

**The 1st Mathematical Cognition and Learning
Society Conference**

**8th and 9th of April 2018
Examination schools, Oxford (UK)**

Organisers:

Roi Cohen Kadosh
Francesco Sella

Conference committee members:

Bert De Smedt
Martin Fischer
Jo-Anne LeFevre
Robert Reeve
Xinlin Zhou

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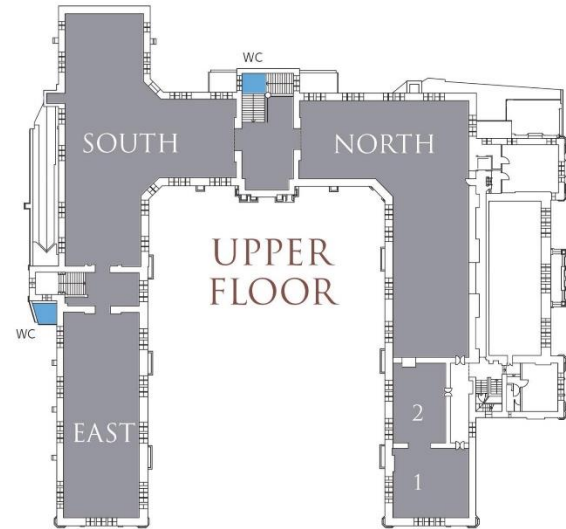
Registration desk: Great hall.

Symposia/Parallel sessions: South school, East school, Room 6 and Room 7.

Poster session/Refreshments: North school.

Speakers' room: Room 10.

Luggage deposit: Room 8.



Sunday 8th

Time	Great Hall	North school	South school	East school	Room 6	Room 7
8:00 – 8:30	Registration					
8:30 – 10:00			Symposium: Math and Spatial Anxiety: Correlates and Consequences across Development (Organiser: Ganley)	Parallel session: Numerical Processing 1 (Chair: Schiltz)	Parallel session: Maths Achievements 1 (Chair: Noël)	
10:00 – 10:30		Coffee/tea break				
10:30 – 12:00			Featured Symposium: Is there (really) an evolved capacity for number? (Organiser: Núñez)			
12:00 – 14:00		Lunch + Poster session 1	12:30-13:15 A lunch with the President: a discussion about MCLS with Prof Ashcraft.			
14:00 – 15:30			Symposium: Preschool Foundations of Emerging Mathematics: Building interdisciplinary bridges across children’s cognition, the preschool and the home educational environment (Organiser: Scerif)	Symposium: Number words and Arabic digits: development and cross-linguistic differences (Organiser: Göbel)	Parallel session: Arithmetic and beyond 1 (Chair: LeFevre)	
15:30 – 16:00		Coffee/tea break				
16:00 – 17:30			Symposium: Spontaneous focusing on numerical aspects and the development of mathematical skills (Organiser: Nanu)	Symposium: Mathematics anxiety: Going a few steps further (Organiser: Morsanyi)	Parallel session: Maths Achievements 2 (Chair: Garcia-Orza)	Parallel session: Arithmetic and beyond 2 (Chair: Klingberg)
	Museum of Natural History					
18:00 – 19:30	Drinks reception					

Monday 9th

Time	North school	South school	East school	Room 6	Room 7
8:30 – 10:00		Symposium: Arithmetic and Reading: Related Building Blocks (Organisers: Peters; Vanbinst)	Parallel session: Numerical Processing 2 (Chair: de Hevia)	Parallel session: Education (Chair: Jordan)	
10:00 – 10:30	Coffee/tea break				
10:30 – 12:00		Symposium: Accessing rational numbers – Nature and nurture (Organisers: Hubbard; McMullen; Matthews)	Symposium: Reliability and validity of the SNARC effect. (Organisers: Fias; van Dijck)	Parallel session: Arithmetic and beyond 3 (Chair: Henik)	
12:00 – 14:00	Lunch + Poster session 2	12:30-13:15 A lunch with the Editors: Dr Towse and Dr Sarnecka to discuss the Journal of Numerical Cognition and preregistered reports.			
14:00 – 15:30		Symposium: The development of symbolic fraction knowledge – Processes and proponents (Organisers: McMullen; Matthews; Hubbard)	Symposium: Math Anxiety: from psychophysiology to interventions, through genetic and learning (Organisers: Caviola; Dowker)	Parallel session: Numerical Processing 3 (Chair: Hannula-Sormunen)	
15:30 – 16:00	Coffee/tea break				
16:00 – 17:30		Symposium: Foundations for fractions – Non-symbolic ratio processes and relational reasoning (Organisers: Matthews; Hubbard; McMullen)	Symposium: Unpacking the Role of Numerical Ordinal Processing in the Development of Early Math Abilities (Organisers: Xu; Lyons)	Parallel session: Maths Achievements 3 (Chair: Rosenberg-Lee)	Parallel session: Philosophy (Chair: Sloman)
17:45 – 18:45		MCLS Business Meeting (open to all members)			

Sunday 8th

Time: 8:00 – 8:30 / Room: Great hall / **Registration**

Time: 8:30 – 10:00 / Room: South School / Symposium: **Math and Spatial Anxiety: Correlates and Consequences across Development** / Organiser: Coleen Ganley

Talk 1: Affective Correlates of Math and Spatial Performance During Elementary School: Gender Differences and Predictive Specificity - Jillian E. Lauer; Alena G. Esposito; Patricia J. Bauer

Talk 2: Age Differences in Children's Attitudes to Mathematics and Mathematics Anxiety - Ann Dowker; Olivia Cheriton; Rachel Horton

Talk 3: Examining Potential Bidirectional Relations between Math Anxiety and Performance in Elementary School - Colleen M. Ganley; Amanda L. McGraw; Connie Barroso; Elyssa A. Geer

Talk 4: Reciprocal Relations Among Motivational Frameworks, Math Anxiety, and Math Achievement in Early Elementary School - Elizabeth A. Gunderson; Daeun Park; Erin A. Maloney; Sian L. Beilock; Susan C. Levine

Talk 5: Math Anxiety in U.S. Adults: Prevalence and Correlates - Sara A. Hart; Colleen M. Ganley

Talk 6: Spatial Anxiety Scale – A Novel Tool with Applications for STEM Education - Ian M. Lyons; Richard J. Daker; Moriah Sokolowski; Zachary Hawes; Gerardo Ramirez; Erin A. Maloney; Danielle N. Rendina; Susan C. Levine; Sian L. Beilock

Time: 8:30 – 10:00 / Room: East School / Parallel session: **Numerical processing 1** / Chair: Christine Schiltz

Talk 1: Role of domain-general processes in numerosity estimation: A life-span study of congruency effects and their sequential modulations in dot comparison tasks - Patrick Lemaire; Angélique Roquet; Celine Poletti

Talk 2: The Evolutionary Role of Continuous Magnitudes in Magnitude-Related Decisions - Tali Leibovich-Raveh; Shai Gabay

Talk 3: Simulating the approximate number system with deep learning: Role of continuous visual cues and emergent encoding of numerosity - Alberto Testolin; Marco Zorzi

Talk 4: Non-numerical cues are (roughly) irrelevant to determining the content of our numerical thoughts - Justin Halberda

Talk 5: Understanding prices: Electrophysiological evidence of fully compositional analysis - Fernando Ojedo; Pedro Macizo

Talk 6: Finger dexterity of the pointing hand is linked to dot counting abilities - Catherine Thevenot; Nolwenn Guedin

Time: 8:30 – 10:00 / Room: Room 6 / Parallel session: **Maths achievements 1** / Chair: Marie-Pascale Noël

Talk 1: Identifying children with persistent low math achievement throughout elementary school years - Terry Tin-Yau Wong; Winnie Wai-Lan Chan; Gary Kam-Chun Tam

Talk 2: Persistent mathematics learning difficulties from childhood to adolescence in very preterm children - Sarah Clayton; Lucy Cragg; Camilla Gilmore; Neil Marlow; Victoria Simms; Rebecca Spong; Samantha Johnson

Talk 3: Complexity and plasticity of number processing in a case of developmental dyscalculia - Vitor Haase; Maria Raquel S. Carvalho; Borges Júlia; Isabella Starling-Alves; Giulia Moreira-Paiva

Talk 4: Relative left handedness more frequent in spelling but not in math learning difficulties: A pilot study - Maria Raquel Carvalho; Mariuche Rodrigues de Almeida Gomides; Filipe Santos; Giulia Moreira Paiva; Vitor G. Haase

Talk 5: Impaired neural processing of transitive relations in children with Math Learning Disability - Flora Schwartz, Justine Epinat-Duclos; Jessica Léone; Jérôme Prado

Talk 6: How Do We Compare Stimulus Magnitudes? Evidence from an Artificial Algebra - Randolph Grace; Anna Wilson; Simon Kemp

Time: 10:00 – 10:30 / Room: North school / **Coffee/Tea break**

Time: 10:30 – 12:00 / Room: South school / Featured Symposium: **Is there (really) an evolved capacity for number?** / Organiser: Rafael Núñez

Talk 1: The number sense and its evolutionary and developmental foundations - Elizabeth Brannon

Talk 2: Do infants really have a sense of number? - a meta-analytic approach - Daniel Ansari

Talk 3: Selective developmental deficits and its implications for the evolution of numerical abilities - Brian Butterworth

Talk 4: Counting systems as cultural tools - Andrea Bender

Talk 5: Origin and refinement of number sense in deep neural networks - Marco Zorzi

Talk 6: Quantical or numerical? Disentangling biological enculturation from biological evolution - Rafael Núñez

Time: 12:00 – 14:00 / Room: North school / **Lunch and Poster session 1**

Time: 12:30 – 13:15 / Room: South school / **A lunch with the President:** a discussion about MCLS with Prof. Mark Ashcraft, the MCLS president. Take your lunch and join the meeting.

Time: 14:00 – 15:30 / Room: South school / Symposium: **Preschool Foundations of Emerging Mathematics: Building interdisciplinary bridges across children’s cognition, the preschool and the home educational environment** / Organiser: Gaia Scerif

Talk 1: How should we study individual differences in preschoolers’ numerical abilities? - Ann Dowker; Gaia Scerif

Talk 2: Learning verbal number words relates to how children attend to numerical quantity - Moriah Sokolowski; Rebecca Merkley; Sarah Samantha Kingissepp Bray; Praja Vaikuntharajan; Daniel Ansari

Talk 3: Preschool children’s understanding of number - Camilla Gilmore; Sophie Batchelor

Talk 4: The preschool home learning environment and early number skills - Fiona Simmons; Elena Soto-Calvo; Anne-Marie Adams; Hannah Francis; Catherine Willis

Talk 5: Having the confidence to count: reported practitioner maths confidence and the use of “maths-talk” with pre-schoolers - Emma Dove; Anne Mills; Megan von Spreckelsen; Daniel Ansari; Ann Dowker; Rebecca Merkley; Victoria Murphy; Gaia Scerif; the Preschool Maths Foundation team

Time: 14:00 – 15:30 / Room: East school / Symposium: **Number words and Arabic digits: development and cross-linguistic differences** / Organiser: Silke M. Göbel

Talk 1: Symbolic Processing Mediates the Relationship between Nonsymbolic Processing and Later Arithmetic Performance - Karin Landerl; Sabrina Finke; Harald Freudenthaler

Talk 2: Semantic digit-number word mappings, independent from the ANS - Bert Reynvoet; Mila Marinova; Delphine Sasanguie

Talk 3: Number writing and its concurrent relationship with arithmetic in year 1 children: does number word inversion matter? - Francina Clayton; Anna Steiner; Karin Landerl; Silke M. Göbel

Talk 4: Number word inversion influences mental arithmetic in English-speaking adults - Julia Bahnmueller; Maier, C. A.; Silke M. Göbel; Korbinian Moeller

Time: 14:00 – 15:30 / **Room:** Room 6 / **Parallel session:** Arithmetic and beyond 1 / **Chair:** Jo-Anne LeFevre

Talk 1: Sampling Incidental Mental Arithmetic in Everyday Life with the Aid of Mobile Phones - Oliver Lindemann; Martin H. Fischer

Talk 2: Simple fractions may not be represented componentially: A rejoinder to Bonato et al (2007) - Darcy Hallett; Jillian D. Adams; Kyle R. Morrissey

Talk 3: Division as rational numbers: Is there an easier way to introduce fractions? - Arava Kallai

Talk 4: The semantic networks are involved in mathematical processing - Xinlin Zhou

Talk 5: Interactions of Space and Arithmetic: Operational Momentum in Preschool Children - Koleen McCrink; Viola Macchi Cassia; Hermann Bulf; Maria Dolores de Hevia

Time: 15:30 – 16:00 / **Room:** North school / **Coffee/Tea break**

Time: 16:00 – 17:30 / **Room:** South school / **Symposium:** Spontaneous focusing on numerical aspects and the development of mathematical skills / **Organiser:** Cristina Nanu

Talk 1: Development of numerical estimation: the role of spontaneous orientation towards different dimensions of magnitude - Arnaud Viarouge; Olivier Houdé; Grégoire Borst

Talk 2: Attention to Number: Specificity and Malleability - Michèle Mazzocco; Jenny Chan; Taylor Praus-Singh; Sarah Lukowski

Talk 3: The effect of school starting age on children's spontaneous focusing on numerosity and mathematical skills - Sophie Batchelor; Joke Torbeyns; Victoria Simms; Cristina Nanu; Eero Laakkonen; Bert De Smedt; Minna Hannula-Sormunen

Talk 4: A person-centered approach on the effects of formal mathematics education on spontaneous focusing on numerosity and basic arithmetical skill profiles - Cristina Nanu; Eero Laakkonen; Sophie Batchelor; Joke Torbeyns; Victoria Simms; Bert De Smedt; Minna Hannula-Sormunen

Talk 5: Spontaneous focusing on Arabic number symbols and its association with numerical abilities and math performance - Sanne Rathé; Joke Torbeyns; Bert De Smedt; Lieven Verschaffel

Time: 16:00 – 17:30 / **Room:** East school / **Symposium:** Mathematics anxiety: Going a few steps further / **Organiser:** Kinga Morsanyi

Talk 1: Math anxiety interferes with math learning in 6-year-old children - Carlo Tomasetto; Patrick O'Connor; Veronica Guardabassi; Kinga Morsanyi

Talk 2: Math anxiety assessment in early elementary school students - Caterina Primi; Maria Anna Donati; Viola Izzo; Kinga Morsanyi

Talk 3: Questionnaire math anxiety measurement one step further - norms and online testing; insights from Poland and Germany - Krzysztof Cipora; Christina Artemenko; Klaus Willmes; Hans-Christoph Nuerk

Talk 4: Trait and state maths anxiety, cortisol level and maths performance: Exploring the links - Kinga Morsanyi; Judith Wylie; Zoltan Molnar; Caterina Primi

Time: 16:00 – 17:30 / **Room:** Room 6 / **Parallel session:** **Maths achievements 2** / **Chair:** Javier Garcia-Orza

Talk 1: Multiple Skills Underlie Arithmetic Performance: A Large-Scale Structural Equation Modeling Analysis - Sarit Ashkenazi; Sarit Silverman

Talk 2: Children’s contextual sensitivity predicts concurrent mathematics skill - Sarah Lukowski; Michèle Mazzocco

Talk 3: Are we barking up the wrong tree? The relation between inhibitory abilities and mathematical achievement - Kerry Lee

Talk 4: Kindergarten Predictors of Mathematics: Quantitative, Working Memory and Linguistic Skills - Marcie Penner-Wilger; Rylan Waring

Talk 5: The development of number line estimation strategies - Koen Luwel; Dominique Peeters; Lieven Verschaffel

Time: 16:00 – 17:30 / **Room:** Room 7 / **Parallel session:** **Arithmetic and beyond 2** / **Chair:** Torkel Klingberg

Talk 1: Sequence Patterning Explains Individual Differences in Children's Calculation - Kelsey Mackay; Bert De Smedt

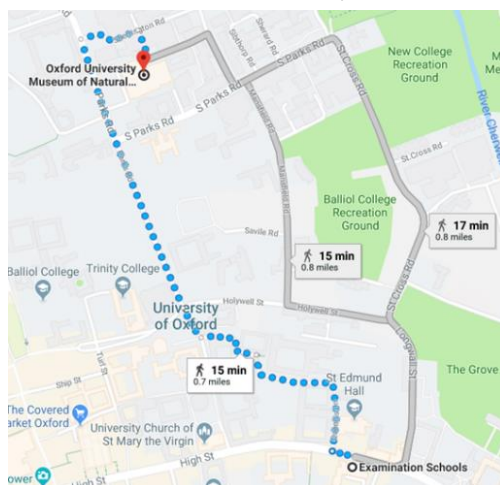
Talk 2: Development of proportional reasoning: The role of congruity and salience - Reuven Babai; Ruth Stavy

Talk 3: “Knowing how” versus “knowing that”: the relative contribution of conceptual and procedural knowledge to overall fraction and algebra performance - Felix Ayesu; Darcy Hallett; Cherryll Fitzpatrick

Talk 4: Testing a game-based learning intervention to improve arithmetic via number knowledge - Tim Jay; Jake Habgood; Martyn Mees

Talk 5: The effects of teaching mental calculation in the development of mathematical abilities - Carola Ruiz

Time: 18:00 – 19:30 / **Location:** Museum of Natural History / **Drinks reception**



Poster session 1

Day: Sunday 8th / Time: 12:00 – 14:00 / Room: North school

- 1. The processing of prices across symbolic formats** - Fernando Ojedo; María Mercedes Sánchez-Fortis; Pedro Macizo
- 2. Overcoming language barriers in early mathematics instruction with “MaGrid” - a language-neutral training tool for multilingual school settings** - Véronique Cornu; Tahereh Pazouki; Christine Schiltz; Antoine Fischbach; Romain Martin
- 3. The contribution of long term memory and working memory to the mental representation of magnitudes and letters** - Yafit Oscar
- 4. A longitudinal study on finger counting strategies in 6-years old children** - Justine Dupont; Catherine Thevenot
- 5. The relation between the understanding of different arithmetic principles and math achievement** - Kam Tai Kwan; Terry Tin-Yau Wong
- 6. Finger numeral representations contribute to acquiring number semantic** - Rosario Sánchez; Laura Matilla; Josetxu Orrantia; David Muñoz
- 7. The role of spatial numerical associations in a short-term memory task involving digits** - Jeanne Bagnoud; Pamela Banta Lavenex; Jasinta Dewi; Catherine Thevenot
- 8. Statistical learning of number pairs: an ERP study** - Ferenc Kemény; Sabrina Finke; Anna Steiner; Corinna Perchtold; Karin Landerl
- 9. The relationship between Mathematics Anxiety and Working Memory measures in mathematical and non-mathematical situations** - Ruggero De Agostini; Silke M. Göbel
- 10. Preschool Math Skills Impact Future Achievement** - Pamela Davis-Kean; Thurston Domina; Megan Kuhfeld; Alexa Ellis; Elizabeth Gershoff
- 11. Investigating White Matter Pathways in Children’s Arithmetic through Spherical Deconvolution** - Brecht Polspoel; Maaïke Vandermosten; Bert De Smedt
- 12. Do General Ordinal Relationships Account for Symbolic Number Representation in the Brain?** - Celia Goffin; Stephan Vogel; Daniel Ansari
- 13. Can we count on order when performing arithmetic and when performing mathematics?** - Helene Vos; Bert Reynvoet; Wim Gevers; Iro Xenidou-Dervou
- 14. A reliability generalization study on Test of Early Mathematics Ability across studies** - Peera Wongupparaj
- 15. Larger SNARC amplitude in high math-anxiety individuals: an evidence of worse spatial skills?** - Angels Colomé; M. Isabel Núñez-Peña
- 16. The role of the serial order short-term memory neural network in calculation abilities in children** - Lucie Attout; Steve Majerus
- 17. Eye Fixations and Number Line Estimation: The effect of an external benchmark on whole number estimation using eye-tracking** - Kelsey Mackay; Lieven Verschaffel; Filip Germeys; Koen Luwel
- 18. The Influence of Different Size Dimensions on Mental Rotation** - Lisa Beckmann; Naama Katzin; Ronit Goldman; Avishai Henik
- 19. Dyscalculic present distance effect in the mental clock task** - Yarden Glikman; Avishai Henik

20. **State- and Trait-Model of Math Anxiety** - Lars Orbach; Moritz Herzog; Annemarie Fritz
 21. **Numerical magnitude extraction process improved in children using mental abacus: evidence from ERP study** - Yuan Yao; Feiyan Chen
 22. **The Open Calculation Based on Numbers (ABN) method for learning mathematics as an alternative to the Closed Calculation Based on Ciphers (CBC)** - Carmen M. Canto; Manuel Aguilar; José I. Navarro; Carlos Mera Cantillo
 23. **Training early numerical skills: Preliminary evidence on preschoolers** - Cristina Semeraro; Rosalinda Cassibba; Daniela Lucangeli
 24. **Bidirectional estimation on the number line in kindergarteners in Chile: effect of familiarity with numbers** - Christian Peake; Cristina Rodríguez; Felipe Sepúlveda
 25. **The different developmental tendencies of gender differences in number semantic and spatial processing** - Wei Wei; Tingyan Zhang; Chen Chen
 26. **A Longitudinal Investigation of the Relations Between Spatial Skills and Math Performance in Elementary School Children** - Elyssa Geer; Jamie Quinn; Colleen Ganley
 27. **The Effects of Online Math Fact Training** - Marshal Rodrigues; Darcy Hallett
 28. **Relations between Numerical, Spatial, and Executive Function Skills and Mathematics Achievement: A Latent-Variable Approach** - Zack Hawes; Joan Moss; Beverly Caswell; Jisoo Seo; Daniel Ansari
 29. **Generating non-symbolic stimuli: An extent to Piazza's (2004) method to control for non-numerical visual cues** - Mathieu Guillaume; Christine Schiltz; Amandine Van Rinsveld
 30. **More than number sense: Associations between cognitive control, metacognition and arithmetic in primary school** - Elien Bellon; Wim Fias; Bert De Smedt
 31. **Directional magnitude ordering as a marker of understanding counting principles in preschoolers** - Maciej Haman; Katarzyna Lipowska
 32. **Patterns, Mathematics, Art and Human Relationships: Assessments and Interventions to Facilitate Progress in a Young Person on the Autism Spectrum** - Christine Lawson
 33. **When 7 is closer to 9 than to 8: an expanded measure of implicit number conception** - Rachel Jansen; Ruthe Foushee; Tom Griffiths
 34. **The Impact of Stereotype Threat on Mathematical Performance: The case of aging** - Poshita Nicolas; Patrick Lemaire; Isabelle Régner
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Monday 9th

Time: 8:30 – 10:00 / **Room:** South school / Symposium: **Arithmetic and Reading: Related**

Building Blocks / Organisers: Lien Peters; Kiran Vanbinst

Talk 1: Individual differences in (cognitive) precursors of arithmetic and reading in 5-year olds - Kiran Vanbinst; Elsje van Bergen; Pol Ghesquière; Bert De Smedt

Talk 2: Pattern understanding as a predictor of early growth in reading and arithmetic skills - Kelly Burgoyne; Stephanie Malone; Charles Hulme

Talk 3: Early childhood general knowledge: A domain-general mechanism for long-term achievement in arithmetic and reading - Tanya M. Evans; David W. Grissmer

Talk 4: Differences in cognitive profiles of children with MD, RD or MDRD - Jonna Salminen; Tuire Koponen; Kenneth Eklund; Riikka Heikkilä; Mikko Aro

Talk 5: Dyscalculia and dyslexia: Different behavioral, yet similar neural profiles - Lien Peters; Jessica Bulthé; Nicky Daniels; Hans Op de Beeck; Bert De Smedt

Talk 6: Neural bases of comorbidity of dyscalculia and dyslexia in adults - Anna Wilson; David Moreau; Reece Roberts; Karen Waldie

Time: 8:30 – 10:00 / **Room:** East school / Parallel session: **Numerical processing 2** / Chair: Maria Dolores de Hevia

Talk 1: When a million is more than infinity: The influence of the decimal structure on perceiving numbers as "large" - Michal Pinhas; Rut Zaks-Ohayon

Talk 2: The role of the left intraparietal sulcus (IPS) in tactile enumeration – Behavioral and neuroanatomical findings - Zahira Ziva Cohen; Isabel Arend; Kenneth Yuen; Sharon Naparstek; Yarden Glikzman; Ronel Veksler; Avishai Henik

Talk 3: Meta-analysis study of fMRI activation in the interference effects of Numerical Stroop Task - Patricia Freitas; Guilherme Wood

Talk 4: Symbolic estrangement or symbolic integration of numerals with quantities: Methodological pitfalls and a possible solution - Mila Marinova; Delphine Sasanguie; Bert Reynvoet

Talk 5: Spatial order relates to the exact numerical magnitude of digits in young children - Francesco Sella; Daniela Lucangeli; Roi Cohen Kadosh; Marco Zorzi

Talk 6: Roman Numerical Cognition - Sophie Batchelor; Matthew Inglis

Time: 8:30 – 10:00 / **Room:** Room 6 / Parallel session: **Education** / Chair: Nancy C. Jordan

Talk 1: Worked-out solutions to unstructured problems: A tool to support social metacognitive regulation? - Sheila Evans

Talk 2: Bridging intuitive and analytical thinking in mathematics education - Uri Leron; Lisser Rye Ejersbo

Talk 3: Visuospatial working memory in mathematical performance using Open Calculation Based on Numbers Algorithm (ABN) - Estibaliz Aragon; Manuel Aguilar; Carmen M. Canto; Carlos Mera; Candida Delgado; Gamal Cerda; Carlos Perez Wilson; José I. Navarro

Talk 4: Students' Mathematical Practices of Defining: A Piagetian Perspective - Amelia Farid; Ellen Kulinsky

Talk 5: Home numeracy and children's mathematical outcomes in Chilean preschoolers - Maria Ines Susperreguy; Jo-Anne LeFevre; Heather Douglas; Chang Xu; Natalia Molina-Rojas

Time: 10:00 – 10:30 / **Room:** North school / **Coffee/Tea break**

Time: 10:30 – 12:00 / **Room:** South school / **Symposium:** Accessing rational numbers – Nature and nurture / **Organisers:** Edward Hubbard; Jake McMullen; Percival Matthews

Talk 1: Non-Symbolic Ratio Reasoning in Children and Adults - Emily Szkudlarek; Elizabeth M. Brannon

Talk 2: Similar behavioral effects for nonsymbolic ratio processing and symbolic fractions suggests common mechanisms - Percival Matthews; Rui Meng; John Binzak; Elizabeth Toomarian; Edward Hubbard

Talk 3: Number line uni-dimensionality is key to promoting fraction representations - Elizabeth A. Gunderson

Talk 4: Do Children Understand Fraction Addition? - Jing Tian; David Braithwaite; Robert Siegler

Time: 10:30 – 12:00 / **Room:** East school / **Symposium:** Reliability and validity of the SNARC effect / **Organisers:** Wim Fias; Jean-Philippe van Dijck

Talk 1: The reliability paradox: Why robust cognitive tasks do not produce reliable individual differences - Craig Hedge; Georgina Powell; Petroc Sumner

Talk 2: Who has (a consistent) SNARC: investigating prevalence of the SNARC effect by means of estimating confidence intervals - psychometric and resampling approaches - Krzysztof Cipora

Talk 3: About the validity of the SNARC effect: The importance of working memory - Jean-Philippe van Dijck; Wim Fias

Talk 4: Flexible behavioral and neural modulations of the SNARC effects: Implications for construct validity - Philipp Alexander Schroeder; Hans-Christoph Nuerk; Christian Plewnia

Talk 5: Is the SNARC effect a valid measure of numerical skills? Insights from its relation to mathematical abilities over the lifespan - Carrie Georges; Danielle Hoffmann; Christine Schiltz

Time: 10:30 – 12:00 / **Room:** Room 6 / **Parallel session:** Arithmetic and beyond 3 / **Chair:** Avishai Henik

Talk 1: The developmental of estimation skills across the life span - Dana Ganor-Stern

Talk 2: Automatization of facts or automatization of procedure? The case of alphabet arithmetic verification - Jasinta Dewi; Catherine Thevenot

Talk 3: The Numerical Approximation System's cognitive factors and calculation fluency - Carlos Mera; Estibaliz Aragon; Manuel Aguilar; Manuel Garcia Sedeño; Gamal Cerda; Carlos Perez Wilson; José I. Navarro

Talk 4: Struggling with single-digit multiplications: testing several hypotheses - Juan Antonio Álvarez-Montesinos; Ismael Rodríguez-Montenegro; Marina Cuadra Jaime; Javier García-Orza

Talk 5: Procedure learning without algorithmic speed up - Jamie Campbell; Yalin Chen; Alicia Orr

Time: 12:00 – 14:00 / **Room:** North school / **Lunch and Poster session 2**

Time: 12:30 – 13:15 / **Room:** South school / **A lunch with the Editors:** Dr John Towse and Dr Barbara Sarnecka to discuss the Journal of Numerical Cognition and preregistered reports. Take your lunch and join the meeting.

Time: 14:00 – 15:30 / **Room:** South school / **Symposium:** The development of symbolic fraction knowledge – Processes and proponents / **Organisers:** Jake McMullen; Percival Matthews; Edward Hubbard

Talk 1: The ratio processing system underpins symbolic fraction understanding: Developmental neuroimaging investigations - Edward M. Hubbard; John V. Binzak; Yunji Park; Priya Kalra; Elizabeth Y. Toomarian

Talk 2: Evaluating Learning Outcomes of a Game-Based Rational Number Training - Kristian Kiili; Antti Koskinen; Korbinian Moeller; Manuel Ninaus

Talk 3: Effects of a number line approach for improving fraction understanding in students with math disabilities - Nancy C. Jordan; Nancy Dyson; Christina Barbieri; Jessica Rodrigues

Talk 4: Neurofunctional plasticity in fraction learning assessed by pre-post intervention fMRI - Silke M. Bieck; Manuel Ninaus; Elise Klein; Kristian Kiili; Johannes Bloechle; Julia Bahnmüller; Thomas Dresler; Korbinian Moeller

Time: 14:00 – 15:30 / **Room:** East school / **Symposium:** **Math Anxiety: from psychophysiology to interventions, through genetic and learning** / **Organisers:** Sara Caviola; Ann Dowker

Talk 1: The psychophysiology of math anxiety: Evidence from skin conductance measurement - Orly Rubinsten; Hili Eidlin Levy; Nachshon Korem

Talk 2: Time pressure and eye-movements: A new physiological measures of math anxiety - Sara Caviola; Dénes Szűcs

Talk 3: Acquisition, development and maintenance of maths anxiety in young children - Dominic Petronzi

Talk 4: Math anxiety and numeracy training in fourth-grade children - Maria Chiara Passolunghi; Sandra Pellizzoni

Talk 5: Development of math anxiety and its longitudinal relationships with arithmetic achievement among primary school children - Riikka Sorvo; Tuire Koponen; Helena Viholainen; Tuija Aro; Eija Räikkönen; Pilvi Peura; Asko Tolvanen; Mikko Aro

Talk 6: Genetic, Environmental and Neural underpinnings of Mathematical Anxiety - Yulia Kovas; Tomasz Bloniewski

Time: 14:00 – 15:30 / **Room:** Room 6 / **Parallel session:** **Numerical processing 3** / **Chair:** Minna Hannula-Sormunen

Talk 1: Analog Magnitude representations are precise contents with epistemic limitations - Justin Halberda

Talk 2: The Time Course of Central Executive Loads Affect Adults' Strategy Execution in Arithmetic with Different Level of Approximate Number System Acuity - Hongxia Li; Mingliang Zhang; Shuang Cui; Jiwei Si

Talk 3: Executive functions and the mapping between nonsymbolic and symbolic mathematics - Ilse Coolen; Julie Castronovo; Kevin Riggs; Myfanwy Bugler

Talk 4: Developmental Trajectory Of Numerical Acuity In Pakistan - Saeeda Khanum; Tayyaba Abid

Talk 5: The Relationship Between Symbolic and Non-Symbolic Number Processing Inside and Outside of the Subitizing Range - Jane Hutchison; Ian Lyons

Time: 15:30 – 16:00 / **Room:** North school / **Coffee/Tea break**

Time: 16:00 – 17:30 / **Room:** South school / **Symposium:** **Foundations for fractions – Non-symbolic ratio processes and relational reasoning** / **Organisers:** Percival Matthews; Edward Hubbard; Jake McMullen

Talk 1: Spontaneous Abstraction of Ratios and Ranks Across Magnitude Dimensions - Cory D. Bonn; Jessica F. Cantlon

Talk 2: Is the Non-Symbolic Ratio Processing System Automatic in Adults? - Nina Attridge; Jayne Pickering; Joanne Eaves; Grace Huyton; Matthew Inglis; Camilla Gilmore; Iro Xenidou-Dervou

Talk 3: Precise Encoding of Relations and Spontaneous Focusing on Multiplicative Relations Support Fraction Magnitude Knowledge - Jake McMullen; Robert Siegler

Talk 4: Reasoning About Fraction Magnitudes and Proportions When Curriculum Supports a Measurement Model of Fraction Understanding: An Australian Sample - Ilyse Resnick; Micah Goldwater; Nora Newcombe

Time: 16:00 – 17:30 / Room: East school / Symposium: **Unpacking the Role of Numerical Ordinal Processing in the Development of Early Math Abilities** / Organisers: Chang Xu; Ian Lyons

Talk 1: Ordinal numerical processing in 4-year-old preschool children: Associations with other early numerical competencies and gender differences - Merel Bakker; Joke Torbeyns; Nore Wijns; Lieven Verschaffel; Bert De Smedt

Talk 2: Kindergarteners reliably mis-classify ordered sequences of non-adjacent numbers - Ian M. Lyons; Jane E. Hutchison; Stephanie Bugden; Celia Goffin; Daniel Ansari

Talk 3: Unpacking the relation between comparison and arithmetic in both adults and children - Delphine Sasanguie; Ian M. Lyons; Bert De Smedt; Bert Reynvoet; Helene Vos

Talk 4: Integration of number relations for children in grades 1-2 - Chang Xu; Jo-Anne LeFevre

Talk 5: The role of numerical and non-numerical ordering abilities in mathematics: Evidence from children with dyscalculia and typically developing children - Kinga Morsanyi; Bianca van Bers; Teresa McCormack; Patrick O'Connor

Time: 16:00 – 17:30 / Room: Room 6 / Parallel session: **Maths achievements 3** / Chair: Miriam Rosenberg-Lee

Talk 1: Old brains and their money. Anatomical substrates and neurocognitive predictors of financial abilities in Mild Cognitive Impairment - Carlo Semenza; Francesca Burgio; Micaela Mitolo; Giorgio Arcara; Annalena Venneri; Francesca Meneghello; Roberta Toffano; Silvia Benavides-Varela

Talk 2: Exploring Diagrams Influence on Students' Mental Models of Mathematical Story Problems - Anna Bartel; Martha Alibali

Talk 3: Predicting mathematical ability before school: A link between ROBO1, parietal cortex volume and numerical reasoning - Michael Skeide; Katharina Wehrmann; Angela Friederici

Talk 4: The Neurochemistry of Mathematical Development - George Zacharopoulos; Francesco Sella; Roi Cohen Kadosh

Talk 5: Understanding number line estimation performance in Down Syndrome and Williams Syndrome - Victoria Simms; Annette Karmiloff-Smith; Jo Van Herwegen

Time: 16:00 – 17:00 / Room: Room 7 / Parallel session: **Philosophy** / Chair: Aaron Sloman

Talk 1: Ordinals vs. Cardinals in \mathbb{N} and Beyond - Aviv Keren

Talk 2: Intuition and Higher Mathematical Cognition - Francesco Beccuti

Talk 3: Evolution - the blind mathematician producing increasingly sophisticated users of mathematical discoveries - Aaron Sloman

Time: 17:45 – 18:45 / Room: South school / **Business meeting** (open to all members)

Poster session 2

Day: Monday 9th / Time: 12:00 – 14:00 / Room: North school

- 1. Same or different? The ERP signatures of uni- and crossmodal integration of number words and Arabic digits** - Sabrina Finke; Ferenc Kemény; Corinna M. Perchtold; Silke M. Göbel; Karin Landerl
- 2. Symbolic number processing and individual differences in adult's arithmetic performance** - Laura Matilla; Rosario Sánchez; Josetxu Orrantia; David Múñez
- 3. The effects of manipulatives in the instructional interventions of mathematics learning disabilities: a systematic review** - Anne Lafay; Helena Patricia Osana
- 4. Improving the use of associativity shortcuts: Interventions using inversion problems** - Joanne Eaves; Nina Attridge; Camilla Gilmore
- 5. Neural Underpinnings of Nonsymbolic Numerical Comparison in Adolescents with Different Math Performance** - Roberto A. Abreu-Mendoza; Yaira Chamorro; Daniel Zarabozo-Hurtado; Esmeralda Matute
- 6. Interaction Effects between BDNF Gene rs6265 Polymorphism and Parent-Involved Education on Primary School Children Basic Mathematical Ability: The Moderating Effect of Gender** - Ming-Liang Zhang; Jiwei Si; Weixing Yang; Hongxia Li; Jiajia Zhang
- 7. The Dissociation between Pupil Dilation and Reaction Time in the Numerical Stroop Task** - Ronen Hershtman; Lisa Beckmann; Avishai Henik
- 8. ERP analysis of hemispheric asymmetry for arithmetic tasks: A comparison of remembering, understanding, and applying-based tasks** - Kanok Panthong; Pattawadee Makmee; Peera Wongupparaj
- 9. Nonsymbolic arithmetic with continuous magnitudes: Evidence from an artificial algebra paradigm** - Anna Wilson; Cam Hooson; Simon Kemp; Randolph Grace
- 10. The Wicked Problem of Research in Mathematical Cognition: Elephants in the Room** - Rene Grimes
- 11. Associations between number processing and single-digit arithmetic: Effects of age, intelligence, operation mastery and SES?** - Isabella Starling Alves; Mariuche Rodrigues de Almeida Gomides; Luciano da Silva Amorim; Vitor Geraldi Haase
- 12. Neural processing of transitive relations predicts math growth in children** - Flora Schwartz; Justine Epinat-Duclos; Jessica Léone; Jérôme Prado
- 13. Influences of basic numerical competencies on fraction processing** - Thomas Dresler; Silke M. Bieck; Katharina Lambert; Korbinian Moeller
- 14. The educational technology and innovation for children with math disability in Thailand: A systematic review** - Jakkarin Chinsuwan; Piyathip Pradujprom; Parinya Ruengtip; Peera Wongupparaj
- 15. Persistent structural differences in developmental dyscalculia: a longitudinal morphometry study** - Ursina McCaskey; Michael von Aster; Ruth O'Gorman Tuura; Karin Kucian
- 16. Semantic networks support approximate computation** - Mengyi Li; Yuxin Tan; Xinlin Zhou
- 17. The common and differential neural developmental trajectories for approximate number system, arithmetic and word phonology** - Yuxin Tan; Mengyi Li; Xinlin Zhou
- 18. Cognitive heterogeneity of math difficulties: a bottom-up classification approach** - Larissa Salvador; Vitor Haase
- 19. The depth of numerical processing in Navon's paradigm** - Inna Barkan; Dana Ganor-Stern; Joseph Tzelgov

- 20. The role of acquired visual cues in magnitude comparisons** - Nirit Fooks Leichter; Nachshon Korem; Batsheva Hadad; Orly Rubinsten
- 21. Who Gains More: Experts or Novices? The Benefits of Interaction under Numerical Uncertainty** - Francesco Sella; Robert Blakey; Dan Bang; Bahador Bahrami; Roi Cohen Kadosh
- 22. Dissociation of neuronal communication accompanying symbolic vs. non-symbolic numerical comparisons** - Nachshon Korem; Naama Levin; Orly rubinsten
- 23. Language influence on mathematics achievement in French-German biliterate ninth graders** - Sophie Martini; Sonja Ugen
- 24. Does Pain Detriment Complex Arithmetic More Than Simple Arithmetic Performance?** - Jayne Pickering; Nina Attridge; Matthew Inglis
- 25. Classroom-based executive function assessments predict kindergarten students' math achievement** - Sammy Ahmed; Barbara S. Dennis; Frederick Morrison
- 26. Mental abacus training promotes number acuity** - Rui Xiao; Jiaxin Cui; Mei Ma; Yan Chen; Li Yuan; Leinian Li; Xinlin Zhou
- 27. How and when children master the numerical content conveyed by verbal numbers and number gesture?** - Line Vossius; Marie-Pascale Noël; Laurence Rousselle
- 28. Tactile Enumeration and Embodied Numerosity Among the Deaf** - Shachar Hochman; Zahira Cohen; Avishai Henik
- 29. Brain mechanisms related to processing of numerals: A magnetoencephalography (MEG) study** - Victoria Simms; Paul Boyce; Yogesh Meena; Hubert Cecotti; Girijesh Prasad
- 30. Effects of Math Anxiety and Math Ability on University Mathematics Engagement** - Richard Daker; Sylvia Gattas; Helen M. Sokolowski; Ian Lyons
- 31. The relation between the processing of space and ordinal information in working memory: a tDCS-EEG study** - Sophie Antoine; James G. Sheffield; Wim Gevers; Roi Cohen Kadosh
- 32. Dimensioned Thinking as Foundation for Teaching Math and Computer Programming and Psychology** - Julia Shaw; Jianhao Chen; Sen Zhang; Jayleen Wangle; Geoffrey O'Shea
- 33. Contributions of inhibitory control to decimal processing and mathematics achievement** - Linsah Coulanges; Sashank Varma; Miriam Rosenberg-Lee
- 34. Spatial Reasoning in Middle School Children: Two-dimensional Representations of Three-dimensional Shapes** - İpek Saralar
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