuroscience Center, University of Padova

• **Culture shapes the spatial representation of speed and time**
Mario Dalmaso[1], Michele Vicovaro[2]
1 Department of Developmental and Social Psychology, University of Padova
2 Department of General Psychology, University of Padova

• **Effects of number magnitude on spatial decisions: spatial–numerical associations in complex motor behavior**
Mauro Murgia[1], Angelica Ielo[1], Stefano Pileggi[1], Valter Prpic[2], Cathy Craig[3], Tiziano Agostini[1], Fabrizio Sors[1]
1 Department of Life Sciences, University of Trieste
2 Department of Theoretical and Applied Sciences, eCampus University
3 School of Psychology, Ulster University

S34: Understanding variability and developmental pathways in mathematics anxiety

Wed, 24 Jun 2026, 17:45-19:00 | T3 - CLA

Chair:
Sylvia Gattas
University College London, Institute of Education, United Kingdom

• **The Big AMAS database – a (hopefully) useful reference item-level dataset of mathematics anxiety scores worldwide**
Krzysztof Cipora[1], Mateusz Hohol[1], Sara Caviola[2]
1 Jagiellonian University in Krakow, Poland
2 University of Padova, Italy

• **Understanding the link between error sensitivity and math anxiety**
Alison Williams[1], Krzysztof Cipora[2], Serena Rossi[1], Julia Bahnmueller[1]
1 Loughborough University, United Kingdom
2 Jagiellonian University in Krakow, Poland

• **The role of Visuospatial Working Memory, Maths Self-Concept and Maths Anxiety in predicting Maths Performance in Primary School Children**
Aoife Durkan[1], Flavia Santos[2]
1 University College Dublin, School of Psychology, Ireland
2 University College London, Institute of Education, UK

• **Autonomic regulation as a developmental precursor to mathematics anxiety**
Sylvia Gattas[1], Danielle Soriano[2], Vivian Sava[3], Alex Fraser[4], Kylie Li[4], Bethan Grimes[4], Devanshi Trivedi[4], Julia Dabrowska[4], Wesley Moon[4], Weren Talbot-ponsonby[4], Gaia Scerif[4]
1 University of Oxford, University College London, Institute of Education
2 College of the Holycross, University of Oxford
3 American University, University of Oxford
4 University of Oxford

S35: Early mathematics interventions: Co-design, implementation, and effectiveness

Wed, 24 Jun 2026, 17:45-19:00 | T4 - CLA

Chairs:
Mary DePascale
University at Albany, SUNY

Nicole Scalise
Washington State University

• Support early mathematics with Little Shopper's Journey: The role of relational language and number relation scaffolding
Valerie Yi Jie He[1], Jenny Yun-Chen Chan[1], Nicole Scalise[2]
1 The Education University of Hong Kong
2 Washington State University

• Co-producing and assessing the feasibility and acceptability of a home mathematics intervention
Vic Simms[1], Emma Blakey[2], Abbie Cahoon[3], Ben Hunt[4], Ella James-Brabham[1], Danielle Matthews[2], Emma Smith[2]
1 Loughborough University
2 University of Sheffield
3 Ulster University
4 Sheffield Hallam University

• The effectiveness of early math interventions: A pre-registered meta-analysis
Mary DePascale[1], Nicole Scalise[2], Aryn Vaughan[2], Yilin Liu[3]
1 University at Albany, SUNY
2 Washington State University
3 Boston College

• Mathematics difficulty as a moderator of early numeracy intervention
Taylor Lesner[1], Gena Nelson[1], Peter Boedeker[2]
1 University of Oregon
2 Baylor College of Medicine

S36: Assessing early mathematics: Psychometric and measurement evidence across contexts and learners

Thu, 25 Jun 2026, 09:00-10:15 | A + B Psico 3

Chair:
Jimena Cosso
University of Maryland, United States of America

• Growing pains: The development of numeracy screeners for Canadian students
Jo-Anne LeFevre[1], Michael Slipenkyj[2], Heather Douglas[2], Ayushi Chitranshi[2], Taeko Bourque[2], Mitch Haslehurst[3], Charles Anifowose[3], Sarah Kelly[2], Rebecca Merkley[2]
1 Department of Cognitive Science, Carleton & 2. Department of Psychology, Carleton University University
2 Department of Cognitive Science, Carleton University
[3] Vretta Inc.

• Ensuring consistency over time: Longitudinal measurement invariance and predictive validity of FUNA-jr in grade 2
Heidi Hellstrand[1], Timi Niemensivu[2], Anu Laine[3], Johan Korhonen[1], Pirjo Aunio[3]
1 Faculty of Human and Social Sciences, Åbo Akademi University, Vaasa, Finland
2 Turku Research Institute for Learning Analytics, University of Turku, Turku, Finland
3 Faculty of Educational Sciences, University of Helsinki, Helsinki, Finland

• Two is better than one: The factor structure of geometry skills
David J. Purpura[1], Lauren Westerberg[2], Eylül Turan[3], Sara A. Schmitt[4]
1 Purdue University
2 University of Wisconsin
3 University of Washington
4 University of Oregon

• Does assessment language matter? Evidence from a randomized study of math performance in dual language learners
Jimena Cosso[1], Giancarlo Visconti[1]
1 University of Maryland

S37: Emergence of geometric intuitions: the role of experience, sensory modalities, and numerical skills.

Thu, 25 Jun 2026, 09:00-10:15 | T1 - CLA

Chairs:
Elise Rombaux
Institute of Psychology (IPSY), Université Catholique de Louvain, Belgium & Simon Fraser University, British Columbia, Canada

Virginie Crollen
Institute of Psychology (IPSY) and Institute of Neuroscience (IoNS), Université Catholique de Louvain, Belgium

• Parallel contributions of numerical and visuo-spatial systems to geometric intuition
Elise Rombaux[1], Virginie Crollen[2]
1 Institute of Psychology (IPSY), Université Catholique de Louvain, Belgium & Simon Fraser University, British Columbia, Canada
2 Institute of Psychology (IPSY) and Institute of Neuroscience (IoNS), Université Catholique de Louvain, Belgium

• Geometric content of visual forms representations in children and adults
Léa Lefer Paty[1], Penelope Maran[1], Judith Vergne[2], Théo Morfoisse[3], Lucie Martin[1], Ana Durón Tejedor[1], Viviane Huet[1], Maxine Dos Santos[1], Véronique Izard[1]
1 Université Paris Cité, INCC UMR 8002, CNRS, France
2 Université Paris Cité, INCC UMR 8002, CNRS, France & Fédération EPN-R, Université Paris Nanterre, France

3 Université Paris Cité, INCC UMR 8002, CNRS, France & Cognitive Neuroimaging Unit, INSERM, CEA, CNRS, Université Paris-Saclay, NeuroSpin center, France

• **From intuition to deduction: Diagram-based geometric reasoning in children and adults**
Yacin Hamami[1], Marie Amalric[2]
1 Université de Lorraine, Université de Strasbourg, CNRS, AHP-PReST
2 Cognitive NeuroImaging unit, INSERM, CEA, CNRS, Université Paris-Saclay, NeuroSpin center & Laboratory for Developmental Studies, Department of Psychology, Harvard University

• **Visual experience, haptic expertise and geometric intuitions: Evidence from innovative detachable material.**
Léa Langérôme[1], Véronique Izard[2], Virginie Crollen[1]
1 Institute of Psychology (IPSY) and Institute of Neuroscience (IoNS), Université Catholique de Louvain, Belgium
2 Université Paris Cité, INCC UMR 8002, CNRS, F-75006, Paris, France

S38: "When I grow up, I want to do math!": affective-motivational factors in math-related careers and targeted interventions

Thu, 25 Jun 2026, 09:00-10:15 | T2 - CLA

Chairs:
Alessandro Cuder
University of Trieste, Italy

Maristella Lunardon
University of Tuebingen, Germany

Sandra Pellizzoni
University of Trieste, Italy

Maria Chiara Passolunghi
University of Trieste, Italy

• **Mathematics and university choice: different configurations of attitudes and skills**
Maristella Lunardon[1], Krzysztof Cipora[2], Christina Artemenko[1], Hans-Christoph Nuerk[1]
1 University of Tuebingen, Germany
2 Copernicus Center for Interdisciplinary Studies, Jagiellonian University in Cracow, Poland

• **Effect of specialization on elementary school teachers' general math anxiety and their anxiety about teaching math and German**
Frieder L. Schillinger[1], Debora L. Laidig[2]
1 Ludwigsburg University of Education, Ludwigsburg, Germany
2 Ludwigsburg University of Education, Ludwigsburg, Germany; Angelo State University, San Angelo, United States

• **Contribution of affective-motivational factors in middle-school STEM choices: a longitudinal study**
Alessandro Cuder[1], Eleonora Doz[1], Sandra Pellizzoni[1], Maria Chiara Passolunghi[1]
1 Department of Life Sciences, University of Trieste, Trieste, Italy

• **Comparing cognitive and emotional-motivational interventions to enhance word problem-solving skills in elementary school: a randomized controlled study**
Eleonora Doz[1], Alessandro Cuder[1], Sandra Pellizzoni[1], Maria Chiara Passolunghi[1]
1 Department of Life Sciences, University of Trieste, Trieste, Italy

S39: Understanding mathematics in children with special educational needs: variability, classroom support, and intervention

Thu, 25 Jun 2026, 09:00-10:15 | T3 - CLA

Chair:
Stella Xu
University College London, United Kingdom

Discussant:
Jo Van Herwegen
University College London

• **Individual differences and mathematical profiles in Williams syndrome and Down syndrome**
Stella Xu[1], Michael S.C. Thomas[2], Jo Van Herwegen[1]
1 University College London
2 Birkbeck, University of London

• **Improving mathematical skills in children with Down syndrome and Williams syndrome: a feasibility study of symbolic and non-symbolic skills intervention programmes**
Arcelia N.S. Cheung[1], Michael S.C. Thomas[2], Victoria Simms[3], Jo Van Herwegen[1]
1 University College London
2 Birkbeck, University of London
3 Loughborough University

• **Observing mathematics learning experiences for neurodivergent children: cognitive profiles, classroom support, and practice**
Zahra Siddiqui[1], Jennifer C. Bullen[2], Gillian Hughes[2], Katie-Anne Costello[3], Emily K. Farran[3], Gaia Scerif[2], Jo Van Herwegen[4]
1 University College London, University of Oxford
2 University of Oxford
3 University of Surrey
4 University College London

S40: Parents' beliefs and practices in children's math learning

Thu, 25 Jun 2026, 09:00-10:15 | T4 - CLA

Chair:
Siqi Zhang
Purdue University, United States of America

Discussant:
Diana Leyva
University of Pittsburgh, Department of Psychology

• **Relations among parents' ability-related beliefs, their math language, and kindergarteners' math performance**
Siqi Zhang[1], Sarah H. Eason[1], Niyantri Ravindran[2], Zhe Wang[3]
1 Purdue University, Department of Human Development and Family Science
2 University of Georgia, Department of Human Development and Family Science
3 Texas A&M University, Department of Educational Psychology

• **Parental math support and children's numeracy skills in Chinese and U.S. families: Is math anxiety a moderator?**
Qianru Tiffany Yang[1], Eva Sakellakis[2], Juntong Yu[3], Meredith L. Rowe[3], Jing Tian[2]
1 Shanghai Jiao Tong University, School of Education
2 Fordham University, Department of Psychology
3 Harvard University, Graduate School of Education

• **Parents' process responses to failure dampen math anxiety development in low achieving students.**
Zhe Wang[1], Madelyn Molina[1], Nan Hu[1], Minchao Wang[1]
1 Texas A&M University, Department of Educational Psychology

S41: The motor-cognitive architecture of mathematical learning

Thu, 25 Jun 2026, 14:00-15:15 | A+B Psico 3

Chair:
Irene Oeo
KU Leuven, Belgium

• **From action to abstraction: motor control as a scaffold for mathematical cognition.**
Venera Gashaj[1]
[1] University of Teacher Education in Special Needs (HfH), Zurich, Switzerland; Faculty of Psychology, UniDistance Suisse, Brig, Switzerland

• **Co-Development of motor skills, updating and mathematical problem-solving in children aged 3 to 6 years.**
Anssi Vanhala[1], Anna Widlund[2], Johan Korhonen[2], Donna Niemistö[3], Anu Laine[1], Kerry Lee[4], Pirjo Aunio[1]
1 Faculty of Educational Sciences, University of Helsinki, Finland
2 The Faculty of Human and Social Sciences, Åbo Akademi University, Finland
3 Faculty of Sport and Health Sciences, University of Jyväskylä, Finland
4 Yew Chung College of Early Childhood Education, Tin Wan, Hong Kong, People's Republic of China

• **Numerical and geometric cognition in children with developmental coordination disorder: behavioral evidence and early intervention outcomes.**
Alice Gomez[1]
1 Centre de Recherche en Neuroscience de Lyon (CRNL)

• **Numerosity perception and fraction processing in children with developmental coordination disorder.**
Irene Oeo Morín[1], Flore Maricau[2], Fien Depaepe[2], Bert Reynvoet[3]
1 Faculty of Psychology and Educational Sciences, KU Leuven @Kulak, Kortrijk Belgium; Brain and Cognition, KU Leuven, Leuven, Belgium
2 Faculty of Psychology and Educational Sciences, KU Leuven @Kulak, Kortrijk Belgium; Itec, imec research group at KU Leuven, Kortrijk Belgium
3 Faculty of Psychology and Educational Sciences, KU Leuven @Kulak, Kortrijk Belgium; Brain and Cognition, KU Leuven, Leuven, Belgium

S42: The Brain behind the Numbers: Neuroimaging insights into Schooling, Number processing, Dyscalculia, and Math Anxiety

Thu, 25 Jun 2026, 14:00-15:15 | T1 - CLA

Chair:
Karin Kucian
Center for MR-Research, University Children's Hospital Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland

Discussant:
Karin Kucian
Center for MR-Research, University Children's Hospital Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland

• Cortical plasticity in response to formal schooling
Floor Vandecruys[1], Maaike Vandermosten[2], Bert De Smedt[1]
1 Parenting and Special Education Research Unit, KU Leuven, Belgium
2 Experimental ORL, Department of Neurosciences, KU Leuven, Belgium

• Investigating the neural distance and size effects in symbolic and nonsymbolic number comparison: a small-n fmri pilot study
Mikael Skagenholt[1], Kenny Skagerlund[1], Daniel Ansari[2], Jérôme Prado[3], Ulf Träff[1], Attila Krajcsi[4]
1 Linköping University, Department of Behavioral Sciences and Learning, Psychology Division, Sweden
2 University of Western Ontario, Department of Psychology, Canada
3 Lyon Neuroscience Research Center, CNRS, INSERM & University of Lyon, France
4 Eötvös Loránd University, Institute of Psychology, Department of Cognitive Psychology, Hungary

• Cognitive and neural underpinnings of dyscalculia: insights from behavioral modeling and functional connectivity
Maike Renkert[1], Gilles de Hollander[2], Caroline Biegel[3], Sofie Valk[4], Karin Kucian[3], Christian C. Ruff[5]
1 Zurich Center for Neuroeconomics (ZNE), University of Zurich, Switzerland; Center for MR-Research, University Children's Hospital Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
2 Zurich Center for Neuroeconomics (ZNE), University of Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
3 Center for MR-Research, University Children's Hospital Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland
4 Institute for Neuroscience and Medicine, Forschungszentrum Jülich, Jülich, Germany; Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
5 Zurich Center for Neuroeconomics (ZNE) , University of Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland

• Impact of Stress on Math Performance and Neural Activity in Children
Karin Kucian[1], Henri Battenfeld[2], Laura Imhof[2], Olivia Schmid[3], Ursina McCaskey[2], Nancy Estévez Pérez[4], Ruth O'Gorman Tuura[5]
1 Center for MR-Research, University Children's Hospital Zurich, Switzerland; URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland
2 Center for MR-Research, University Children's Hospital Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland
3 Center for MR-Research, University Children's Hospital Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland; University Research Priority Project (URPP): Adaptive Brain Circuits in Development and Learning
4 Neurodevelopment Department, Brain Mapping Division, Cuban Neurosciences Center, Playa, Cuba
5 Center for MR-Research, University Children's Hospital Zurich, Switzerland; Children's Research Center, University Children's Hospital Zurich, Switzerland; Neuroscience Center Zurich, University of Zurich and ETH Zurich, Switzerland

S43: Early mathematical cognition in different contexts. Assessment and interventions in early childhood education.

Thu, 25 Jun 2026, 14:00-15:15 | T2 - CLA

Chair:
Alejandro Maiche
University of the Republic, Uruguay

Maria del Carmen Canto Lopez
Uniiversity of Cadiz, Spain

Josetxu Orrantia
University of Salamanca, Spain

Javier García-Orza
University of Malaga, Spain

• Early mathematical cognition in uruguay: lessons from a nationally grounded assessment tool
Alejandro Maiche[1], Paola García[1], Pablo Araujo[1], Marcela Mena[1]
1 University of the Republic, Uruguay

• Preliminary results on convergent validity between PUMa Spain and TEMA-3 in five-year-old children.
Estrella Velázquez Barbosa[1], María del Carmen Canto López[1], Santiago Reguera Lozano[1], Alejandro Maiche[2], Malena Manchado Porras[1], Estíbaliz Aragón Mendizábal[1], Lydia Mateo Ramos[1], Carlos Mera Cantillo[1], Daniel Cruz Jurado[1]
1 University of Cadiz, Spain
2 University of the Republic, Uruguay

• Mapping skills between symbols, quantities, and finger patterns: a cross-cultural replication in brazilian preschoolers
Nathalia C. Molina[1], Josetxu Orrantia[1], David Múñez[2]
1 University of Salamanca, Spain
2 National Institute of Education, Singapore

• Specific mathematical predictors of digit reading and non-symbolic calculation in kindergarten
Cristina Gutiérrez-Fernández[1], Rocío Lisbona[1], Javier García-Orza[1]
1 Laboratorio de Cognición Numérica. University of Málaga

S44: The potential of digital educational learning activities to support pupils' learning processes of different math skills in classrooms

Thu, 25 Jun 2026, 14:00-15:15 | T3 - CLA

Chair:
Nurit Viesel-Nordmeyer
Aix Marseille University, France

Discussant:
Caroline Hornburg
Learning and Development Lab, Virginia Tech | Human Development and Family Science, Blacksburg

• Evaluating the effectiveness of the Seven Spells digital card game in fourth graders
Flavia Santos[1], Mariuche Gomides[2], Aoife Durkan[3], Sophie J. Leonard[4], Mariana Rocha[5], Pierpaolo Dondio[6]
1 Institute of Education, University College London, UK
2 Universidade Federal de Minas Gerais, Brazil
3 University College Dublin, Ireland; UK
4 Trinity College Dublin, Ireland
5 School of Computer Science, Technological University Dublin, Ireland
6 Department of Computer Science, Maynooth University, Ireland

• The benefit of a digital learning game for children with low multiplication and division skills
Heidi Harju[1], Jarno Rautiainen[1], Markus Hähkiöniemi[2], Tuire Koponen[1]
1 Department of Education, University of Jyväskylä
2 Department of Teacher Education, University of Jyväskylä

Secondary school pupils' problem solving processes while they are using digital learning activities demanding mathematical modeling
Nurit Viesel-Nordmeyer[1], Jean-Francois Herold[1], Rachid Zarouf[1]
1 Aix-Marseille University, Marseille, France

S45: Investigations into improving fraction understanding: From foundational research to lasting practical applications

Thu, 25 Jun 2026, 14:00-15:15 | T4 - CLA

Chair:
Taylor-Paige Guba
University of Delaware, United States of America

• Ratio processing as a foundation for symbolic fractions understanding
Edward Hubbard[1], Isabella Starling Alves[2], Yunji Park[3], Priya Kalra[4], Percival Matthews[1]
1 University of Wisconsin–Madison
2 University of Nebraska–Lincoln
3 Stanford University
4 Western University

• Fraction ball: Iterative, game-based designs to support representational understanding of rational numbers
Lindsey Richland[1], Siling Guo[1], Lourdes Acevedo-Farag[1], Kreshnik Begolli[1], Katherine Rhodes[1], Drew Bailey[1], June Ahn[1], Andres Bustamante[1]
1 University of California–Irvine

• Building fraction sense in sixth grade: Evidence from a randomized controlled trial
Nancy Jordan[1], Taylor-Paige Guba[1], Nancy Dyson[1], Megan Botello[1], Heather Suchanec-Cooper[1]
[1] University of Delaware

• Persistence of intervention effect: fading fast or built to last
Leanne Ketterlin-Geller[1], Erica Lembke[2], Sarah Powell[3], Terhi Vessonen[1], Sam Rikoon[4]
1 Southern Methodist University
2 University of Missouri
3 University of Texas
4 American Institutes for Research

S46: Cognitive and emotional factors in ageing: Implications for numerical processing and functional numeracy

Thu, 25 Jun 2026, 15:45-17:00 | A+B Psico 3

Chair:
Silke M. Wortha
Centre for Early Mathematics Learning, Loughborough University, Loughborough, United Kingdom

• No age-related deficits in place-value processing
Christina Artemenko[1], Mine Avcil[1]
1 Department of Psychology, University of Tuebingen, Germany

• Arithmetic learning throughout adulthood – Cognitive and subjective factors
Katharina Thaler[1], Elisabeth Goettfried[1], Paula Maldonado Moscoso[2], Demis Basso[3], Manuela Piazza[2], Michael Knoflach[1], Margarete Delazer[1], Laura Zamarian[1]
1 Department of Neurology, Medical University Innsbruck, Austria
2 Center for Mind/Brain Sciences, University of Trento, Italy
3 Cognitive and Educational Sciences Lab (CESLab), Faculty of Education, Free University of Bolzano-Bozen, Italy

• How does emotion regulation change effects of emotions on arithmetic performance in young and older adults?
Patrick Lemaire[1], Camille Lallement[1]
1 CNRS, Aix-Marseille Université, Marseille, France

• Math anxiety in later life: Distinct impacts on cognitive interference, health literacy, and financial well-being
Silke M. Wortha[1], Gavin R. Price[2]
1 Centre for Early Mathematics Learning, Loughborough University, Loughborough, United Kingdom
2 Department of Psychology, University of Exeter, United Kingdom

S47: Complexities in the order processing literature

Thu, 25 Jun 2026, 15:45-17:00 | T1 - CLA

Chair:
Declan Devlin
Department of Teacher Education, Norwegian University of Science and Technology (NTNU), Norway

• Putting things in order! A systematic literature review on the ambiguity in descriptions, measurement, and terminology of ordinality
Heidi Harju[1], Jo Van Hoof[2]
1 Department of Teacher Education, University of Turku, Finland
2 Department of Teacher Education, University of Turku, Finland; Turku Research Institute for Learning Analytics, Faculty of Science, University of Turku, Finland

• What do order verification tasks actually measure? A multi-strategy perspective
Declan Devlin[1], Natalia Dubinkina[2], Bert Reynvoet[3], Francesco Sella[4]
1 Department of Teacher Education, Norwegian University of Science and Technology (NTNU), Norway
2 Department of Communication Studies, University of Antwerp, Belgium
3 Brain & Cognition, KU Leuven, Leuven, Belgium; Faculty of Psychology and Educational Sciences, KU Leuven, Kortrijk, Belgium
4 Centre for Mathematical Cognition, Loughborough University, UK

• Neurocognitive mechanisms of numerical order processing and their links to arithmetic ability
Stephan Vogel[1], Clemens Brunner[1], Dennis Wambacher[1], Paul Sedlmayr[1]
1 Talent and Learning Research, Department of Psychology, University of Graz, Austria

• Ordinality is not just counting: Evidence for cardinal-based representations in early childhood
Christian Peake[1], Yovanna Galaz-Nowajewski[2], Felipe Sepúlveda[3]
1 Universidad Diego Portales, Santiago, Chile
2 Universidad Diego Portales, Santiago, Chile; Universidad Alberto Hurtado, Santiago, Chile
3 Universidad Católica de la Santísima Concepción, Concepcón, Chile; Millenniu, Nuceleus for the Science of Learning, Chile

S48: Identifying and helping dyscalculic learners

Thu, 25 Jun 2026, 15:45-17:00 | T2 - CLA

Chair:
Eudald Correig-Fraga
Innovamat Education, Spain

• The nature of dyscalculia
Brian Butterworth[1]
1 University College London

• COSMOS: large-scale mathematics cognition screening for dyscalculia detection
Eudald Correig-Fraga[1]
1 Innovamat Education

• General principles for the design of digital interventions for dyscalculia
Diana Laurillard[1]
1 University College London

• Evaluating digital maths interventions for low-achievers: from number sense to fractions
Marc Colomer-Canyelles[1]
1 Innovamat Education

S49: The brain goes to school: Neural correlates of mathematical learning in the ages 4-7

Thu, 25 Jun 2026, 15:45-17:00 | T3 - CLA

Chair:
Mojtaba Soltanlou
University College London

• Neural correlates of behavioural mastery: a longitudinal fNIRS study of early symbolic numerical knowledge
Elizaveta Ivanova[1], Emily K Farran[1], Mojtaba Soltanlou[2]
1 University of Surrey

2 University College London

• Home numeracy experiences and the developing numerical Brain in early childhood

Cléa Girard[1], Léa Longo[2], Hannah Chesnokova[2], Justine Epinat-Duclos[2], Jérôme Prado[2]
1 Laboratoire de Psychologie et Neurocognition (LPNC), CNRS UMR 5105, Université Grenoble Alpes, France
2 Centre de Recherche en Neurosciences de Lyon (CRNL), INSERM U1028 - CNRS UMR5292, Université de Lyon, France

• Schooling shapes the brain: neural specialization for numbers and words in early childhood

Bert De Smedt[1], Maaike Vandermosten[2], Floor Vandecruys[1]
1 Parenting and Special Education Research Unit, KU Leuven, Belgium
2 Experimental ORL, Department of Neurosciences, KU Leuven, Belgium

• Initial organization and progressive expansion of the math-responsive brain network in children during the first school years

Théo Morfoisse[1], Severine Becuwe[2], Marie Palu[2], Cassandra Potier-Watkins[1], Ghislaine Dehaene-Lambertz[2], Stanislas Dehaene[3]
1 Collège de France, France
2 Cognitive NeuroImaging Unit, CEA, Inserm, Université Paris-Sud, Université Paris-Saclay, NeuroSpin Center, France
3 Collège de France, France; Cognitive NeuroImaging Unit, CEA, Inserm, Université Paris-Sud, Université Paris-Saclay, NeuroSpin Center, France

S50: The double-edged role of parents' math attitudes: pathways to children's emotions, motivation, and performance

Thu, 25 Jun 2026, 15:45-17:00 | T4 - CLA

Chairs:

Federica Granello
University of Trieste, Italy

Colleen M. Ganley
Florida State University, U.S.A.

Maria Chiara Passolunghi
University of Trieste, Italy

Discussant:

Erin Anne Maloney
University of Ottawa, Canada

• Associations among parents' and children's math mindsets and attitudes, and their relations to children's math performance

Caroline Byrd Hornburg[1], Zixin Li[1], Jing Chen[1], Maegan A. Colbert[1], Isabel Valdivia[1]
1 Virginia Tech, U.S.A.

• Parental math-related traits and emotional correlates of highly math-anxious children's emotions and motivation

Federica Granello[1], Maria Chiara Passolunghi[1], Olivia K. Cook[2], Zahra Maghami Sharif[2], Nhu Hin[2], Sara A. Hart[3], Alexandria Meyer[4], Colleen M. Ganley[2]
1 University of Trieste, Italy
2 Florida State University, U.S.A.
3 University of Waterloo, Canada
4 Santa Clara University, U.S.A.

• Parents count too: linking parental math anxiety and interest to the early origins of the math gender gap

Martina Taruscia[1], Alessandro Cuder[1], Marta Candussi[1], Maria Chiara Passolunghi[1], Sandra Pellizzoni[1]
1 University of Trieste, Italy

LIGHTNING SYMPOSIA

LS1: Dyscalculia across the lifespan: Early screening approaches and the consequences of missed diagnosis

Tue, 23 Jun 2026, 13:15-14:00 | A+B Psico 3

Chair:
Alison Roulstone
Centre for Mathematical Cognition, Loughborough University, Loughborough, United Kingdom

• Development of a screening tool for identifying lower primary students at risk for mathematical learning difficulties
Eason Sai-Kit Yip[1], Terry Tin-Yau Wong[1]
1 Department of Psychology, University of Hong Kong, Hong Kong

• Identifying early cognitive and numerical predictors for screening mathematical learning difficulties among kindergarten children
Christine Kong-Yan Tong[1], Terry Tin-Yau Wong[2], Winnie Wai-Lan Chan[1]
1 The Education University of Hong Kong, Hong Kong
2 University of Hong Kong, Hong Kong

• Designing a paper-based, group administered screening tool for early identification of low mathematics achievement
Alison Roulstone[1], Kinga Morsanyi[2], Julia Bahnmueller[2]
1 Centre for Mathematical Cognition, Loughborough University, Loughborough, United Kingdom
2 Centre for Mathematical Cognition, Loughborough University, Loughborough, United Kingdom

• Lingering effects of unidentified dyscalculia – Why early identification matters
Laura Staller[1], Korbinian Moeller[2], Elizabeth Weiss[1], Verena Dresen[1]
1 Institute of Psychology, University of Innsbruck, Austria
2 Institute for Psychology, UMIT, Private University for Health Sciences and Technology, Hall in Tyrol, Austria; and Loughborough University, United Kingdom

LS2: Analyzing specific learning environments to understand mathematical outcomes

Tue, 23 Jun 2026, 13:15-14:00 | T3 – CLA

Chair:
Yoojin Hahn
Teachers College, Columbia University

Evelyn Hsin-I Tsai
Teachers College, Columbia University

Discussant:
Lauren Schiller
Kean University

• Counting what counts: how the structure of counting books shapes reading behaviors and early numerical cognition
Nicole McNeil[1], Chineme Otuonye[1], Connor O'Rear[1], Michelle Luna[1]
1 University of Notre Dame

• Math in the digital age: a playful online family intervention
Gillian Grose[1], Geetha Ramani[2]
1 Boston Children's Hospital
2 University of Maryland, College Park

• How biased distributions of textbook problems shape children's and adults' graph comprehension
Yoojin Hahn[1], Evelyn Hsin-I Tsai[1], Robert Siegler[1]
1 Teachers College, Columbia University

LS3: Sharpening the conceptualization of the home (numeracy) environment

Tue, 23 Jun 2026, 17:00-17:45 | A+B Psico 3

Chair:
Anne H. van Hoogmoed
Radboud University, The Netherlands

Discussant:
Jo van Hoof
University of Turku

• The role of the child and its siblings in the home numeracy environment
Sophie Tesselhof[1], Lien Peters[2], Anne van Hoogmoed[1]
1 Behavioural Science Institute, Radboud University, The Netherlands
2 Ghent University

• A multidimensional assessment of the home learning environment of preschoolers: examining its factor structure
Angie De Lamper[1], Bert De Smedt[1]
1 Parenting and Special Education Research Unit, KU Leuven, Belgium

• Home equal sharing activities and young children's informal fraction skills
Xiao Zhang[1]
1 Faculty of Education, The University of Hong Kong

LS4: Math for real life: rethinking curriculum and intervention through everyday mathematical reasoning

Tue, 23 Jun 2026, 17:00-17:45 | T3 – CLA

Chair:
Linxi Lu
University of Chicago, United States of America

Discussant:
Elida V. Laski
Boston College

• Math in arts and sports: associations between participation in extracurricular activities and early numeracy skills
Qianru Tiffany Yang[1], Yaqi Zhang[2]
1 Shanghai Jiao Tong University
2 New York University Shang Hai

• Whole-number bias and the limits of everyday proportional reasoning in young adults
Linxi Lu[1], Marina Vasilyeva[2], Susan C. Levine[1]
1 University of Chicago
2 Boston College

• How does the ability to comprehend health statistics relate to risk perceptions and behavioral intentions? Findings from three studies of U.S. adults during the COVID-19 pandemic.
Charles J. Fitzsimmons[1], Marta Mielicki[2], Pooja G. Sidney[3], Jennifer M. Taber[4], Karin G. Coifman[4], Clarissa A. Thompson[4]
1 University of North Florida
2 SRI International
3 University of Kentucky
4 Kent State University

LS5: Convergent methodologies in numerical cognition: Computational and neuroscientific perspectives on gender and individual differences

Wed, 24 Jun 2026, 13:15-14:00 | A+B Psico 3

Chair:
Kathleen Casto
Kent State University, United States of America

• A computational cognitive model of number-line completion
Dale Cohen[1], Clarissa Thompson[2], Kathleen Casto[2]
1 University of North Carolina Wilmington
2 Kent State University

• Relations among nlFit parameters, gender, and math anxiety in two samples of U.S. adults
Clarissa Thompson[1], Sam Snyder-Zaborowski[1], Dale Cohen[2]
1 Kent State University
2 University of North Carolina Wilmington

• Hormone-brain correlates of gender effects in magnitude comparison
Kathleen Casto[1], Dale Cohen[2]
1 Kent State University
2 University of North Carolina Wilmington

• Understanding the Domain-Specificity of Executive Functions: Network-level brain mechanisms supporting context-specific processing
Eric Wilkey[1], Alexa Mogan[1]
1 Vanderbilt University

LS6: Mathematics research: Teacher outcomes as critical indicators

Wed, 24 Jun 2026, 13:15-14:00 | T3 – CLA

Chair:
Erica Lembke
University of Missouri, United States of America

Discussant:
Russell Gersten
Instructional Research Group

• Strengthening algebra readiness using data-based individualization: Teacher perceptions
Erica Lembke[1], Sarah Powell[2], Leanne Ketterlin-Geller[3]
1 University of Missouri
2 University of Texas at Austin
3 Southern Methodist University

• **The Early Number Sense Screener Australia (ENSSA): Findings from the 2025 pilot trial and future implementation plans**
Kelly Norris[1], Rebecca Bull[2], Michael Wu[1], Lisa Watts[3], Siobhan Merlo[4]
1 Centre for Independent Studies, Australia
2 Macquarie University, Australia
3 Dyslexia-SPELD Foundation, Australia
4 Educational Consultant, Australia

• **Teacher outcomes in mathematics intervention research: An overlooked dimension**
Christian T. Doabler[1]
1 University of Texas at Austin

• **Math words: The effects of a mathematics vocabulary intervention on the mathematics outcomes of upper elementary students**
Elizabeth A. Stevens[1]
1 University of Texas at Austin

LS7: Capturing the complexity of mathematical cognition beyond the lab: Inclusive research in practice

Wed, 24 Jun 2026, 17:00-17:45 | A+B Psico 3

Chair:
Bethan Grimes
University of Oxford, United Kingdom

• **Studying mathematical cognition beyond the lab: Lessons learnt from school-based EEG research**
Bethan Grimes[1], Sophia Shatek[1], Jaqueline Nakahara[2], Aleeza Dar[1], Gaia Scerif[1], The ONE Team[3]
1 University of Oxford
2 Kings College London
3 University of Oxford, University of Sheffield

• **Reflections on conducting a longitudinal study with 3-year-olds in early years settings**
Hanna Weiers[1], Camilla Gilmore[1], Fiona Leedham[1]
1 Loughborough University

• **Practical and ethical considerations when examining inequalities in children's mathematical skills**
Emma Blakey[1], Molly Willis[1], Molly Jackson[1], Emma Smith[1], Danielle Matthews[1]
1 University of Sheffield

• **Reflecting on strategies for including young neurodivergent children in educational research**
Jennifer Bullen[1], Katie-Anne Costello[2], Zahra Siddiqui[3], Emily Farran[2], Jo Van Herwegen[3], Gaia Scerif[1]
1 University of Oxford
2 University of Surrey
3 University College London

LS8: Game-based Learning as a Tool to Understand and Improve Maths Cognition and Learning

Wed, 24 Jun 2026, 17:00-17:45 | T3 – CLA

Chair:
Pierpaolo Dondio
Dublin City University, Ireland

Discussant:
Pierpaolo Dondio
Dublin City University, Ireland

• **How the introduction of a real-time corrective feedback system in a digital strategy maths game improves and democratizes learning outcomes**
Pierpaolo Dondio[1]
1 Dublin City University

• **Strategy games and problem-solving: analysing backward reasoning**
Marta Barbero[1], Silvia Sbaragli[1]
1 SUPSI

• **How you play the game matters for learning: math anxiety influences how females play an open-ended digital math game**
Dania Carr[1], Susan Levine[1], Pierpaolo Dondio[2]
1 University of Chicago
2 Dublin City University

• **Neural substrates of game-based mathematics learning – a review**
Korbinian Moeller[1], Manuel Ninaus[2], Silke Wortha[1]
1 Loughborough University
2 University of Graz

LS9: Developmental cascades from early childhood math to early adulthood outcomes

Thu, 25 Jun 2026, 13:15-14:00 | A+B Psico 3

Chair:
Yilin (Elaine) Liu
Boston College, United States of America

Discussant:
Melissa Libertus
University of Pittsburgh

• Childhood math and literacy skills as predictors of early adulthood outcomes: Within- and across-domain correlational cascades
Yilin (Elaine) Liu[1], Dr. Eric Dearing[1], Dr. Deborah Vandell[2]
1 Boston College
2 University of California, Irvine

• Mathematics and life course outcomes: Longitudinal relations from early childhood to adulthood
Dr. Jasmine Ernst[1], Patrick Ehrman[2], Dr. David Purpura[2], Dr. Alexa Ellis[3], Dr. Sammy Ahmed[4], Dr. Robert Duncan[5], Dr. Deborah Vandell[6]
1 University of Louisville
2 Purdue University
3 University of Alabama
4 University of Rhode Island
5 Colorado State University
6 University of California Irvine

• Developmental pathways linking preschool math skills to educational and socioeconomic outcomes during adulthood
Dr. Alexa Ellis[1], Dr. Sammy Ahmed[2], Dr. Jasmine Ernst[3], Patrick Ehrman[4], Dr. David Purpura[4], Dr. Deborah Vandell[5]
1 University of Alabama
2 University of Rhode Island
3 University of Louisville
4 Purdue University
5 University of California, Irvine

INDIVIDUAL TALKS

IT1

Tue, 23 Jun 2026, 10:45-12:15 | A+B Psico 3

1. How the brain "sees" number: neural evidence for a visual number sense
Alireza Karami[1], Elisa Castaldi[2], Evelyn Eger[3], Manuela Piazza[4]
1 Neurospin, Centre for Mind/Brain sciences (CIMeC)
2 University of Florence
3 Neurospin
4 Centre for Mind/Brain sciences (CIMeC)

2. ANS signatures in heterogeneous 3D object arrays: limited influence of visual entropy on numerosity perception
Giulio Contemori[1], Ida Bosio[1], Elisabeth Verschure[4], Kuinan Hou[1], Alberto Testolin[1-2], Marco Zorzi[1,3]
1 Department of General Psychology, University of Padua, Italy
2 Department of Mathematics "Tullio Levi-Civita", University of Padua, Italy
3 IRCCS Ospedale San Camillo, Venice-Lido, Italy
4 KU Leuven, Belgium

3. Temporal momentum: a representational bias in performing simple arithmetic with time durations
Mario Bonato[1], Manuel Vencato[1], Marco Zorzi[1-2]
1 University of Padova, Italy
2 IRCCS San Camillo, Lido Venice Italy

4. Mapping Ordinality in Space: A New Method for Non-Symbolic Spatial-Numerical Association and its Links with Mental Rotation and Non-Symbolic Summation
Enrico Sella[1], Matteo Macchinizzi[1], Arianna Felisatti[1], Sara Caviola[2], Erika Borella[1], Rosa Rugani[1]
1 Department of General Psychology, University of Padova, Padova, Italy
2 Department of Developmental Psychology and Socialisation, Padova, Italy

5. The neural bases of graphical perception: a novel instance of cultural recycling?
Lorenzo Ciccione[1], Stanislas Dehaene[2]
1 Paris 8 University, France
2 Collège de France, PSL University, France

6. The compositional nature of number concepts: Insights from number frequencies
Maxence Pajot[1], Mathias Sablé-Meyer[2], Stanislas Dehaene[1-3]
1 Cognitive Neuroimaging Unit, CEA, INSERM, Université Paris-Saclay, NeuroSpin center, France
2 Sainsbury Wellcome Centre for Neural Circuits and Behaviour, University College London, London, UK
3 Collège de France, Université Paris Sciences Lettres (PSL), France

IT2

Tue, 23 Jun 2026, 10:45-12:15 | T1 - CLA

1. Exploring parents' math-related communication in relation to children's arithmetic strategies
Maylee Montagut Ascanio[1], Sivan Lurie[1], Zhongyu Wei[2], Meredith L. Rowe[2], Geetha B. Ramani[1]
1 University of Maryland, College Park
2 Harvard University

2. Does carers' maths anxiety influence children's maths anxiety and maths attainment in the first years of school?
Dawn Sandra Short[1], Janet McLean[1]
1 Abertay University, Dundee, United Kingdom

3. Mathematics anxiety in underrepresented secondary school children: a mixed methods study
Abigail Agyemang[1], Denes Szucs[1], Ros McLellan[1]
1 University of Cambridge, United Kingdom

4. How family stress shapes preschool math: the central role of executive functioning
Jazelle Pilato[1], Joei Camarote[1], Nathaniel Pettit[1], Elizabeth Votrub-Drzal[1], Melissa Libertus[1], Heather J. Bachman[1]
1 University of Pittsburgh, United States of America

5. Electrophysiological correlates of metacognitive monitoring and post-error behavioral adjustments in arithmetic problem solving
Shiva Taghizadeh[1], Eveline Jacobs[2], Elien Bellon[2], Paul Sedlmayr[1], Annika Lemanski[1], Clemens Brunner[1], Roland H. Grabner[1], Bert De Smedt[2], Stephan Vogel[1]
1 University of Graz, Austria
2 KU Leuven, Belgium

6. Pictorial bias in children's interpretations of rates of change
Evelyn Hsin-I Tsai[1], Yuhan Tao[1], Robert Siegler[1]
1 Teachers College, Columbia University, United States of America

IT3

Tue, 23 Jun 2026, 10:45-12:15 | T2 - CLA

1. Development of word problem-solving skills: Language, math, or general cognitive factors?
Monica Melby-Lervåg[1], Anne Mari Høgetveit[2], Esther Canrinus[2], Junyi Yang[1], Arne Lervåg[3]
1 University of Oslo, Department of Special Needs Education, Norway
2 University of Agder
3 University of Oslo, Create, Norway

2. The relations between flexible attention to magnitude ability, domain-general cognitive flexibility, and math achievement
Hyekyung Park[1], Mary Wagner[2], Elizabeth A. Gunderson[1]
1 Indiana University Bloomington
2 University of Dayton

3. Working with numbers and letters: Stimulus domain and cognitive context impact the measurement of executive function
Alexa D. Mogan[1], Kruttika Bhat[2], Nathan T.T. Lau[3], Amelia Murray[4], Eric D. Wilkey[1]
1 Department of Psychology & Human Development, Vanderbilt University, TN, USA
2 Graduate School of Education, Stanford University, CA, USA
3 Faculty of Social Science, University of Macau, China
4 Northwestern University, IL, USA

4. Pathways from spatial skills to mathematics: An eye-tracking study
Ilyse Resnick[1], Jonathan Adams[1]
1 University of Canberra, Australia

5. Beyond math-focused spaces: Caregiver math identity and quantitative versus spatial talk in everyday contexts
Sophie Miller[1], David Purpura[1]
[1] Purdue University, United States of America

6. Generalizing spatial mappings of ordinality: the role of working memory salience and task demands
Elena Albu[1], Lilly Roth[1], Krzysztof Cipora[2], Hans-Christoph Nürk[1]
1 University of Tübingen, Germany
2 Jagiellonian University in Krakow, Poland

IT4

Tue, 23 Jun 2026, 10:45-12:15 | T3 - CLA

1. The componential nature of school mathematics and associative cognitive factors: The case of young children with mathematical learning disabilities
Sarit Ashkenazi[1], Sonia Hassoun[1]
1 The Hebrew University of Jerusalem, Israel

2. Attentional limitations and the demonstration of number knowledge in early learners
Emily Sanford[1], Sarah Sommer[1], Steve Piantadosi[1]
1 University of California, Berkeley, United States of America

3. Numeracy and quality of life: a study conducted with institutionalized individuals with mild to profound intellectual disability
Maëlle Neveu[1], Laurent Lefebvre[1], Audrey Vicenzutto[1], Romina Rinaldi[1]
1 University of Mons, Mons, Belgium

4. More than a math problem: Prevalence and comorbidity of arithmetic difficulties
Nadine Poltz[1], Luisa Wagner[1], Antje Ehlert[1]
1 University of Potsdam, Germany

5. Psychometric properties of a digital tool for detecting risk of difficulties in mathematics learning in early childhood education: a pilot study
Santiago José Reguera Lozano[1], Estíbaliz Aragón Mendizábal[1], Javier García Orza[2], Lydia Mateo Ramos[1], Malena Manchado Porras[1], María del Carmen Canto López[1], Carlos Mera Cantillo[1], Estrella Velázquez Barbosa[1], Daniel Cruz Jurado[1], Hiwet Costa[3]
1 University of Cádiz, Spain
2 University of Málaga, Spain
3 Smartick

6. Winning at the starting line? Latent profiles of math, executive function, and social-emotional skills at kindergarten entry and their association with long-term math trajectories
Mengyan Fang[1], Josh Medrano[1], Dana Miller-Cotto[1]
1 University of California, Berkeley, United States of America

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IT5

Tue, 23 Jun 2026, 10:45-12:15 | T4 - CLA

1. Proportions vs. probabilities in Bayesian reasoning without numbers
Timo Leuders[1], Katharina Loibl[1]
1 University of Education Freiburg, Germany

2. Intuitive interference in proportional reasoning: The role of representation and instruction
David Burstein[1], Reuven Babai[1]
1 Tel Aviv University, Israel

3. Reasoning about what learners know and are ready to learn: why granular models of mathematical knowledge are critical
Anastasia Betts[1], Diana Hughes[1]
1 Learnology Labs, United States of America

4. Sizing up a bias in geometric reasoning: How instructional contexts and visuospatial constraints impact performance
Dominique Lopiccolo[1], Yacin Hamami[2-5], Marie Amalric[5-8], Alon Hafri[1]
1 University of Delaware
2 Université de Lorraine
3 Université de Strasbourg
4 AHP-PReST
5 CNRS
6 INSERM-CEA Cognitive Neuroimaging Unit
7 Université Paris Saclay
8 NeuroSpin

5. Learning to count interferes with proportional reasoning in convolutional neural networks
Miriam Rosenberg-Lee[1], John Morrison[2]
1 Rutgers University, United States of America
2 Barnard College, Columbia University, United States of America

6. Exploring the role of domain-general cognitive skills in the intersection between arithmetic and algebraic thinking
Ulises Xolocotzin[1], Teresa Rojano[1], Ana María Medrano Moya[1]
1 Cinvestav, Mexico

IT6

Wed, 24 Jun 2026, 10:45-12:15 | A+B Psico 3

1. Examining the role of modality in multiplication processing: evidence from deaf early signers and hearing non-signers
Carolyn Gershman[1], Casey Spelman[1], Sarah Kimbley[2], Ilaria Berteletti[1]
1 Visual Language and Visual Learning Center, Gallaudet University
2 School of Speech, Language, and Hearing Sciences, San Diego State University

2. Heightened brain activation to arithmetic task complexity in children over adolescents
Asya Istomina[1], Andrei Faber[1], Andrei Manzhurtsev[2], Maxim Ublinskiy[2], Marie Arsalidou[3]
1 Higher School of Economics
2 Clinical and Research Institute of Emergency Pediatric Surgery and Trauma
3 York University

3. Does expertise modulate automatic arithmetic processing? A stroop paradigm approach
Michaela A. Meier[1], Krzysztof Cipora[2], Roland H. Grabner[1], Lucrezia Guiotto Nai Fovino[3], Mateusz Hohol[2], Michał Obidziński[2], Mariagrazia Ranzini[3], Lilly Roth[4], Martyna Sroka[2]
1 University of Graz, Austria
2 Jagiellonian University in Krakow, Poland
3 University of Padua, Italy
4 University of Tübingen, Germany

4. The automatized counting theory of mental addition: Behavioral evidence from problem size effects
Catherine Thevenot[1], Jérôme Prado[2]
1 University of Lausanne, Switzerland
2 Université de Lyon, France

5. The automatized counting theory of mental addition: Neural evidence
Jérôme Prado[1], Catherine Thevenot[2]
1 University of Lyon, France
2 University of Lausanne, Switzerland

6. Neural and behavioural markers of executive engagement in double-digit magnitude comparison
Sophia M. Shatek[1], Bethan Grimes[1], Ashley Alam[1], Gaia Scerif[1]
1 University of Oxford, United Kingdom

IT7

Wed, 24 Jun 2026, 10:45-12:15 | T1 - CLA

1. Outcomes of an AI-powered digital game-based Intervention: A multimodal perspective
Azilawati Jamaludin[1], Aik Lim Tan[1], Nadhrah Syazwana[1]
1 National Institute of Eduacation, Singapore

2. Effective Components of Mathematics Interventions: Evidence from targeted interventions and machine learning
Jo Van Herwegen[1-2], Michael S.C. Thomas[2-3], Julie Dockrell[1], Rebecca Gordon[1-2], Dominic Wyse[1], Hiruni Aluthgamage[1], Samara Bonna[2-4]
1 UCL Institute of Education, London, United Kingdom
2 Centre for Educational Neuroscience, London, United Kingdom
3 Birkbeck, University of London, United Kingdom
4 The Open University , London, United Kingdom

3. Psicomates-kids 1 and 2: A comprehensive app-based program for early mathematics training in preschool education
Estibaliz Aragón[1], Santiago Reguera[1], María del Carmen Canto[1], Carlos Mera[1], Malena Manchado[1], Lydia Mateo[1], Estrella Velázquez[1], Daniel Cruz[1]
1 University of Cadiz, Spain

4. Training evidence-based precursors of early mathematics through educational apps: a pilot study
Lydia Mateo Ramos[1], Malena Manchado Porras[1], Santiago Reguera Lozano[1], Estíbaliz Aragón Mendizábal[1], María del Carmen Canto López[1], Carlos Mera Cantillo[1], Estrella Velázquez Barbosa[1], Daniel Cruz Jurado[1]
1 University of Cádiz (Universidad de Cádiz, UCA), Spain

5. Effects of multiplication interventions on multiplication learning in elementary school students: a systematic review and meta-analysis

Sonja Julkunen[1], Johan Korhonen[2], Mathilda Sandman[2], Pirjo Aunio[3]
1 University of Turku, TRILA, Finland
2 Åbo Akademi University
3 University of Helsinki

6. Spatial intervention: An enduring model to build mathematics achievement

Danielle Harris[1], Ilyse Resnick[1], Nicola Kovacs[1], Fadia Younes[1], Jonathan Adams[1], Sitti Patahuddin[1], Tom Lowrie[1]
1 University of Canberra, Australia

IT8

Wed, 24 Jun 2026, 10:45-12:15 | T2 - CLA

1. Spatial numerical associations in the perception of trend from graphs

Nick Tarantino[1], Martha Alibali[1]
1 University of Wisconsin–Madison, United States of America

2. An exploratory study of the vertical SNARC effect in Mayan numerals: Effects of language transparency and reading direction

Emmett Speed[1-2], Kerry Jordan[1]
1 Utah State University, United States of America
2 Kansas State Department of Education

3. The numerical ratio and congruency effects in numerosity and magnitude comparison depend on stimulus duration

Yulia Kuzmina[1]
1 Independent researcher, Serbia

4. The source of the SNARC effect, LTM vs WM

Yafit Oscar[1-2], Avishay Henik[1]
1 Ben Gurion University of the Negev, Israel
2 Achva academic college, Israel

5. Mental and visual representations of ordinality - a cross-linguistic study with word problems

Ann Mary John[1-2], Mônica Macedo-Rouet[1], Hippolyte Gros[2]
1 Learning Transitions Research Unit, CY Cergy Paris Université, Paris, France
2 CRPN, Aix-Marseille University, Marseille, France

6. Why is the explanation of operational momentum in non-symbolic arithmetic based on the involvement of internal spatial attention most appealing?

Maciej Haman[1], Zuzanna Kozakiewicz[1], Tymon Rochowski[1], Małgorzata Szeler[1]
1 University of Warsaw, Poland

IT9

Wed, 24 Jun 2026, 10:45-12:15 | T3 - CLA

1. Assessing percentage knowledge and curricular coverage in middle childhood

Josetxu Orrantia[1], Paula Muñoz[1], Nathalia C. Molina[1], Santiago Vicente[1], Laura Matilla[1], Rosario Sanchez[1], David Muñez[2], Jose M. Chamoso[1]
1 University of Salamanca, Spain
2 National Institute of Education, Singapore

2. From consumer to designer: Procedural bias in mathematical task adaptation among pre-service teachers

Evelyn Musilová[1-2], Miroslava Janečková[1]
1 Jan Evangelista Purkyne University in Usti nad Labem, Faculty of Education, Department of Preschool and Primary Education, Czech Republic
2 Charles University, Faculty of Physical Education and Sport, Sport Sciences–Biomedical Department, Czech Republic

3. Home Math Environment and Math Achievement: A pre-registered update meta-analysis of Daucourt et al. (2021)

Jumi Lam[1], Charles Chiu Hung Yip[2-3], Yuen Pui Tam[3], Denes Szucs[3], Terry Tin-Yau Wong[2]
1 Faculty of Education, University of Hong Kong, HKSAR
2 Department of Psychology, University of Hong Kong, HKSAR
3 Department of Psychology, University of Cambridge, UK

4. Learning opportunities for understanding the place value systems in textbooks for mathematical primary school education

Laura Ucke[1], Moritz Herzog[1]
1 Universität zu Köln, Germany

5. Exploring Canadian teachers' use of manipulatives in their daily mathematics practice

Arielle Orsini[1], Megan Foulkes[2], Helena P. Osana[1]
1 Concordia University, Canada
2 Loughborough University, United Kingdom

6. Screening early numerical development in Brazilian children: Adaptation and validation of MARKO-S

Fernanda Rocha de Freitas[1], Moritz Herzog[2], Mariuche Gomides[1], Antje Ehlert[3], Annemarie Fritz[4], Vitor Geraldi Haase[1]
1 Graduate Program in Psychology: Cognition and Behavior, Federal Univerisity of de Minas Gerais, Brazil
2 Institute for Mathematics Education, University of Cologne, Germany
3 Institute for Inclusive Education, University of Potsdam, Germany
4 Akademie Wort + Zahl, Germany

IT10

Wed, 24 Jun 2026, 10:45-12:15 | T4 - CLA

1. The early number knowledge scale (ENKS): a tool for assessing early numeracy
Francesco Sella[1], Annamaria Porru[2], Rosanna Arpino[3], Monica Besuschio[2], Eleonora Bonin[4], Andrea Carolina Carducci[4], Maria Lidia Mascia[5], Lucia Pacetta[4], Maria Petronilla Penna[6], Cristina Semeraro[7], Daniela Lucangeli[2]
1 Department of Mathematics Education, Loughborough University, United Kingdom
2 Department of Developmental Psychology and Socialization, University of Padova, Italy
3 CNIS Taranto, Italy
4 Department of Philosophy, Sociology, Pedagogy and Applied Psychology, University of Padova, Italy
5 History, Humanities and Education, University of Sassari, Italy
6 Department of Pedagogy, Psychology, Philosophy, University of Cagliari, Italy
7 Department of Education, Psychology, Communication (For.Psi.Com.), University of Bari Aldo

2. Early visual processing of alphanumeric stimuli: Shared or distinct mechanisms for letters and digits?
Ana Calviño[1], Critina Gutiérrez-Fernández[1], Ismael Gutiérrez-Cordero[1], Javier García-Orza[1]
1 Universidad de Málaga, Spain

3. From contrived trials to spontaneous speech: Measuring mathematical language in preschool children
Maithri Sivaraman[1]
1 Teachers College, Columbia University, United States of America

4. Succeeding at solving word problems at age 5: what matters?
Uliana Timina[1], Marie-Caroline Croset[2], Fanny Gimbert[3], Karine Mazens[1]
1 Univ. Grenoble Alpes, CNRS, LPNC, France
2 Univ. Grenoble Alpes, CNRS, LIG, France
3 Univ. Grenoble Alpes, LaRAC, France

5. Interference in children's learning of multiplication facts
Lucy Cragg[1], Natasha Guy[2], Charlotte E. H. Wilks[1,3], Joanne Eaves[1-2], Camilla Gilmore[2]
1 University of Nottingham, United Kingdom
2 Loughborough University, United Kingdom
3 Durham University, United Kingdom

6. Early third-grade students' understanding of the place-value position principle for two-digit and three-digit numbers
Anna Kaiser[1], Stefan Ufer[1]
1 LMU Munich, Germany

IT11

Thu, 25 Jun 2026, 10:45-12:15 | A+B Psico 3

1. Visual number symbols and linguistic transparency: Abacus–word transcoding in Italian
Kazuma Kinoshita[1]
1 Kyoto university, Japan

2. From perceptual cues to symbolic codes: How spatial frequency and linguistic markedness shape numerosity judgments
Jochen Laubrock[1]
1 University of Potsdam, Germany

3. Language-Switching Costs in numerical processing: Examining Arabic digit representations as a mediating code
Moritz Wussing[1], Kevin Baumschlager[2], Henrik Saalbach[1], Roland Grabner[2]
1 Universität Leipzig, Germany
2 Universität Graz, Austria

4. Concept-motivated signs as an embodied approach to STEM learning
Rachel Sortino[1], Christina Kim[1], Meghan McGarry[1], Alicia Wooten[1], Lorna Quandt[1], Rachel Pizzie[1]
1 Gallaudet University, United States of America

5. Building early math skills in preschoolers: the role of working memory and gesture use
Sofia Uribe[1], Maylee Ascanio[1], Meredith Rowe[2], Geetha Ramani[1]
1 University of Maryland, College Park
2 Harvard University

6. When Numbers are not enough: The Impact of Language Skills on Preschoolers' Response to Math Interventions
Luisa Wagner[1], Nadine Poltz[1]
1 Universität Potsdam, Germany

IT12

Thu, 25 Jun 2026, 10:45-12:15 | T1 - CLA

1. Differing gender stereotypes in adults' perceptions of toys supporting numeracy, spatial reasoning, and patterning skills
Megan Merrick[1], Andrew White[2], Amanda Diekman[1], Emily Fyfe[1]
1 Indiana University, Bloomington, United States of America
2 Ball State University, United States of America

2. Mathematics as a gateway: the role of school gender in girls' STEM trajectories
Tanya Evans[1], Huayu Gao[1]
1 University of Auckland, New Zealand

3. Sex or gender?: examining sex differences at preschool age in mathematical cognition
Daniel Cruz Jurado[1], María del Carmen Canto López[1], Estíbaliz Aragón[1], Estrella Velázquez[1], Santiago José Reguera Lozano[1], Carlos Mera Castillo[1], Lydia Mateo Ramos[1], Malena Manchado Porras[1]
1 Universidad de Cádiz, Spain

4. Understanding the multifaceted nature of math gender stereotype among Chinese parents of preschoolers
Linxi Lu[1], Saya Ito[1]
[1] University of Chicago, United States of America

5. Self-efficacy in mathematics and reading in early primary school: links to skill development, gender and parents' difficulties
Tonje Amland[1-2], Anita Lopez-Pedersen[1], Vibeke Rønneberg[3]
1 Department of Special Needs Education, University of Oslo, Norway;
2 CREATE - Centre for Research on Equality in Education, University of Oslo, Norway
3 Department of Special Needs Education, University of Oslo, Norway

6. Cognitive predictors and gender differences in early mathematical performance: evidence from TEMA-3
Malena Manchado Porras[1], María del Carmen Canto López[1], Estíbaliz Aragón Mendizábal[1], Santiago Reguera Lozano[1], Lydia Mateo Ramos[1], Carlos Mera Cantillo[1], Estrella Velázquez Barbosa[1], Daniel Cruz Jurado[1]
1 University of Cadiz, Spain

IT13

Thu, 25 Jun 2026, 10:45-12:15 | T2 - CLA

1. Dynamic Assessment of preschoolers' numeracy
Nathalie Parry[1-2], Kelly Trezise[1], Robert Reeve[1], Sean Kang[1], Lorraine Graham[1], Bert De Smedt[2]
1 University of Melbourne, Australia
2 KU Leuven, Belgium

2. Do children attend to mathematical content in early mathematics storybooks? An exploratory eye-tracking study
Yushu Wang[1], Korbinian Moeller[1-2], Julia Bahnmueller[1-2]
1 Loughborough University
2 University of Tübingen

3. Rethinking mathematics curricula in light of innate numerical capabilities
Said Boutiche[1]
1 University Mhamed Bougara of Boumerdes, Algeria

4. Fostering second graders' understanding of base-ten structure through analogy-based instruction
Mélanie Barilaro[1], Helena P. Osana[1], Anne Lafay[1-2]
1 Concordia University, Canada
2 Université Savoie Mont-Blanc

5. Validating a video-vignette test for primary teachers' mathematics diagnostic competence
Thea Radke[1], Antje Ehlert[1]
1 Universität Potsdam, Germany

6. An investigation into early educational practice as a moderator of socio-economic gradients in mathematics
Rosemary O'Connor[1], Emma Blakey[2], Gaia Scerif[1]
1 University of Oxford, United Kingdom
2 University of Sheffield, United Kingdom

IT14

Thu, 25 Jun 2026, 10:45-12:15 | T3 - CLA

1. Task-specific neural effects of numerical training related to mathematics anxiety
Simge Altınok[1-2], Sertaç Üstün[1-3], Kevser Aktaş[4], Nihal Apaydın[1,2,5], Metehan Çiçek[2,6]
1 Department of Interdisciplinary Neuroscience, Institute of Health Sciences, Ankara University, Turkey
2 Neuroscience and Neurotechnology Center of Excellence, Ankara, Turkey
3 Department of Physiology, School of Medicine, Ankara University, Turkey
4 Division of Mathematics Education, Department of Mathematics and Science Education, Faculty of Education, Gazi University, Ankara, Turkey
5 Department of Anatomy, School of Medicine, Ankara University, Turkey
6 Department of Physiology, School of Medicine, Ankara Medipol University, Turkey

2. When overcoming a fraction misconception leads to more anxiety: Replication of a phenomenon
Hilma Halme[1], Wim Van Dooren[2], Jo Van Hoof[2-3]
1 University of Oulu, Finland
2 KU Leuven, Belgium
3 Univeristy of Turku, Finland

3. Five Things About Maths (5TAM): A rapid, language-based method for estimating students' affective response to mathematics
JohnPaul Kennedy[1], Rebecca Marrone[1], Simon Baird[2], Florence Gabriel[1]
1 Adelaide University, Adelaide, South Australia, Australia
2 Illawarra Sports High School, Berkeley, New South Wales, Australia

4. Insights from evaluating adolescents' metacognitive accuracy during a mathematics standardized test
Madeleine Kingan[1], Jon Star[1]
1 Harvard Graduate School of Education, United States of America

5. Fractions or decimals? How visual displays affect preference for rational number notation
Fiona Briese[1], Annette Kinder[1]
1 Freie Universität Berlin, Germany

IT15

Thu, 25 Jun 2026, 10:45-12:15 | T4 - CLA

1. Instructional trial in arithmetic fact retrieval
Bettina Pedemonte[1]
1 University of San Francisco, California, United States of America

2. Exploring the role of growing pattern skills in conceptually-derived arithmetic strategies by 6– to 10-year-olds
Joanne Eaves[1], Giulia Borriello[2]
1 Loughborough University, United Kingdom
2 Kent State University, United States of America

3. Students' profiles of place value understanding
Moritz Herzog[1]
1 University of Cologne, Germany

4. The effects of process-oriented feedback and revisions on middle schools' fraction arithmetic performance
Sarah Clerjuste[1], Christina Barbieri[2]
1 University of Wisconsin- Madison
2 University of Delaware

5. How is number length processed in multi-digit numbers? Evidence from a leftmost-digit comparison task
Ismael Gutiérrez-Cordero[1], Cristina Gutiérrez-Fernández[1], Ana Calviño[1], Javier García-Orza[1]
1 University of Málaga, Spain

6. Relations between visual distraction, inhibitory control, and children's math estimation performance
Kerry Lee[1], Patrick Lemaire[1], Alfredo Bautista[1], Tak Yue Dickson Chan[1]
1 Yew Chung College of Early Childhood Education, Hong Kong S.A.R., China

POSTERS

Poster Session 1

Tue, 23 Jun 2026, 13:15-14:00 | CLA first floor

1. SNARC-like effects for human body weight

Michele Vicovaro[1], Anna Lorenzoni[2], Loris Brunello[2], Mario Dalmaso[1]
1 Department of General Psychology, University of Padova, Italy
2 Department of Social and Developmental Psychology, University of Padova, Italy

2. The relation between number line ability and mathematics for aphantastics

Laura Melvin[1], Mandy George[1], Darcy Hallett[1], Moriah Sokolowski[1], Brianna O'Brien[1]
1 Memorial University of Newfoundland, Canada

3. A hierarchical model of graphicacy skills: evidence for perceptual foundations and conceptual development in children and adults

Melina Vladisauskas[1-2], Lorenzo Ciccione[1,3], Marie Lubineau[2], Syalie Liu[2], Cassandra Potier Watkins[2], Stanislas Dehaene[1-2]
1 Cognitive Neuroimaging Unit, CEA, INSERM, Université Paris-Saclay, NeuroSpin Center, France
2 Collège de France, Université Paris Sciences Lettres (PSL), France
3 Department of Psychology, DysCo Lab, Université Paris 8, France

4. Auditory magnitude processing and its development from birth to six-months-old

Kaisa Lohvansuu[1], Jarmo Hämäläinen[1], Minna Torppa[1], Tuire Koponen[1]
1 University of Jyväskylä, Finland

5. Children's development of mathematical equivalence and arithmetic fluency.

Ayushi Chitranshi[1], Michael Slipenkyj[1], Taeko Bourque[1], Heather Douglas[1], Jo-Anne LeFevre[1]
1 Carleton University, Canada

6. Number line estimation training in preschoolers enhances the impact of approximate numerical skills on symbolic magnitude processing

Maybí Morell-Ruiz[1], Eva-Maria Ternblad[1], Betty Tärning[1], Sonja Holmer[1], Magnus Haake[1], Agneta Gulz[1]
1 Lund University, Sweden

7. Spontaneous grip force fluctuations: A lens into cognitive processing of numbers

Oliver Lindemann[1]
1 Erasmus University Rotterdam, The Netherland

8. Effect of serial order working memory on the relation between visuospatial reasoning and calculation abilities in typical children.

Solène Koller[1], Lucie Attout[1]
1 University of Geneva, Switzerland

9. Living on a thin line. Cross-age comparison of theoretical models of numerical mapping.

Wiktor Zielinski[1-2], Dominika Lipińska[1], Natalia Hetman[1], Tomasz Smoleń[3], Elżbieta Szpakiewicz[4], Szymon Wichary[1], Monika Szczygieł[1]
1 Institute of Psychology, Jagiellonian University in Kraków, Poland
2 Doctoral School of Social Sciences, Jagiellonian University in Kraków, Poland
3 Centre for Cognitive Science, Jagiellonian University in Krakow, Poland
4 Institute of Psychology, University of the National Education Commission, Poland

10. Neural Integration of multiplication across symbolic and non-symbolic format in the math-responsive network

Elise Roth[1], Marie Amalric[1]
1 Cognitive Neuroimaging Unit, INSERM, CEA, CNRS, Université Paris Saclay, NeuroSpin center, France

11. Neural mechanisms of number word learning in preschoolers

Nina Jost[1], Stephanie Bugden[2], Samuel Forbes[1], Anna Matejko[1]
1 Durham University, United Kingdom
2 University of Winnipeg, Canada

12. Assessing numerical spatial associations through intuitive preferences

Magali Dumureau[1-2], Catherine Thevenot[1], Matthias Hartmann[2]
1 University of Lausanne, Switzerland
2 UniDistance Suisse, Switzerland

13. Reliability and feasibility of measuring the Approximate Number System in early childhood across samples and settings

Alex Silver[1], Shirley Duong[1], Andrew Ribner[1-2], Danielle Fox[1], Heather Bachman[1], Elizabeth Votruba-Drzal[1], Melissa Libertus[1]
1 University of Pittsburgh, United States of America
2 Chatham University, United States of America

14. Review of previous reports of the approximate number system acuity reliability.

Tia Križan[1], Attila Krajcsi[2], Monika Szczygieł[3], Bert Reynvoet[4]
1 University of Ljubljana, Faculty of Education, Cognitive Science, Slovenia
2 Department of Cognitive Psychology, Institute of Psychology, ELTE Eötvös Loránd University, Hungary
3 Jagiellonian University in Kraków, Institute of Psychology, Poland
4 KU Leuven, Leuven, Belgium

15. Arithmetic fluency is more important than intelligence in predicting expertise in chess

Roland H. Grabner[1], Alexander Lorenz[1], Hannah Sommer[1], Merim Bilalic[2]
1 University of Graz, Austria

2 Northumbria University Newcastle, UK

16. Integration of Non-symbolic and Symbolic Numbers in Preschoolers

Yesenia Arévalo-Jaimes[1]
1 University of Pittsburgh, United States of America

17. Does A-B-C = 1-2-3? Investigating the cognitive processes underlying the ordinal processing of letters and numbers

Lucas Miller[1], Michael Slipenkyj[2], Ian Lyons[1]
1 Georgetown University, United States of America
2 Carleton University, Canada

18. Effect of an intervention on working memory order versus numerical cognition in children with learning difficulties in mathematics: a multiple case study.

Lucie Attout[1]
1 University of Geneva, Switzerland

19. Neural Highways of Learning: A DTI Study on Arithmetic & Metacognition in primary school

Elien Bellon[1-2], Floor Vandecruys[1-2], Maaike Vandermosten[2-3], Bert De Smedt[1-2]
1 Psychology and Educational Sciences, Parenting and Special Education Research Group, KU Leuven, Belgium
2 Leuven Brain Institute, KU Leuven, Belgium
3 Experimental ORL, Department of Neurosciences, KU Leuven, Belgium

20. Serial order working memory as a potential origin of visuospatial working memory impairment in developmental dyscalculia

Laura Ordonez Magro[1], Lucie Attout[1]
1 University of Geneva, Switzerland

21. SNAs in ocular drift: does number magnitude influence involuntary oculomotor behavior?

Stefano Pileggi[1], Federico D'Atri[1], Alberto Mariconda[1], Valter Prpic[2], Carlo Fantoni[1], Mauro Murgia[1]
1 Department of Life Sciences, University of Trieste, Italy
2 Department of Theoretical and Applied Sciences, eCampus University

22. Switch Costs in Symbolic and Non-Symbolic Ordinality

Elad Avraham[1], Hanit Galili[2], Avishai Henik[1], Yarden Gliksman[3]
1 Ben-Gurion University of the Negev, Israel
2 University of Haifa, Israel
3 Ruppin Academic Center, Israel

23. The effects of task demand manipulations in symbolic number comparison

Sohnia Ghattaura[1], Gaia Scerif[2], Krzysztof Cipora[3], Ann Dowker[2], Joanne Eaves[1], Camilla Gilmore[1], Silke M. Göbel[4-5], Francesco Sella[1], Victoria Simms[1], Hanna Weiers[1], Franz Wortha[1], Iro Xenidou-Dervou[1]
1 Loughborough University, United Kingdom
2 University of Oxford, United Kingdom
3 Jagiellonian University in Krakow, Poland
4 University of York, United Kingdom
5 University of Oslo, Norway

24. The role of spatial reasoning in mathematics learning difficulties: A meta-analysis

Jessica Shapiro[1], Zeyana Musthafa[1], Zachary Hawes[1]
[1] University of Toronto, Canada

25. Exploring the nature of proactive interference in an auditory multiplication task

Marguerite Huens[1], Cloé Geuquet[1], Sylvain Gerin[1], Benjamin Brise[1], Mauro Pesenti[1], Marie-Pascale Noël[1], Michael Andres[1], Nicolas Masson[1]
1 UCLouvain, Belgium

26. Evidence of proto-arithmetic in zebrafish (Danio rerio)

Valeria Anna Sovrano[1-2], Lorenza Montel[1-2], Gionata Stancher[3], Giorgio Vallortigara[1-2], Davide Potrich[1]
1 Center for Mind/Brain Sciences - CIMeC, University of Trento, Italy
2 Department of Psychology and Cognitive Science, University of Trento, Italy
3 Civic Museum Foundation of Rovereto, Italy

27. No distance effect in visual or decision-level processing for symbolic numbers in a number comparison task: An event-related potential study

Petia Kojouharova[1], Tia Križan[2], Attila Krajcsi[3]
1 Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences, Hungary
2 University of Ljubljana, Faculty of Education, Cognitive Science, Slovenia
3 Cognitive Psychology Department, Institute of Psychology, ELTE Eötvös Loránd University, Hungary

28. Prime magnitude shapes numerical distance perception at the single-trial level: Evidence for a "Prime Anchoring Effect"

Serena Mingolo[1], Rut Zaks-Ohayon[2-3], Ravid Ania[1], Nadav Neumann[1], Joseph Tzelgov[4-5], Samuel Shaki[1], Michal Pinhas[1]
1 Department of Psychology, Ariel University, Israel
2 Brain-IL the national brain stimulation institute, The Mental Health Medical Center, Beer Sheva, Israel
3 Joyce & Irving Goldman Medical School, Ben-Gurion University of the Negev, Beer Sheva, Israel
4 Department of Psychology, and Zlotowski Center for Neuroscience, Ben-Gurion University of the Negev, Beer Sheva, Israel
5 Department of Cognitive and Brain Sciences, Ben-Gurion University of the Negev, Beer Sheva, Israel

29. The compositional structure of natural number concepts: insights from representational similarity among small numbers

Maelle Dagnogo[1-2], Lorenzo Ciccione[3], Stanislas Dehaene[2,4]
1 Université Paris Cité, Paris, France
2 Unité de Neuroimagerie Cognitive (Unicog), Neurospin, CEA, Saclay, France
3 Université Paris 8 Vincennes - Saint-Denis, Saint-Denis, France
4 Collège de France, Paris, France

30. What's odd with number 7?

Samuel Lepoittevin[1], Mariagrazia Ranzini[2], Michael Andres[1]
1 Université catholique de Louvain, Belgium
2 University of Padua, Italy

31. A comparison of monetary and numerical quantities with the number-to-position task

Ngoc Linh Trang Dang[1], Zofia Maria Jaworska[1], Elisa Gambaretto[1], Mario Bonato[1], Mariagrazia Ranzini[1]
1 University of Padova, Italy

32. Application of Drift Diffusion Model on transitive inference under immediate and delayed response conditions in rhesus monkeys

Sara Dal Sasso[1], Mariella Segreti[1-2], Fabio Di Bello[1], Surabhi Ramawat[1], Stefano Ferraina[1], Pierpaolo Pani[1], Emiliano Brunamonti[1]
1 Department of Physiology and Pharmacology, Sapienza University, Rome, Italy
2 Behavioural Neuroscience PhD Program, Sapienza University, Rome, Italy

33. How do numerical magnitude and ordinal information contribute to spatial-numerical associations? An investigation using the Implicit Association Task

Matthias Hartmann[1], Magali Dumureau[1-2], Catherine Thevenot[2], Valter Prpic[3]
1 UniDistance Suisse, Switzerland
2 University of Lausanne, Switzerland
3 eCampus University, Novedrate, Italy

34. Shared distance effects in line ratio processing: Effects of task design and response method

Yiwen Luo[1], Edward Hubbard[1]
[1] University of Wisconsin-Madison, United States of America

35. Numerosity perception of real-world objects: a new open image dataset

Elisabeth Verschure[1], Ida Bosio[2], Giulio Contemori[2], Kuinan Hou[2], Alberto Testolin[2], Marco Zorzi[3]
1 KU Leuven, Leuven, Belgium
2 Department of General Psychology, University of Padua, Padua, Italy
3 IRCCS Ospedale San Camillo, Venice-Lido, Italy

36. How are non-symbolic representations formed from dot arrays? Testing four accounts using an artificial symbol learning paradigm.

Khudaija Ahmad[1], Mathew Inglis[1], Camilla Gilmore[1]
1 Loughborough University, United Kingdom

37. Metacognitive confidence judgments predict performance in novel arithmetic learning in adults

Annika Lemanski[1], Shiva Taghizadeh[1], Eveline Jacobs[2], Bert De Smedt[2], Stephan Vogel[1]
1 University of Graz, Austria
2 KU Leuven, Belgium

38. How do learners collaborate when reasoning with visual representations of math concepts in applied contexts? Insights from two studies.

Marta Mielicki[1], Hui Yang[1], Jessica Mislevy[1], Nonye Alozie[1]
1 SRI International, United States of America

Poster Session 2

Tue, 23 Jun 2026, 17:00-17:45 | CLA first floor

1. Defining the contribution of the sensorimotor system to numerical cognition in adulthood and in the elderly: a functional Near-Infrared Spectroscopy (fNIRS) study

Sara Noacco[1], Maria Silvia Saccani[1], Elena Nava[2], Michelle Giraud[2], Simone Cutini[3], Giovanna Mioni[1], Michael Andres[4], Swathi Prabhu[2], Sara Errigo[1], Sabrina Brigadoi[3], Mariagrazia Ranzini[1]
1 Department of General Psychology - University of Padua, Italy
2 University of Milano - Bicocca, Italy
3 Department of Developmental Psychology and Socialisation - University of Padua, Italy
4 Université catholique de Louvain, Belgium

2. Grounded-cognition learning with a VR Lorenz model and eye-tracking

MINZHI LIU[1]
1 University of Iowa, United States of America

3. Evaluations of abstract and imagistic models for discrimination and estimation

Eivind Kaspersen[1], Trygve Solstad[1]
1 Norwegian University of Science and Technology, Norway

4. Mathematical expertise modulates the electrophysiological processing of mathematical word meanings in a context-dependent manner

Glenn De Muynck[1], Marta Ghio[2], Christian Bellebaum[2], Laura Bechtold[2]
1 University of Bologna, Italy
2 Heinrich Heine University Düsseldorf, Germany

5. A diffusion model-based investigation of the SNARC effect

Dávid Csúri[1], Attila Krajcsi[1]
[1] Department of Cognitive Psychology, Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary

6. Arithmetic in Parkinson's disease: A systematic review and meta-analysis

Karina Foster[1], Hannah D. Loenneker[2], Netta Rumack[1], Michael Ullman[3], William Saban[1]
1 Center for Accessible Neuropsychology, Tel Aviv University, Israel
2 Tübingen University, Tübingen, Germany
3 Department of Neuroscience, Georgetown University, Washington D.C., United States

7. Boosting number sense and reading skills through visuo-spatial attention: Action video game training in children with developmental dyscalculia

Sara Bertoni[1], Sandro Franceschini[2], Monja Tait[3], Claudio De'Sperati[4], Andrea Facoetti[2], Simone Gori[1]
1 University of Bergamo, Italy
2 University of Padua, Italy

3 Studio di Neuropsicologia ScuoL@b, Trento, Italy
4 Vita Salute San Raffaele University, Milan, Italy

8. Cognitive predictors of financial and numerical abilities in mild cognitive impairment

Angela Boschetti[1], Laura Danesin[1], Elena Piazzalunga[1-2], Francesca Burgio[1]
1 IRCCS San Camillo Hospital, Italy
2 University School of Advanced Studies IUSS Pavia, Italy

9. Beyond averages: SES, sex, and skill-specific Matthew effects in reading and arithmetic for children with and without SLD

Cristina Rodríguez[1]
1 Universidad Católica de la Santísima Concepción, Chile

10. Reliability of the approximate number system acuity

Daria Kuznetsova[1], Attila Krajcsi[1], Monika Szczygieł[2], Tia Križan[3], Bert Reynvoet[4]
1 Eötvös Loránd University, Hungary
2 Jagiellonian University in Kraków, Institute of Psychology, Poland
3 University of Ljubljana, Faculty of Education, Cognitive Science, Slovenia
4 KU Leuven, Leuven, Belgium

11. Working memory and beyond: Cognitive predictors of mathematics performance in typically developing children

Katie Allen[1], Rebekah Lowes[1], Milly Preston[1]
1 Newcastle University, United Kingdom

12. Give me 5: The development of quantity recognition

Leah Marshall[1], Jo-Anne LeFevre[1], Shuyuan Yu[2], Rebecca Merkley[1]
1 Carleton University, Canada
2 University of California, Irvine, USA

13. Neural fidelity of number representations in preschoolers relates to conceptual understanding of arithmetic

Nydia Vurdah[1], Tanmay Shikhare[1], Daniel C. Hyde[1]
1 University of Illinois Urbana-Champaign, United States of America

14. RobotiMath project: an educational robotics program to enhance early ,mathematical cognition in early childhood education

Estrella Velázquez[1], María del Carmen Canto[1], Estíbaliz Aragón[1], Malena Manchado[1], Lydia Mateo[1], Santiago Reguera[1], Carlos Mera[1], Daniel Cruz[1]
1 Universidad de Cádiz, Spain

15. Neural adaptation to repeated visual input under sustained perceptual load

Zeynep Ceren Onlat[1-2], Sertaç Üstün[1-2], Hilal Kolenoğlu[2], Merve Ceren Akgör[2], Doğa Vurallı[2-3], Metehan Çiçek[2-4], Sarper Alkan[2,5], Hayrunnisa Bolay[2-3]
1 Ankara University, Faculty of Medicine, Department of Physiology, Turkey
2 Neuroscience and Neurotechnology Center of Excellence (NÖROM), Ankara, Turkey
3 Gazi University, Faculty of Medicine, Department of Neurology, Ankara, Turkey
4 Ankara Medipol University, Faculty of Medicine, Department of Physiology, Turkey
5 Ankara Science University, Faculty of Engineering, Department of Software Engineering, Turkey

16. Imagine this! Undergraduate students use mental imagery functions to complete a geometry task.

Veronic Delage[1], V. Burak Sanel[1], Fraulein Retanal[1], Erin A. Maloney[1]
1 University of Ottawa, Canada

17. The role of visual–spatial perception and short-term memory in early mathematical development

Antje Ehlert[1], Nadine Poltz[1]
1 University of Potsdam, Germany

18. The effect of language interventions on students' mathematics achievement: A systematic review and meta-analysis

Elin Nordbø[1], Vibeke Rønneberg[1], Monica Melby-Lervåg[2], Tonje Amland[2], Oddny Solheim[1], Anita Lopez-Pedersen[2]
1 University of Stavanger, Norway
2 University of Oslo, Norway

19. An investigation of word-problem reading comprehension and oral reading fluency in students with and without mathematics difficulty

Audrey Merat[1], Kayla Garvais[1]
1 The University of Texas at Austin, United States of America

20. A Possible Advantage of Recruiting Non-Academic Student Samples:Testing the Effect of Sample Heterogeneity on the Reliability of Executive Function Measurements

Hanna Ágota Asbóth[1], Attila Krajcsi[1]
1 Department of Cognitive Psychology, Institute of Psychology, ELTE Eötvös Loránd University

21. Logical reasoning and mathematics achievement: A meta-analysis

Charles Chiu Hung Yip[1], Terry Tin-Yau Wong[1], Kinga Morsanyi[2-3], Matthew Inglis[2-3], Xiangzi Ouyang[4]
1 Department of Psychology, The University of Hong Kong
2 Department of Mathematics Education, Loughborough University
3 Centre for Mathematical Cognition, Loughborough University
4 Department of Psychology, Lingnan University, Hong Kong

22. Linking narrative Competence to Adult Word-Problem Performance

Gabriella Daroczy[1], Hans-Christoph Nuerk[2]
1 Department of Psychology, University of Tuebingen, LEAD Graduate School & Research Network, University of Tuebingen
2 Department of Psychology, University of Tuebingen, LEAD Graduate School & Research Network, University of Tuebingen, German Center for Mental Health (DZPG), partner site Tuebingen

23. Visual mathematics writing: examining students' performance in visual and text integration

Haorui Cui[1], Xin Lin[1]
1 Faculty of Education, University of Macau

24. Examining associations between geometry knowledge and broader math and executive function skills in preschoolers

Jisun Kim[1], David Purpura[1]
1 Purdue University

25. Impact of Cabri-Express, a dynamic geometry software, on geometry skills in children with probable DCD

Victoria Chazal-Piquand[1], Alice Gomez[1], Joris Mithalal[2]
1 Centre de Recherche en Neurosciences de Lyon (CRNL), France
2 Sciences, Société, Historicité, Education, Pratiques (S2HEP), France

26. Mnemonic profiles associated with advanced mathematical training

Grace Yee[1-2], Ryan Yeung[2], Amina Shmanova[4], Brian Levine[2-3], Moriah Sokolowski[1-2]
1 Toronto Metropolitan University
2 Rotman Research Institute at Baycrest
3 University of Toronto
4 University of Texas at Austin

27. Neural correlates and overlap of orthographic and arithmetic learning

Chiara Banfi[1], Karl Koschutnig[1], Andreas Fink[1], Karin Landerl[1-2]
1 University of Graz, Austria
2 BioTechMed, Austria

28. Effects of visual representations on addition fact accuracy and strategy use

Emma Page[1], Riley Bock[1], Kelly-Ann Gesuelli[2], Patrick Kirkland[1], Nicole McNeil[1]
1 University of Notre Dame, United States of America
2 University of Florida, United States of America

29. Evaluating fNIRS for studying mathematical cognition: A systematic review

Tanya Kaur Talwar[1], Grace Yee[2-3], Hannah Whitehead[1], Hillary Mastarciyan[2], Dahlia Langburt[1], Zachary Hawes[1], Moriah Sokolowski[2-3]
1 University of Toronto, Canada
2 Toronto Metropolitan University, Canada
3 Rotman Research Institute at Baycrest, Canada

30. ERP responses to auditory and visual presentation of magnitudes and quantities in adults

Sadiq Mobeen[1], Kaisa Lohvansuu[1], Tuire Koponen[1], Minna Torppa[1], Jarmo Hämäläinen[1]
1 University of Jyväskylä, Finland

31. Where number meets space and time: behavioral and neural perspectives on magnitude processing

Burcu Sirmatel Bakriyanik[1-3], Fuat Balci[4-5], Sertaç Üstün[2,3,6], Metehan Çiçek[3,7]
1 Department of Biophysics, Faculty of Medicine, Lokman Hekim University, Turkey
2 Department of Interdisciplinary Neuroscience, Institute of Health Sciences, Ankara University, Turkey
3 Neuroscience and Neurotechnology Center of Excellence (NÖROM), Turkey
4 Department of Biological Sciences, University of Manitoba, Winnipeg, MB, Canada
5 Department of Psychology, Koç University, Istanbul, Turkey
6 Department of Physiology, School of Medicine, Ankara University, Turkey
7 Department of Physiology, School of Medicine, Ankara Medipol University, Ankara, Turkey

32. Neurocognitive Mechanisms of Mathematical Cognition in Individuals with Williams Syndrome and Down Syndrome: a pre-registration

Jiajie Li[1], Jo Van Herwegen[1], Mojtaba Soltanlou[1]
1 UCL, United Kingdom

33. Narrative, multiplicative structure, and subitizing range as supports for children's unitizing: A pilot study

Monyka L. Rodrigues[1], Helena P. Osana[1], H. Moriah Sokolowski[2], Martha W. Alibali[3]
1 Concordia University, Canada
2 Toronto Metropolitan University, Canada
3 University of Wisconsin - Madison, USA

34. Working memory modulation of math anxiety–performance relations in children with and without mathematical learning difficulties: an fNIRS investigation

Masoud Mehdizadeh[1], Leyla Rastgar-Farajzadeh[2]
1 Department of Cognitive Neuroscience, Faculty of Educational Sciences and Psychology, Tabriz University, Iran
2 Department of Neurosciences and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Iran

35. Is there an "arithmetic ior" (inhibition of return) in internal attention "recycled" for the purposes of non-symbolic mental arithmetic?

Tymon Rochowski[1], Maciej Haman[1], Zuzanna Kozakiewicz[1], Małgorzata Szeler[1]
1 University of Warsaw, Poland

36. Functional networks of the prefrontal cortex supporting arithmetic, verbal short-term memory and literacy development in primary school brazilian children

Katarina Duarte Fernandes[1], João Ricardo Sato[1], Katerina Lukasova[1]
1 Federal University of ABC, Brazil

37. Why should we need three notations of rational numbers? The benefits of decimals, fractions, and percentages for measurement

Siyi Liu[1], Wenqing Zhang[2], Yunqi Wang[2], Jing Tian[1]
1 Department of Psychology, Fordham University, Bronx, NY, USA
2 School of International Studies, Zhejiang University, China

Poster Session 3

Wed, 24 Jun 2026, 13:15-14:00 | CLA first floor

1. Do first impressions matter? How initial perceptions shape performance in complex math problem solving

Haya Halabieh[1], Gaeun Lee[1], Alexander Avdellas[1], Katherine Bohigian[1], Yixuan Zhao[1], Ian Lyons[1]
1 Georgetown University, United States of America

2. Mapping losses and gains in space: do numerical magnitude and emotional valence interact?

Alberto Mariconda[1], Marta Maisto[1], Valter Prpic[2], Rossana Actis-Grosso[3], Mauro Murgia[1]
1 University of Trieste, Italy
2 eCampus University, Italy
3 University of Milano-Bicocca

3. Pattern similarity affects numerosity comparison

Trygve Solstad[1], Eivind Kaspersen[1]
1 Norwegian University of Science and Technology, Norway

4. Development and evaluation of an intervention for adolescents and adults with dyscalculia

Caroline Biegel[1-2,4-6], Martina Bühler[3], Manuela Foster[3], Olivia Schmid[1-2,4,7], Noreen Battanta[1,4-5], Valerina Hajdaraj[1,4-5], Maike Renkert[1-2,4,7], Gilles de Hollander[2,7], Franziska Felder[3], Sascha Schneider[3], Christian Ruff[2,6-7], Silvia Brem[2,6,8], Nora M. Raschle[2,5,6,9], Ruth O'Gorman Tuura[1,4,6], Elisabeth Moser Opitz[3], Karin Kucian[1-2,4,6]
1 Center for MR-Research, University Children's Hospital Zurich, Switzerland
2 URPP Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
3 Institute of Education, University of Zurich, Switzerland
4 Children's Research Center, University Children's Hospital Zurich, Switzerland
5 Department of Psychology, University of Zurich, Switzerland
6 Neuroscience Center Zurich, University of Zurich and ETH Zurich, Switzerland
7 Zurich Center for Neuroeconomics, Department of Economics, University of Zurich, Switzerland
8 Department of Child and Adolescent Psychiatry and Psychotherapy, University Hospital of Psychiatry Zurich, University of Zurich, Switzerland
9 Jacobs Center for Productive Youth Development, University of Zurich, Switzerland

5. Early algebra knowledge predicts later fraction understanding and improves with fraction instruction

Michael D'Erchie[1], Claire Forsmann[2], Michael Schneider[2], Andreas Obersteiner[1]
1 Technical University of Munich, Germany
2 Trier University, Germany

6. Fine motor skills, visuospatial abilities and visuospatial working memory: how can they influence early numeracy in preschoolers?

Lorena Perrotti[1], Alessandro Cuder[1], Maria Chiara Passolunghi[1], Mauro Murgia[1], Sandra Pellizzoni[1]
1 University of Trieste, Italy

7. From the approximate number system to symbolic mathematics: evidence from a teacher-led early childhood intervention

Marcela Mena[1], Pablo Araújo[1], Jezebel Mercadal[1], Alejandro Maiche[1]
1 Universidad de la República, Uruguay

8. Growing together or growing apart? Math and reading growth trajectories among students with early co-occurring learning difficulties

Kelly-Ann Gesuelli[1], Ye Shen[2]
1 University of Florida, College of Education
2 Johns Hopkins University, School of Education

9. Learning how to use one's fingers to calculate can improve arithmetic word problem-solving at age 4

Fanny Gimbert[1], Marie-Caroline Croset[2], Natacha Boissicat[1]
1 Univ. Grenoble Alpes, LaRAC, France
2 Univ. Grenoble Alpes, LIG, France

10. The dynamic interplay and cognitive predictors of arithmetic and reading across Grades 1, 2, and 3

Karin Landerl[1-4], Silke M. Göbel[2-3], Chiara Banfi[1]
1 University of Graz, Austria
2 University of York, UK
3 University of Oslo, Norway
4 Biotechmed Graz, Austria

11. They know the facts: Older adults use fact retrieval to solve single-digit arithmetic

Katharina Sophia Sautter[1], Elise Klein[2], Christina Artemenko[1]
1 Department of Psychology, University of Tuebingen, Germany
2 LaPsyDÉ - UMR CNRS 8240, Université Paris Cité, Paris, France

12. Time-pressure practice leads to reduced arithmetic fluency acquisition in elementary school students

Erika Ikeda[1], Raeanne Martell[1], Ian Lyons[1]
1 Georgetown University, United States of America

13. Understanding where errors come from: A novel approach to measure conceptual knowledge of decimal arithmetic

Siyi Liu[1], Elizabeth Gunderson[2], Jing Tian[1]
1 Department of Psychology, Fordham University, Bronx, NY 10458, USA
2 Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN, USA

14. Automatizing arithmetic: using intensive training to examine how first graders learn single-digit addition

Morgane Papillon[1], Jérôme Prado[1]
1 Centre de Recherche en Neurosciences de Lyon (CRNL), INSERM U1028 - CNRS UMR5292, Université de Lyon, Bron, France

15. Nonsymbolic ratio processing predicts fraction knowledge in early grades

Isabella Starling Alves[1], Percival Matthews[2], Edward Hubbard[2]
1 University of Nebraska Lincoln, United States of America
2 University of Wisconsin Madison

16. Number line estimation with negative integers and its relation to mathematics competence in early middle school

Wei Jia[1], Ling-ling Wang[1], Yu-ting Liu[1], Dan Cai[1]
1 School of Psychology, Shanghai Normal University, Shanghai, China

17. Promoting arithmetic strategy diversity and mathematical fluency through Number Talks: evidence from a classroom-based intervention in Uruguay

Pablo Araújo[1], Nadir Díaz[2], Alejandro Maiche[1], Daniel Ansari[2]
1 Universidad de la República, Uruguay
2 Western University, Canada

18. The development of preservice primary school teachers' rational number knowledge during a mathematics didactics course

Pauliina Salonen[1], Jake McMullen[1], Juulia Lahdenperä[1]
1 University of Turku, Finland

19. Longer decimals, stronger whole number bias: Evidence from decimal comparison in a negative priming paradigm

Piper Rennerfeldt[1], Arnaud Viarouge[2], Gregoire Borst[2], Miriam Rosenberg-Lee[1]
1 Rutgers University - Newark, United States of America
2 Université Paris Cité, France

20. Differential effectiveness of mathematics interventions by incoming language skills: A systematic review

Vishakha Agrawal[1], BrittanyLee N. Martin[1], Allyson L. Hayward[1], Marcia A. Barnes[1]
1 Vanderbilt University, United States of America

21. Evaluating the effects of a storybook reading and guided play intervention on individual mathematical language terms

Suzanne Varnell[1], Sara A. Schmitt[2], Jessica A. R. Logan[3], David J. Purpura[1]
1 Purdue University, United States of America
2 University of Oregon, United States of America
3 Vanderbilt University, United States of America

22. Examining the role of broader word interpretation skills in the relation between number word interpretation and early childhood mathematical ability

Elena Busick[1], Michèle Mazzocco[1]
1 Institute of Child Development, University of Minnesota, United States of America

23. Gender differences in toddlers' spatial reasoning skills and spatial language

Joei Camarote[1], Yushu Zuo[2], Jazelle Pilato[2], Kalina McNeil[2], Elizabeth Votruba-Drzal[1-2], Heather Bachman[2-3], Melissa Libertus[1-2]
1 Department of Psychology, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh PA, USA
2 Learning, Research, and Development Center, University of Pittsburgh, Pittsburgh PA, USA
3 Department of Health and Human Development, School of Education, University of Pittsburgh, Pittsburgh PA, USA

24. The importance of domain-general cognitive skills for early math development in Chinese children

Yuen Pui Tam[1], Dénes Szücs[1], Xiangzi Ouyang[2]
[1] Centre for Neuroscience in Education, Department of Psychology, University of Cambridge
[2] Department of Psychology, Lingnan University

25. TagNum – An R tool for automatic stimuli creation and error analysis of numeral transcoding data

Srđan Tomić[1], Javier García-Orza[2], Cristina Gutiérrez-Fernández[2], Ismael Gutiérrez-Cordero[2], Noelia Boza Valencia[2]
1 University of Groningen, The Netherlands
2 University of Málaga, Spain

26. Explaining anomalous distance effects in fractions through number ;ine representations

Nicole Careen[1], Darcy Hallett[1]
1 Memorial University of Newfoundland, Canada

27. Exploring students' misconceptions about fractions and decimals

Bethany Rittle-Johnson[1], Rebecca Adler[1-2], L Burleigh[3], Kelley Durkin[1]
1 Vanderbilt University
2 UCLA
3 The Learning Agency

28. Longitudinal changes in how brain regions communicate during number processing in developmental dyscalculia

Simone Schwizer Ashkenazi[1-3], Ursina McCaskey[1,3], O'Gorman Tuura Ruth[1,3], Karin Kucian[1-4]
1 Center for MR-Research, University Children's Hospital Zurich, Switzerland
2 University Research Priority Project (URPP): Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
3 Children's Research Center, University Children's Hospital Zurich, Switzerland
4 Neuroscience Center Zurich, University of Zurich and ETH Zurich, Switzerland

29. Neurochemical insights into dyscalculia: Higher glutamate levels in the intraparietal sulcus are linked to math difficulties in children

Olivia Schmid[1-3,5-6], Ruth O'Gorman Tuura[1,3-4], Ursina McCaskey[1,3], Caroline Biegel[1,3-5], Karin Kucian[1,3-5]
1 Center for MR-Research, University Children's Hospital Zurich, Switzerland
2 Department of Health Sciences and Technology, ETH Zurich, Switzerland
3 Children's Research Center, University Children's Hospital Zurich, Switzerland
4 Neuroscience Center Zurich, University of Zurich and ETH Zurich, Switzerland
5 University Research Priority Project (URPP): Adaptive Brain Circuits in Development and Learning (AdaBD), University of Zurich, Switzerland
6 Zurich Center for Neuroeconomics, Department of Economics, University of Zurich

30. Number processing in mathematical learning difficulties: cognitive, ordinal and cardinal abilities

Anna M. C. Karlsson[1], Mikael Skagenholt[1-3], Ulf Träff[1], Kenny Skagerlund[1-2]
1 Department of Behavioural Sciences and Learning, Linköping University, Linköping, Sweden
2 Center for Social and Affective Neuroscience, Department of Clinical and Experimental Medicine, Linköping University, Linköping, Sweden

3 JEDILab, Division of Economics, Department of Management and Engineering, Linköping University, Linköping, Sweden

31. Processing costs of fraction comparisons across different scales

Brian Rivera[1]
1 St. Olaf College, United States of America

32. Word-problem solving and arithmetic at ages 4 and 5: the role of finger use

Karine Mazens[1], Uliana Timina[1], Fanny Gimbert[2], Marie-Caroline Croset[3]
1 Univ. Grenoble Alpes, CNRS, LPNC, France
2 Univ. Grenoble Alpes, LaRAC, France
3 Univ. Grenoble Alpes, CNRS, LIG, France

33. Differentiation between very large numerosities in infants revealed by optic flow

Belde Mutaf Yildiz[1], Jin Wang[1], Ruud van der Weel[1], Audrey van der Meer[1]
1 Norwegian University of Science and Technology, Norway

34. Implicit statistical learning of Brazilian children with developmental dyscalculia

Roseline Ardiles[1-2], Eda Custodio[2], Flavia H. Santos[3], Inês Salomé Morais[4], Diego Guevara[5]
1 Continental Florida University (CFU)
2 Universidade de São Paulo (USP)
3 University College Dublin (UCD)
4 Universidade do Algarve (UAlg)
5 University of Central Florida (UCF)

35. The role of early numeracy in Kindergarten in the learning of place value in the first grade

Zein Katkhouda[1], Monyka L. Rodrigues[1], Julie Houle[2], Arielle Orsini[1], Helena P. Osana[1]
1 Concordia University, Canada
2 Lester B. Pearson School Board

36. Equal-sign understanding in students with mathematics difficulty: A quantile and error analysis

Kayla Garvais[1], Audrey Merat[1], Jason Tibbits[1], JInyoung Heo[1]
1 University of Texas at Austin, United States of America

37. Conceptualizing fraction magnitude with fraction equivalence using a novel fraction comparison task

Siu Kwan Antonius Tam[1], Daniel Ansari[1]
1 Western University, Canada

Poster Session 4

Wed, 24 Jun 2026, 17:00-17:45 | CLA first floor

1. Tangible mathematics in Global South classrooms: appropriation and strategy development in early number composition

Fernando Gonzalez Perilli[1], Ana Cristina Pires[2]
1 Universidad de la República, Uruguay
2 Interactive Technologies Institute, Instituto Superior Técnico, Universidade de Lisboa

2. Counting or retrieving: the role of shifting in basic arithmetic

Kyria Chignier[1], Benoît Lemaire[1], Karine Mazens[1]
1 Univ. Grenoble Alpes, CNRS, LPNC, France

3. Transcribble: user-friendly AI transcription in math development and language research

Sivan Lurie[1], Noah Jaffe[1], Geetha Ramani[1]
1 University of Maryland, College Park, United States of America

4. "What I say is not what I do" revisited: a longitudinal investigation of gender differences in the Chinese home mathematics environment

Jike Qin[1], Xinyun Lyu[1], Zhiyu Yin[1]
1 Xi'an Jiaotong-Liverpool University, China

5. Numeracy learning through the Canadian TOYBOX intervention project

Nerissa Rieu[1], Camryn Kowalchuk[1], Tegwen Bryan[1], Madison Young[2], Paulette Trémorin[3], Paul Betts[1], Sheri-Lynn Skwarchuk[1]
1 The University of Winnipeg, Canada
2 University of Manitoba
3 Université de St. Boniface

6. Fathers' experiences in the Home Numeracy Environment

Heather Lyle[1], Judith Wylie[1], Katrina McLaughlin[1]
1 Queen's University Belfast, United Kingdom

7. Identifying minimal essential predictors of long-term academic trajectories: a multi-method investigation of early academic competencies and environmental factors

Elizaveta Kolyada[1]
1 Aston University, United Kingdom

8. Assess the relationship between home numeracy activities and children´s complex math skills

Daniela Susana Paz García[1], Carolina Jiménez Lira[1], Ulises Xolocotzin Eligio[2], Ana María Medrano Moya[2], Elia Verónica Benavides Pando[1], María Inés Susperreguy[3], Humberto Blanco Vega[1], Fernando Mondaca Fernández[1], Ma. Concepción Soto Valenzuela[1], Venera Gashaj[4]
1 Autonomous University of Chihuahua, Mexico
2 Cinvestav, Mexico
3 Pontifical Catholic University of Chile
4 University of Teacher Education in Special Needs

9. Cognitive differences in expert and novice programmers: a replication and extension

Alissa McGill[1], Clarissa Thompson[1]
1 Kent State University, United States of America

10. The problem with words: Why metacognitive prompts can increase word-problem accuracy, but not fraction arithmetic accuracy.

Dan Scheibe[1-2], Clarissa Thompson[2]
1 The College of Wooster, United States of America
2 Kent State University

11. Math anxiety effects on explicit and implicit measures of metacognitive monitoring

Àngels Colomé[1], M.Isabel Núñez-Peña[1]
1 Faculty of Psychology, University of Barcelona, Spain

12. Math anxiety and math achievement: A preregistered update meta-analysis of Barroso et al. (2021)

Charles Chiu Hung Yip[1-2], Jumi Lam[3], Rayto Chan[1], Denes Szucs[2], Terry Tin-Yau Wong[1]
1 Department of Psychology, The University of Hong Kong
2 Department of Psychology, University of Cambridge, United Kingdom
3 Faculty of Education, The University of Hong Kong, Hong Kong
4 Department of Psychology, The University of Hong Kong, Hong Kong

13. Assessing mathematics anxiety in students: a review of questionnaires used in recent empirical research

Jana Filek[1], Moritz Herzog[1]
1 Universität zu Köln, Germany

14. Math anxiety experience of undergraduate students: A qualitative study

Saeeda Khanum[1], Iqra Ali Mirza[1], Zain ul Abidin[1], Zainab sajid[1]
1 National University of Sciences and Technology, Pakistan

15. Do individual differences in cognitive and affective components of spatial processing explain sex/gender differences in math anxiety in children?

Linda Arrighi[1], H. Moriah Sokolowski[2], Markus Hausmann[1], Anna A. Matejko[1]
1 Durham University, UK
2 Toronto Metropolitan University

16. Collective cognitive resources: The role of collaboration in worked example learning

Christina Barbieri[1], Elena Silla[1], Gabriella Morra[1], Dana Miller-Cotto[2]
1 University of Delaware, United States of America
2 University of California, Berkeley, United States of America

17. Breaking the vicious cycle: the effectiveness of brief cognitive-behavioural interventions for math anxiety and math performance in adolescents.

Dominika Lipińska[1], Monika Szczygieł[1]
1 Institute of Psychology, Jagiellonian University in Krakow, Poland

18. Understanding students' anxiety and motivation in digital game-based mathematics learning: A systematic review of primary school evidence

Qianhong Zeng[1], Deborah Devis[1], Rebecca Marrone[1], Nguyen Nhu Anh Le[1], Florence Gabriel[1]
1 Centre for Change and Complexity in Learning, Adelaide University, Australia

19. Gender differences in children's mathematics performance: Indirect effects of spatial ability and affective factors across domains

Chloe Oi Ying Leung[1], Marian Hickendorff[1], Dietsje Jolles[1]
1 Leiden university, Netherlands

20. Examining students' emotions during math task performance using facial expressions analysis and self-reports

Alina Pavlova[1], Johan Korhonen[2], Egon Werlen[3], Sören Andersson[2], Daniel Ventus[2], Hanna Järvenoja[1], Riikka Mononen[1]
1 University of Oulu, Oulu, Finland
2 Åbo Akademi University, Vaasa, Finland
3 Swiss Distance University of Applied Sciences (FFHS), Brig, Switzerland

21. Effects of a guided play-based intervention on mathematics self-efficacy and teaching practices in early childhood education

Yovanna Galaz-Nowajewski[1-2], Christian Peake[1]
1 Universidad Diego Portales, Chile
2 Universidad Alberto Hurtado, Chile

22. Can I do it?: Effects of Math Affirmations on Math Arithmetic depend on Mastery Experiences and Math Anxiety

Julianna Hakel[1], Samuel Pearl[2], Nicole McNeil[1], Pooja Sidney[2]
1 University of Notre Dame, United States of America
2 University of Kentucky, United States of America

23. When math anxiety impairs performance: the role of monitoring and avoidant coping strategies

Sophia MacKeigan[1], Michael Slipenkyj[2], Nathan T.T. Lau[3], Moriah Sokolowski[1]
1 Department of Psychology, Toronto Metropolitan University, Canada
2 Department of Cognitive Science, Carleton University, Canada
3 Department of Psychology, University of Macau, China

24. Protocol for evidence and gap map review on numerical assessments in health care

Yael Benn[1], Georgios Kountouriotis[1], Caroline Newton[2]
1 Manchester Metropolitan University, United Kingdom
2 University College London, United Kingdom

25. Gender gaps in early mathematical cognition and the influence of teacher bias

Paola García[1], Daiana Ávila[1], Alejandro Maiche[1]
1 Centro Interdisciplinario en Cognición para la Enseñanza y el Aprendizaje (CICEA), Universidad de la República, Uruguay

26. Operational versus relational views: Exploring how understanding of the equals sign relates to equivalence performance

Phoebe Mills[1], Sabrina Di Lonardo Burr[2], Lisa Jane Rodgers[1], Ella Denvir[1], Judith Wylie[1], Chang Xu[1]
1 Queen's University Belfast, United Kingdom
2 The University of Sheffield, United Kingdom

27. Preschoolers switch between small and large numerosities without cognitive cost in non-symbolic arithmetic

Yujia Zhang[1], Annamaria Porru[2], Lucia Regolin[3], Daniela Lucangeli[2], Rosa Rugani[3], Silvia Benavides-Varela[2,4]
1 Department of Psychology, The Ohio State University, Columbus, USA
2 Department of Developmental Psychology and Socialization, University of Padova, Italy
3 Department of General Psychology, University of Padova, Italy
4 Padova Neuroscience Center, University of Padova, Italy

28. Reliability of the Approximate Number System in Preschoolers: The Role of Indicators, Calculation Methods, and Number of Trials

Monika Szczygieł[1], Tomasz Smoleń[2], Elżbieta Szpakiewicz[3], Natalia Hetman[1], Wiktor Zieliński[1,4], Attila Krajcsi[5]
1 Institute of Psychology, Jagiellonian University in Kraków, Poland
2 Centre for Cognitive Science, Jagiellonian University in Kraków, Poland
3 Institute of Psychology, University of the National Education Commission, Poland
4 Doctoral School of Social Sciences, Jagiellonian University in Kraków, Poland
5 Cognitive Psychology Department, Eötvös Loránd University, Hungary

29. A research-practice partnership to improve arithmetic fluency in Canadian classrooms

Mike McMann[1], Gilbert Morris[1], Heather Douglas[2], Rebecca Merkley[2], Jo-Anne LeFevre[2]
1 Fort Vermilion School District, Canada
2 Carleton University, Canada

30. Fadeout of mathematics intervention effects for students with learning disabilities: Exploring pathways to persistence

Gabriella Lyth Donofrio[1]
1 University of Missouri, United States of America

31. Examining fraction arithmetic knowledge growth of elementary students with mathematics difficulty

Allison Dennis McClure[1], Leanne Ketterlin Geller[1]
1 Southern Methodist University, United States of America

32. Do students learn less when self-regulating their math learning?

Rebecca Adler[1-2], Xinran Wang[2], Cristina Zepeda[2], Bethany Rittle-Johnson[2]
1 UCLA
2 Vanderbilt University

33. Magnitude Processing Phenotypes in Chinese children: the Role of Severity and Nature of Deficits for Disentangling Theoretical Constructs

Xiujie Yang[1], Jiao He[1], Flavia Santos[2], Xin Cui[1]
1 Beijing Normal University, China
2 University College London, UK

34. Fostering strategy flexibility by interleaved practice with explicit and implicit comparison

Katharina Loibl[1], Cagla Dikme[1], Frank Reinhold[1], Jon Star[2], Timo Leuders[1]
1 University of Education Freiburg, Germany
2 Graduate School of Education, Harvard, USA

35. Domain-general and domain-specific predictors of prealgebra competence for students with versus without mathematics learning difficulties

Jessica Namkung[1], Peng Pengpen[2], Natalie Koziol[3], Wendy Smith[3]
1 University of Delaware, United States of America
2 The University of Texas at Austin
3 University of Nebraska-Lincoln

36. Introducing "Fraction Finder," an AI-enabled tool for selecting and analyzing fraction magnitude comparison stimuli

Noah Mea[1], Anastasia Grubyak[1], Juan Gavilanes[1], Miriam Rosenberg-Lee[2], Lauren Schiller[1]
1 Kean University, United States of America
2 Rutgers University-Newark, United States of America

37. Investigation of within- and cross-notation neural activation for fractions, percentages, and whole numbers

Lauren Schiller[1], Piper Rennerfeldt[2], Roberto Abreu-Mendoza[3], Jennifer Chen[1], Karen Woodruff[1], Clarissa Thompson[4], Miriam Rosenberg-Lee[2]
1 Kean University, United States of America
2 Rutgers University-Newark, United States of America
3 Indiana University- Bloomington, United States of America
4 Kent State University, United States of America

38. Mathematical cognitive and executive function development in inclusive early childhood education

Annie Yuen[1]
1 Easy Zone Education

Poster Session 5

Thu, 25 Jun 2026, 13:15-14:00 | CLA first floor

1. A Preliminary Investigation of a Large Corpus of Proofs

David Barack[1], Colin Allen[2], Simon DeDeo[1,3]
1 Carnegie Mellon University, Pittsburgh, PA, United States of America
2 University of California, Santa Barbara, CA, United States of America
3 Sante Fe Institute, Sante Fe, NM, United States of America

2. A reinforcement learning–cognitive control hybrid model explains math avoidance in high-anxiety individuals

Abolfazl Mohammadian[1], Leyla Rastgar-Farajzadeh[2]
1 Department of Psychology, Faculty of Humanities, Shahed University, Tabriz, Iran
2 Department of Neurosciences and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

3. A review of the use of gamification in mathematics education

Amanda George[1], Darcy Hallett[1]
1 Memorial University of Newfoundland, Canada

4. Abacus mental arithmetic training enhances calculation and cognitive skills in children: A longitudinal study

Shiying Liu[1], Xinlin Zhou[1]
1 Beijing Normal University, China

5. Adults' arithmetic strategy choice in simple addition and subtraction

Xinhe Zhang[1], Elizabeth Gunderson[1]
1 Indiana University, United States of America

6. Are spontaneous self-affirmation and adverse childhood experiences associated with math anxiety and math performance?

Melissa Mujicic[1], Jennifer M. Taber[1], John Gunstad[1], Karin G. Coifman[1], Clarissa A. Thompson[1]
1 Kent State University, United States of America

7. Better together? The effects of socially interactive mathematics activities

Aryn Vaughan[1], Nicole Scalise[1]
1 Washington State University, United States of America

8. Beyond overall achievement: strand-level patterns in children's mathematics development

Hillary Mastarciyan[1], Michael Slipenkyj[2], Lien Peters[3], Moriah Sokolowski[1,4]
1 Department of Psychology, Toronto Metropolitan University, Toronto, Canada
2 Department of Cognitive Science, Carleton University, Ottawa, Canada
3 Department of Experimental Clinical & Health Psychology, Ghent University, Ghent, Belgium
4 Rotman Research Institute, Baycrest Health Sciences, Toronto, Canada

9. Different moderating roles of parental numeracy expectations and values in the relation between home numeracy activities and children's numeracy skills

Keyue Li[1], Chang Xu[2], Jike Qin[3], Wei Wei[1]
1 Zhejiang University, China
2 Queen's University Belfast, United Kingdom
3 Xi'an Jiaotong-Liverpool University, China

10. Ecological assessment of physiological responses to mathematics in early secondary school students

Riccardo Pagan[1], Rachele Lievore[1], Luca Menghini[2], Alice Masi[1], Irene Cristina Mammarella[1], Sara Caviola[1]
1 Department of Developmental and Social Psychology, University of Padova, Italy
2 Department of General Psychology, University of Padova, Italy

11. How can children report their math motivation? Evidence from a digital assessment tool

Kamila Schulz[1], Christian Peake[2], Valeska Grau[1], Yovanna Galaz-Nowajewski[2]
1 School of Psychology, Pontificia Universidad Católica de Chile, Chile
2 Faculty of Education, Universidad Diego Portales, Chile

12. How music influences mathematical anxiety: a theoretical model

Ricardo Sousa Santos[1], Marcos Guilherme Moura-Silva[2]
1 Federal University of Northern Tocantins
2 Federal University of Pará

13. Investigating the origins of math anxiety in preschoolers

Erica Roberts[1], Stephanie Bugden[1]
1 University of Winnipeg, Canada

14. Is math anxiety contagious? A meta-analysis of home and classroom contributors to children's math anxiety and achievement

Julia Gervasio[1], Mariana Zapounidis[1], Ryan Persram[1], H. Moriah Sokolowski[1-2]
1 Toronto Metropolitan University, Canada
2 Rotman Research Institute, Baycrest Hospital

15. Long-term memory's relation to math in the context of math anxiety

Cynthia Fioriti[1], Analia Marzoratti[2], Anna Ballantyne[2], Tanya Evans[2], Ian Lyons[1]
1 Georgetown University, United States of America
2 University of Virginia, United States of America

16. Low math anxiety prevents math achievement decline for urban but not rural Chinese schoolchildren

Artem Malykh[1-2], Anna Pavlova[1-3], Ying Zhen[4], Chungang He[4], Haiying Yu[4], Sergey Malykh[1]
1 Russian academy of Education, Russian Federation
2 Ural Federal University, Russian Federation
3 HSE University, Russian Federation
4 Mudanjiang Normal University

17. Mathematics anxiety and mathematical performance in early childhood: A systematic review

Esmeralda Dionicio[1-2], María Inés Susperreguy[1-2]
1 Faculty of Education, Pontificia Universidad Católica de Chile
2 Millennium Nucleus for the Study of the Development of Early Math Skills (MEMAT)

18. Multidimensional development of mathematics learning engagement in elementary school: The roles of perceived school climate and mathematics attitudes

Xingfeng Zhuo[1], Kaiyue Guo[2], Hongting Lv[1], Mengru Qiu[2], Yanli Xu[1], Yuxuan Wu[2], Jiwei Si[1]
1 Faculty of Psychology, Shandong Normal University,Jinan, Shandong, China
2 Shandong Provincial Key Laboratory of Brain Science and Mental Health, Jinan, Shandong, China

19. Mutual mediation pathways link mathematics achievement to cognitive and affective math anxiety beyond adolescence into adulthood with varied working memory moderations

Chin-Yuan Chang[1], Wen-Chi Chiang[1]
1 National Chung Cheng University, Taiwan

20. Longitudinal neuroplasticity of the intraparietal sulcus mediates home math environment effects on children's numerical development

Leyla Rastgar-Farajzadeh[1], Masoud Mehdizadeh[2], Abolfazl Mohammadian[3]
1 Department of Neurosciences and Cognition, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran
2 Department of Cognitive Neuroscience, Faculty of Educational Sciences and Psychology, Tabriz University, Tabriz, Iran
3 Department of Psychology, Faculty of Humanities, Shahed University, Tabriz, Iran

21. More is not always better: executive function moderates the effect of parental mathematical talk on children's math ability across developmental stages

Tian Rui Li[1], Fang Qin He[1], Na Hu[1-2], Dan Cai[1-2]
1 School of Psychology, Shanghai Normal University, China
2 Lab for Educational Big Data and Policymaking, Ministry of Education, PR China

22. Neural representations of non-symbolic magnitudes show familial specificity in the right intraparietal sulcus

Charlotte Constant-Varlet[1], Tomoya Nakai[2-3], Léa Longo[1], Honorine Bouchet[1], Jérôme Prado[1]
1 Centre de Recherche en Neurosciences de Lyon (CRNL), INSERM U1028 - CNRS UMR5292, Université de Lyon, France
2 Araya Inc., 101-0025 Tokyo, Japan
3 LaPsyDÉ, CNRS UMR8240, Université Paris Cité, France

23. Optimizing a gamified intervention for arithmetic fluency through number-ordering trial design

Jiahe Wang[1], Terry Tin-Yau Wong[1]
1 The University of Hong Kong, Hong Kong S.A.R., China

24. A 6-week individual math anxiety intervention for college students

Kaitlyn Brown[1], Pooja Sidney[1]
1 University of Kentucky, United States of America

25. When numbers become threats: Mathematics anxiety selectively disrupts proactive inhibitory control in adolescents

Sarah Urbain[1-3], Jean-François Maes[1-3], Amandine Leboutte[1-3], Erika Wauthia[1-3]
1 Ecole de Formation des Enseignants, Université de Mons, Belgium
2 Institut de recherche pour le Développement sociétal et territorial (SOCI&TER), Université de Mons, Belgium
3 Institut de recherche en Systèmes Complexes (COMPLEXYS), Université de Mons, Belgium

26. Thinking through math: metacognitive supports, strategy use, and math anxiety

Sharon Jaramillo[1], Clarissa Thompson[1]
1 Kent State University, United States of America

27. ONE programme, many classrooms: practitioners' perspectives on successes, challenges, and adaptations

Liza Kahwaji[1], Rosemary O'Connor[2], Zachary Hawes[3], Steven J. Howard[4], Rebecca Merkley[1], Victoria Simms[5], Emma Blakey[6], Gaia Scerif[2]
1 Department of Cognitive Science, Carleton University, Canada
2 Department of Experimental Psychology, University of Oxford, UK
3 Department of Applied Psychology and Human Development, University of Toronto, Canada
4 Early Start and School of Education, University of Wollongong, Australia
5 Centre for Mathematical Cognition, Loughborough University, UK
6 School of Psychology, University of Sheffield, UK

28. Short-term effects of a large-scale tutoring program on middle school students' mathematical performance: Evidence from adaptive assessments

Araê Cainã[1], Gisele Magaroto[1], Mônica Andrade Weinstein[2]
1 CATvante, Brazil
2 Parceiros da Educação, Brazil

29. Translating research to practice: developing and evaluating an integrated number sense screener for classrooms

Juan Gavilanes[1], Noah Meah[1], Anastasia Grubak[1], Lauren Schiller[1]
1 Kean University, United States of America

30. Do metacognitive-supportive exit tickets in high school math classrooms improve students' self-regulated learning?

Xinran Wang[1], Jerry Nelluvelil[2], Madeleine Kingan[2], Edith Garner[1], Rebecca Adler[3], Cristina Zepeda[1], Jon Star[2], Bethany Rittle-Johnson[1], Kelley Durkin[1]
1 Vanderbilt University, United States of America
2 Harvard University, United States of America
3 University of California, Los Angeles, United States of America

31. Examining factor structures on the Test of Early Mathematics Ability-3: A statistical replication

Hailey Kepiro[1], Anna-Mari Fall[2], Marcia Barnes[1]
1 Vanderbilt University, United States of America
2 University of Austin at Texas, United States of America

32. Math assessment in the classroom: Navigating the considerations, challenges, and opportunities associated with developing a digital numeracy screener

Charles Anifowose[1], Michele Fridman[1], Ebrahim Talaee[1], Sabrina Shajeen Alam[1], Michael Slipenkyj[2], Tae Bourque[2], Rebecca Merkley[2], Heather Douglas[3], Jo-Anne Lefevre[3]
1 Vretta Inc., Canada
2 Department of Cognitive Science, Carleton University
3 Department of Psychology, Carleton University

33. Spontaneous focus on numerosity and mathematics achievement: A meta-analysis

Xiangzi Ouyang[1], Charles Chiu Hung Yip[2], Jenny Yun-Chen Chan[3], Terry Tin-Yau Wong[2]
1 Lingnan University, United States of America
2 The University of Hong Kong, Hong Kong S.A.R., China
3 The Educational University of Hong Kong, Hong Kong S.A.R., China

34. Comparing AI-Driven and Teacher-Curated Pathways in Digital Mathematics Remediation Platform: Evidence from a Large-Scale Study.

Margot Röell[1], Catherine de Vulpillières[1], Pierre-Yves Oudeyer[1-2]
1 EvidenceB, France
2 INRIA, Bordeaux, France

35. Should students count on their fingers? Preservice teachers' beliefs in French-speaking Belgium

Jean-François Maes[1,4-5], Maëlle Neveu[2], Laurence Rousselle[3], Erika Wauthia[1,4-5]
1 Ecole de Formation des Enseignants, université de Mons, Belgium
2 Service d'Orthopédagogie clinique, Faculté de Psychologie et des Sciences de l'Education, Université de Mons Belgium
3 Research Unit for a life-Course perspective on Health & Education (RUCHE), Université de Liège, Belgium
4 Institut de recherche pour le Développement sociétal et territorial (SOCI&TER), Université de Mons, Belgium
5 Institut de recherche en Systèmes Complexes (COMPLEXYS), Université de Mons, Belgium

36. The implementation gap: translating evidence into adaptive instructional practices. An evaluation of teacher data-based decision-making processes

Nicole Reinsdorf[1], Antje Ehlert[1]
1 Universität Potsdam, Germany

37. Exploring the effectiveness of word-problem strategy and strategy combinations: a systematic review and network meta-analysis

Yuting Liu[1], Peng Peng[2]
1 Shanghai Normal University, China
2 University of Texas at Austin, USA

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