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Neurodevelopmental Optimal-predictors Risk
Factors And Intervention From A Systems Approach
To Maladjustment In Children

Neurodevelopmental Optimal-predictors Risk Factors
And Intervention From A Systems Approach To
Maladjustment in Children

Date: May 31 – June 3, 2023

Venue: Learning Resource Centre UCY Library
"Stelios Ioannou"
University New Campus / Nicosia

Welcome Message

Dear Participants,

Welcome to the Final Conference of the 4-year Marie Skłodowska-Curie (MSCA) Innovative Training Network (ITN) project on '*Neurodevelopmental Optimal Predictors Risk Factors and Interventions from a Systems Approach for Maladjustment in Children*,' *Neo-PRISM-C*, which focused on training the next generation of European mental health researchers, clinicians, and entrepreneurs. We are delighted to have delegates joining us from 17 countries, including EU countries, the USA, and Canada, as we gather here at the University of Cyprus in Cyprus, an enchanting location blessed with lovely weather. Throughout this remarkable project, we have witnessed the dedication and achievements of 15 doctoral students who have conducted their research under the guidance of our esteemed consortium colleagues. Today, we come together to commemorate the culmination of our collective efforts and celebrate the knowledge and discoveries we have acquired.

Over the past four years, our project has embraced the conceptual shift that the Research Domain Criteria (RDoC) brings to mental health research, particularly emphasizing neurodevelopmental disorders (NDDs). We have acknowledged and addressed the challenges of transforming traditional research training in mental health. By integrating the expertise of various educational, research, and non-academic institutions across the EU and elsewhere in the world, we have strived to promote this transformative perspective. Throughout our journey, we have pursued several primary objectives that are of utmost importance. First, we have aimed to educate Early-Stage Researchers (ESRs) in comprehending the etiological and maintenance mechanisms of childhood mental health problems. This includes understanding how these mechanisms transcend traditional diagnostic categories and elucidating the complexities of comorbidity and heterogeneity. Additionally, we have explored the brain-based dispositions that lead to impairments at the neuropsychological and behavioral levels. Furthermore, we have examined how these principles can be applied to evidence-based prevention and treatment strategies.

Another focal point of our training has been to equip ESRs with a comprehensive understanding of human behavior and functioning, focusing on domains such as learning, emotion, cognition, motivation, and social behavior. In addition, we have delved into the malfunctioning of these systems in neurodevelopmental disorders, including attention deficits, anxiety, autism, learning and language disorders, and their intricate interactions with contextual parameters such as family and school and sociodemographic variables like gender, age, and ethnicity.

We have aspired to uncover the underlying neurobehavioral systems that span multiple neurodevelopmental disorders by fostering a new generation of scholars and clinicians. By developing innovative analytical methods and utilizing cutting-edge experimental technologies, we have endeavored to advance our understanding and improve the lives of children facing mental health challenges. Our goal has been to effectively harness existing expertise and human resources to address societal challenges.

Neo-PRISM-C's crucial aspect has been establishing the link between neurobiological, behavioral, experiential, and environmental components of childhood behavioral and learning problems and appropriate interventions. We have explored interventions encompassing psychological, systemic, and ICT-based approaches, all aimed at targeting fundamental processes, being transdiagnostic in nature, and promoting effectiveness, treatment adherence, and respect for the rights and dignity of children and families.
Lastly, we have strived to disseminate the results of our research to researchers, practitioners, educators, companies, policymakers, and stakeholders. Through this effort, we aim to stimulate the growth of this new interdisciplinary field and ensure that mental health needs across the EU are continuously addressed beyond the conclusion of this project.

As we gather for this Final Conference, we sincerely thank all the participants, our esteemed keynotes, speakers, and contributors for their invaluable insights and unwavering dedication. We are indebted to all of you. This event serves as a testament to the remarkable achievements we have accomplished together. We wish you a memorable and fruitful experience of collaboration, innovation, and mental health research and practice advancement.

Warm regards,

On behalf of the Neo-PRISM-C Consortium

Prof. Timothy C. Papadopoulos, Neo-PRISM-C Project Coordinator
Prof. Georgia Panayiotou, Neo-PRISM-C Vice-Coordinator
Conference Organizers
Nicosia, Cyprus, June 1, 2023

DAY 1: Wednesday, May 31, 2023			Building	Room
13.30	14.00	Arrival & Coffee		
14.00	14.30	Welcome speech	Timothy Papadopoulos (Project Coordinator)	MBA Building	MBA 025
14.30	15.30	Supervisory Board Meeting		MBA Building	MBA 025
15.30	16.00	Coffee Break			
16.00	17.00	ESR workshop on Project Management		MBA Building	131 OED
17.00	18.00	Cultural Activities			
19.30		Dinner			

DAY 2: Thursday, June 1, 2023		
09.00 - 10.00		Registration and Coffee
10.00 – 10.10	Welcome Speech	Timothy Papadopoulos Project Coordinator
10.10 – 10.25		Athena Michaelidou Minister, Education, Sport and Youth, Cyprus
10.25 – 10.40		Nikitas Hatzimihail, Deputy Dean
10.40 – 10.50	Cordial Welcome	Fofi Constantinidou Director of Centre for Applied Neuroscience
10.50 – 11.00		Georgia Panayiotou Project Vice-Coordinator
11.00 - 11.30		Coffee Break
11.30 – 13.00	Main Talk	Timothy Papadopoulos Project Coordinator
13.00 - 14.00		Lunch
14.00 - 15.00	Keynote speaker	**Population Neuroscience of the Growing Brain** Tomas Paus, University of Montreal Summary. In my lecture, I will focus on developmental processes underlying the growth of the human cerebral cortex. I will begin by introducing the concept of population neuroscience as a cross-disciplinary endeavour aimed at identifying factors shaping the human from conception onwards. I will then touch briefly on our previous work on pregnancy and brain growth, followed by our genetic studies that used data obtained in large datasets to reveal molecular architecture underlying the tangential growth of cerebral cortex. Next, I will discuss our findings obtained with "virtual ontogeny" that support a neurodevelopmental model of vulnerability to mental illness whereby prenatal risk factors acting through cell-specific processes lead to deviations from typical brain development during pregnancy. I will conclude with the most recent work from my laboratory on the relationship between fetal growth and the tangential expansion of the human cerebral cortex in times of food scarcity and abundance.
15.00 – 15.15		**Refreshments**
15.15 - 16.15	Oral Presentations Chair: Evgenia Peristera Kouki, UCY	A music intervention for children with reading disorders: preliminary results of a Randomized Control Trial. Maria Ioanna Zavogianni 1, Maja Kelić 2, Ferenc Honbolygó 1, 1 Research Centre for Natural Sciences, Hungary 2 University of Rijeka, Croatia

Summary. This study assesses the efficacy of a newly developed music intervention for improving linguistic and cognitive aspects related to reading disorders. We conducted a Randomized Control Trial (RCT, Clinical Trials ID: NCT05137353) with pre-training, training, and post-training phase. We recruited children with reading disorders, and conducted neuropsychological, behavioral and electrophysiological measurements. The children were randomly assigned to the music or a spelling intervention. The post-training phase matched the pre-training phase. In the pre-training phase, we expect low scores in digit span task, reading fluency, pseudoword reading tasks, and not statistically significant Mismatch Negativity responses during the ERPs. In the post-training phase, we expect positive effects of the music intervention in auditory discrimination of phonemic changes within pseudowords, phonological encoding/decoding, reading fluency. With this study, we will be able to highlight the significance of music interventions as remediation tools for children with reading disorder

Multisensory training elicits different neuroplastic changes in young and older adults

Evangelos Paraskevopoulos [1], Nikolas Chalas [2], Alexandros Karagiorgis [3], Panagiotis Bamidis [3]
[1] University of Cyprus
[2] Institute for Biomagnetism and Biosignalanalysis, University of Muenster, Germany, Germany
[3] Aristotle University of Thessaloniki, Greece

Summary. Experienced readers recognize and process word-like stimuli quicker and more accurately than unknown letter strings. This process becomes automatized as exposure to reading material increases and is evidenced in event-related potential (ERP) paradigms. This study explored the N170 effect in school-age children as an indicator of visual expertise for print. Methods: Fifty-one children aged 9-11 years were recruited. Participants performed a same-different paradigm, in which they were visually presented with pairs of pseudowords and Armenian character strings. Results: Preliminary analysis indicated that differences between poor readers and age-matched controls are reflected in different amplitudes of neural activity in the N170 component. Conclusions: These findings corroborate previous evidence showing that the N170 component is a robust marker for fast, specialized processes in response to visual words compared to low-level visual control stimuli such as strings of symbols.

A multimodal approach in the search for biomarkers for transdiagnostic factors.

Markos Apostolakis, Georgia Panayiotou
University of Cyprus, Cyprus

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		Summary. Objective markers of risk factors and vulnerabilities are commonly used in medicine, but in psychological research they have only recently started being implemented. Efforts to identify indicators of increased risk for the development of complex psychopathological conditions have proven to be futile, mainly due to the lack of a theoretical framework that considers the dimensionality of behavior and the multiplicity of systems involved. This project employs a variety of methods, such as psychophysiology, EEG, self- and other- reports to examine the development of emotion regulation (ER), as a transdiagnostic risk factor, in children between 8-12 years old. Results are expected to confirm previously observed markers of ER such as heart rate variability (HRV), and present novel indices from the domain themes of frustration, fear conditioning and resting state activity. This project follows a multilevel approach to identify candidate biomarkers of ER deficits serving as early signs of later psychopathology.
16.15 - 16.30		Refreshments
16.30 - 17.30	Panel Discussion	**Understanding NDD: Atypicality vs Neurodiversity** Valéria Csépe[1], Timothy Papadopoulos[2] [1]Brain Imaging Centre, ELRN-RCNS, Hungary; [2] University of Cyprus
20.30		Dinner

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DAY 3: Friday, June 2, 2023		
09.00 - 10.00		Welcome / Arrival
10.00 - 11.00	Keynote Speaker	**Comorbidity of Learning Disorders: Associations and Dissociations of Reading, Spelling and Arithmetic Development** Karin Landerl, University of Graz Summary. Neurodevelopmental disorders of reading, spelling, and arithmetic can occur in isolation (i.e. in the context of otherwise typical development), but prevalence studies clearly show that these problems frequently co-occur. Thus, comorbidity of neurodevelopmental disorders is the rule rather than the exception. As learning disorders are typically investigated in isolation, our understanding of the neurocognitive mechanisms underlying their comorbidity is still limited. I will discuss similarities and differences in developmental processes across learning domains. Empirical evidence on domain-specific and domain-general predictors of each skill and their covariance will be presented. Multiple deficit models need to account for associations as well as dissociations of neurodevelopmental disorders.
11.00 - 11.30		Coffee Break
11.30 - 13.00	Symposium	**Child Development: From Neural Substrates to Remediation.** Kathleen Kay Amora [1], Ariane Tretow[2], Cara Verwimp [4], Jurgen Tijms [4], Paavo H. T. Leppänen[1], Valéria Csépe[1], Evgenia Kouki[5], Antriani Tsagkaraki[5], George Spanoudis[5], Timothy C. Papadopoulos[5], Maria Ioanna Zavogianni[1], Georgia Gerike [2,3], Lisa Hintermeier [2], Daria Khanolainen [2], Mareike Kaemmerer [6], Céline Jeitani [6], Magali Lahaye [6], Olivier Luminet [6] [1]Brain Imaging Centre, ELRN-RCNS, Hungary; [2] University of Jyvaskyla, Finland; [3]Niilo Maki Institute, Finland; [4] University of Amsterdam, Netherlands; [5]Univeristy of Cyprus ; [6]Université catholique de Louvain (UCL) Chair: Georgia Gerike, University of Jyväskylä, Finland Summary. This symposium comprises four systematic reviews regarding aspects of typical and atypical child development, from exploring neurophysiological processes to the efficacy of interventions. The first review assimilated literature on neurophysiological and experimental procedures about visual print expertise in reading development. The second review examined the literature on how the Research Domain Criteria (RDoC), a novel multifactorial framework, has been applied in exploring neural and cognitive underpinnings of neurodevelopmental disorders. The third review synthesized and qualitatively assessed evidence on music interventions for children with reading disorders. Finally, the fourth review investigated the efficacy of interventions targeting

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children with chronic medical conditions. The findings of the four studies cover a broad spectrum of topics relating to the multifaceted nature of the neural, cognitive, and emotional development of typically and atypically developing children, thus, highlighting the importance of broader theoretical frameworks in studying child development.

Thematic area 1.: N170 response to words across development: a systematic review

Kathleen Kay Amora[†][*][1,2], Ariane Tretow[†][3], Cara Verwimp[†][4,5], Jurgen Tijms[4,5], Paavo H. T. Leppänen[3], Valéria Csépe[1,2]

[1] Brain Imaging Centre, ELRN-RCNS, Budapest, Hungary; [2]Multilingualism Doctoral School, University of Pannonia, Veszprém, Hungary; [3] University of Jyväskylä, Finland; [4] University of Amsterdam, the Netherlands; [5]Rudolf Berlin Center, The Netherlands
[†]*These authors have contributed equally to this work and share first authorship*

This systematic review investigated the N170 response, an early brain response that indicates print expertise, which is a necessary skill for efficient reading, in individuals with and without reading difficulties. Literature databases were searched for relevant studies published from 1995 to 2020. The review compared results across age groups (pre-literate age, school-aged and adulthood) and reading abilities (typical and poor readers) to capture the development of the N170 response to words. In typical readers, N170 distribution changed from bilateral to left-hemispheric dominance throughout development, whereas in young poor readers, the response remained bilateral. N170w latency varied by age, with adults having an earlier onset but shorter latency than children. The review also discussed theoretical and methodological differences and challenges in the field to guide future research. Overall, this review provided a comprehensive understanding of N170w and its relation to print expertise across different ages and reading abilities.

Thematic area 2: The single deficit, comorbidity or varying degrees of dysfunction? New directions to the study of learning disorders
Evgenia-Peristera Kouki, Antriani Tsagkaraki, George Spanoudis, & Timothy C. Papadopoulos

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Department of Psychology and Center for Applied Neuroscience, University of Cyprus, Nicosia, Cyprus

Objectives: We explore whether new deficit clusters aligned with the Research Domain Criteria (NIMH, 2013), a novel multifactorial framework, better explain known conditions such as ADHD, dyslexia or SLI.

Methods: We review literature from 2015 to 2022 on the RDoC framework and the above conditions. We retrieved 2471 studies on the RDoC Cognitive Systems domain from PubMed, PsycINFO, and Web of Science databases. Studies were processed with Ray.Yan software. After applying inclusion and exclusion criteria, 13 studies were included in the review.

Results: Findings show that RDoC-informed neural and cognitive phenotypes were only partially aligned with DSM-based diagnoses.

Conclusions: The limited number of studies highlights the importance of applying the RDoC model to pediatric populations and speaks for the contribution of this review. RDoC distinguishes the neural and cognitive deficits cutting across neurodevelopmental disorders. Thus, its use can have significant theoretical and clinical implications in diagnosing and treating neurodevelopment disorders.

Thematic area 3: Systematic Review and Qualitative Assessment of Music Intervention Studies for Reading Disorders in Children

Maria Ioanna Zavogianni[1] (corresponding + presenting author) ; Georgia Gerike[2] (corresponding author) ; Lisa Hintermeier[3] (corresponding author) ; Daria Khanolainen[3] (corresponding author) ; Minna Torppa[4] ; Mikko Aro[4] ; Ferenc Honbolygó[1]; Maja Kelić [5] ; Jarmo Hämäläinen[4]

[1]Brain Imaging Centre, Research Centre for Natural Sciences, Budapest, Hungary & Faculty of Modern Philology and Social Sciences, Multilingualism Doctoral School, University of Pannonia, Veszprém, Hungary ; [2]Department of Education, University of Jyväskylä, Jyväskylä, Finland; [3]Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland; [4]Faculty of Education and Psychology, Department of Teacher Education University of Jyväskylä, Finland; [5]Speech and Language Pathology Programme, University of Rijeka, Rijeka Croatia

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Recently, systematic reviews have focused on the improvement of reading skills in typical and struggling readers using music interventions. This systematic review aims at categorising types of music interventions for children with reading disorders in order to examine their efficacy. Another objective is to determine the study quality in music intervention research by assessing various quality indicators (e.g., implementation fidelity, internal validity). Using respective scientific databases, 738 publications were initially retrieved via the applied search strategy. In addition to these articles, 47 publications were found via the handsearching method. The results of the systematic review will provide an overview about the current state of research on music interventions for reading disorders as well as important insights for various stakeholders.

Thematic area 4: Emotional and cognitive processes in psychological interventions for children with chronic diseases – a systematic review

Authors: Mareike Kaemmerer[1], Céline Jeitani[1], Cara Verwimp[2], Magali Lahaye[1], Olivier Luminet[1]
[1]IPSY - UCLouvain, Belgium ; [2]University Of Amsterdam, Netherlands
Corresponding + presenting author: Mareike Kaemmerer, mareike.kaemmerer@uclouvain.be

Chronic physical conditions (CPC) in children can lead to emotional and cognitive difficulties but the latter have not been investigated in reviews on interventions for CPC. This review investigates the role of both processes in the efficacy of psychological interventions for children with CPCs. Articles were selected following the PICOS criteria. Studies had to assess at least one emotional/cognitive process. The review is pre-registered in Prospero (CRD42021233505).Cognitive interventions showed some improvements in cognitive processes, but effects were not homogeneous across studies despite similar methodologies. Coping interventions showed little effect on emotional processes and were not more beneficial than alternative interventions. No study trained or assessed both emotional and cognitive processes. The results show limitations in the literature regarding the processes underlying the improvement/maintenance of psychosomatic health. This review is a first step towards improving the quality of studies and a better understanding of the needs of children with CPCs.

13.00	14.00	Lunch	
14.00	15.00	Poster Session	Investigating spelling errors in Greek using eye-tracking technology Argyro Fella, Christoforos Christoforou, Timothy C. Papadopoulos University of Nicosia, Cyprus Cognitive Predictors of Math Ability in School-Age Children Sofia Gogoglou, Evgenia Kouki, George Spanoudis, Timothy C. Papadopoulos University of Nicosia, Cyprus Cross-Linguistic Predictors of Academic Difficulties and Related Anxiety during School Age Daria Khanolainen, University of Jyvaskyla, Finland Evgenia Kouki, University of Cyprus Minna Torppa, University of Jyväskylä, Finland Timothy C. Papadopoulos, University of Cyprus Internalizing and externalizing psychopathology in children: a psychoneurometric approach Georgia Soursou, Kostas Fanti, University of Nicosia, Cyprus Sublexical Processing in Finnish Typical and Compromised Reading Development Lisa Hintermeier, Mikko Aro University of Jyväskylä, Finland Visual Expertise for Print: an Event-Related Potentials Study Evgenia Kouki, Marios Agathangelou, Evangelos Paraskevopoulos, George Spanoudis, Timothy C. Papadopoulos University of Cyprus, Cyprus Investigating Lexical Semantic Violations in Poor Reading: An Event-Related Potentials Study Anna Panayiotou, Evgenia Kouki, Evangelos Paraskevopoulos, George Spanoudis, Timothy C. Papadopoulos University of Nicosia, Cyprus Methodological approaches when developing Item bank content for Computerized Adaptive Testing (CAT): The instance of a psychometric reading and spelling tool. Leonidas Bourikas, Georgios Sideridis National and Kapodistrian university of Athens, Greece

		Parenting Style and Children's Cognitive and Emotional Development: Preliminary Data Antriani Tsagkaraki, Evgenia Kouki, George Spanoudis, Timothy C. Papadopoulos University of Nicosia, Cyprus Examining perceptual expertise for print in typical and poor reading children: an ERP study Kathleen Kay Amora, Vera Varga, Valéria Csépe Brain Imaging Centre, ELRN-RCNS, Hungary The Child ViReal Support Program: A multimodal intervention program for children with attention deficits and their parents Iouliani Pachiti, Panagiota Dimitropoulou University of Crete, Greece Predicting Reading Outcomes in School Age. Savvina Banti, Evgenia Kouki, George Spanoudis, Timothy C. Papadopoulos University of Cyprus, Cyprus Promoting Speech Intelligibility in children with Speech Sound Disorders Kakia Petinou, Cyprus University of Technology, Cyprus Assessing the psychometric properties of the South Oaks Gambling Screen: A Systematic Review. Revekka Christodoulou, Georgia Panayiotou University of Cyprus Revisiting semantic anomaly and word-neighbour effects in naturalistic sentence reading, the role of adulthood reading fluency and family risk for dyslexia. An overview of preliminary findings. Tretow, A. [1], Gerike, G. [1,2], Loberg, O. [3], Weiss, B. [4], Hautala, J. [2], Hämäläinen, J. [1], & Leppänen, P.H.T. [1] [1] Cognitive Neuroscience of Development and Learning Disabilities Lab, University of Jyväskylä, Jyväskylä, Finland [2] Niilo Mäki Institute, Jyväskylä, Finland [3] Bournemouth University, Bournemouth, UK [4] Brain Imaging Centre, Research Centre for Natural Sciences, Budapest, Hungary
15.00 - 15.15		**Refreshments**
15.15 – 16.45	Symposium	**New trends in neurodevelopmental research: The role of digital technologies.**

Christos Gkoumas[1], Leonidas Bourikas[2,] Iouliani Pachiti[3]
[1] University of Cyprus, Cyprus
[2] National and Kapodistrian university of Athens, Greece
[3] University of Crete, Greece

Chair: Kleanthis Neokleous, CYENS, CoE

Summary. Several cognitive functions, including learning, memory, and attention, as well as complex cognitive abilities like reading, go through significant developmental changes during childhood. Given the significance of these processes for daily life, the literature has given a lot of attention to both their measurement and training. Children nowadays are much more tech-savvy than any other generation. In parallel, digital technologies have become a ubiquitous component, holding great promise for neurodevelopmental research and applications. In this symposium, we will explore how innovative technologies (e.g., Virtual Reality, Artificial Intelligence) can help us better understand the underlying mechanisms of cognitive processes, as well as how they can be used to design more effective interventions for cognitive training and remediation. By bringing together perspectives from different fields, this symposium aims to foster interdisciplinary discussions and collaborations that can pave the way for new and exciting research in the field of developmental cognitive science.

Thematic area 1: **Advantages of Virtual Reality developments for perception and cognition research in children.**

Christos Gkoumas, University of Cyprus

In recent years, advances in Virtual Reality (VR) technology have ushered in new opportunities for researchers and clinicians to assess children's behavior. The increased accessibility of hardware and software has facilitated a paradigm shift from reductionist approaches (e.g., experiments using 2D screens) to more naturalistic methods (e.g., 3D virtual environments). VR serves as a versatile platform for experimentation, simultaneously replicating real-world conditions while affording researchers the necessary control and reproducibility. This is further enhanced by a variety of sensors that measure diverse aspects of behavior, such as eye, head, and body movements, ultimately providing a more comprehensive understanding of how children perceive and

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process information in their surroundings. In this talk, I will present an overview of the advantages VR technology offers in perception and cognition research for children, drawing on findings from both my own research and the broader literature.

Thematic area 2: The use of AI-Methodology for automating scoring of oral responses in the assessment of reading abilities.

Leonidas Bourikas, University of Cyprus

Assessment of reading abilities at early educational stages is critical for identifying reading-related learning difficulties. Regarding Greek reading test batteries, they particularly measure word decoding accuracy either by the presence of an examiner evaluating word articulation accuracy or with an MCQ format in computerized assessments, which is not the most reliable method. The problem-gap is how to measure decoding ability that doesn't require the presence of an examiner. Voice recognition software based on deep learning techniques could be a practical solution. One that can identify the probability of a sound segment containing a phonetic mistake, allowing for automated decoding ability measurement. During the presentation, the architecture of the voice recognition deep learning model and the analysis of voicerelated data will be described. The application can identify phonetic mistakes with overall precision and recall measures over .95. The proposed solution provides a minimum-effort screening tool with automated scoring and reports.

Thematic area 3: A novel approach to attention training for children with attention deficits: The role of virtual reality in the Child ViReal Support Program

Iouliani Pachiti, University of Cyprus

Attention deficits significantly impact children's daily lives, making it vital for them to receive specialized support services. Recent advancements in virtual reality technology allow it to be integrated into intervention programs for children with attention deficits. Therefore, a multimodal intervention program called "Child ViReal Support Program" was designed and implemented for this population. This program consists of parent training and child training, which employs virtual reality technology and cognitive-behavioral techniques to help children enhance their focused and sustained attention and self-regulation skills. A

		randomized controlled trial was conducted in which 16 children aged 9-12 years old with attention deficits and their parents participated. During the presentation, the child training program and the role of virtual reality in this will be discussed along with findings from the randomized controlled trial study and the broader literature on the use of virtual reality in attention training for children with neurodevelopmental disorders.
16.45 - 17.00	Coffee Break	
17.00 - 18.00	Panel Discussion	**Beyond diagnosis and treatment: What about prevention of emotional dysfunction** Georgia Panayiotou, University of Cyprus
20.30	Dinner	

DAY 4: Saturday, June 3, 2023		
09.30 - 10.00	Welcome/Arrival	Marie Curie Alumni Association (MCAA): The Cyprus Chapter and beyond". Georgia Soursou, University of Cyprus
10.00 - 11.00	Keynote Speaker	**From Cognitive Targets to Symptom Reduction: New Directions for Treatment Development** Yair Bar-Haim, Tel Aviv University Abstract. Cognitive Bias Modification (CBM) is a novel class of interventions targeting aberrant cognitive processes considered key in the etiology and maintenance of various psychopathologies. In this presentation, the basic assumptions of CBM will be described and a framework for CBM treatment development will be laid out. An example of a novel CBM treatment for social anxiety disorder will be used to highlight how progress through the different stages of treatment development can be achieved.
11.00 - 11.30	Coffee Break	
11.30 - 13.00	Symposium	**Using Transdiagnostic Approaches to Explore The Interplay Between Genetic and Environmental Influences across Neurodevelopment.** Daria Khanolainen [1], Georgia Gerike1, [2], Georgia Soursou[3], Kostas Fanti[3], Minna Torppa[1], Jarmo Hamalainen[1], [1] University of Jyvaskyla, Finland, [2] Niilo Maki Institute, Finland [3] University of Cyprus **Chair:** Dr. Kostas Fanti, University of Cyprus Summary. Understanding the contribution of genes and environment in neurodevelopment is a salient, yet complex topic. In this symposium, we overview three different approaches to disentangle how gene by environment interactions influence cognitive and psychological development. The first study examines how parental and child reading skills act as proxies for genetic predisposition for dyslexia. This work

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suggests that when parental skills are controlled for, the true effects of the home learning environment on children's reading development can be isolated. The second study employs a discordant monozygotic twins design to examine how environmental factors, such as school support and peer group selection, can be linked to reading difficulties when the home environment is shared. Lastly, the third study applies a mechanistic approach to understand how the interaction between environmental factors, such as positive and negative parenting style, and genetic factors (ie acetylcholine, oxytocin, GABA and HPA axis) interact to influence psychopathological outcomes

Thematic Area 1. **Reading Fluency Growth from Grade 2 to Age 23 and the Effects of Parental and Child Factors**

Daria Khanolainen[1*], Maria Psyridou[2], Kenneth Eklund[2], Tuija Aro[2] and Minna Torppa[1]
[1]Department of Teacher Education, University of Jyväskylä, Finland
[2]Department of Psychology, University of Jyväskylä, Finland

Even though reading can only develop in the presence of targeted instruction, children's trajectories of reading development to a large extent are pre-determined by their genes. In view of this, parental reading can act as a strong confounding factor in research evaluating the role of environmental factors in reading development. Approximately 200 Finnish families participated in the present study. Both parents and children completed reading assessments and different questionnaires. To analyze the data, a latent growth curve model was used. The developmental rate of reading fluency was predicted by rapid automatized naming (RAN), the formal home literacy environment (HLE) (both measured in kindergarten) and reading motivation (measured in elementary school). The adult outcome (fluency at age 23) was predicted by RAN, parental dyslexia, and the formal HLE. Additionally, those who had parents with resolving dyslexia were more likely to follow a resolving trajectory themselves compared to those whose parents had persistent dyslexia.

Thematic Area 2. **ReadTwin: Understanding Environmental Effects on Reading through Characterizing Discordant Monozygotic Twin Pairs**

Georgia Gerike[1,2*], Cherie Jenkins[2], Aino Sorsa[2], Daria Khanolainen[3], Minna Torppa[3], Jarmo Hämäläinen[2]
[1]Niilo Mäki Institute, Jyväskylä, Finland
[2]Department of Psychology, University of Jyväskylä, Finland

[3]Department of Teacher Education, University of Jyväskylä, Finland

The main purpose of the project is to understand cognitive mechanisms related to reading problems that could be caused by the environment. The sample consists of 3 groups of MZ twin pairs - pairs with reading difficulties (concordant poor readers n = 26), pairs with typical reading skills (concordant typical readers n = 56), and pairs where only one of the twins has reading difficulties (discordant pairs n = 34). Looking at within-pair comparisons, diversity in cognitive profiles in discordant twins suggest multiple genetic and environmental pathways exist which can lead to reading difficulties later in life. Within and between twin-pair relationships in non-verbal and verbal reasoning capabilities, reading fluency, rapid serial naming, verbal short-term memory, phonological ability, and speech perception were also explored. Additionally, environmental differences (e.g. the role of school support) are investigated in order to pinpoint key environmental factors that are unique to discordant monozygotic twins with reading difficulties.

Thematic Area 3. **Gene by environment interactions in psychopathology**

Georgia Soursou[1,2*], Kostas A. Fanti[1]
[1]Department of Psychology, University of Cyprus
[2]Center for Applied Neuroscience, University of Cyprus

The aim of this research is to examine the role of gene by environment (GxE) interactions in psychopathology for children aged 8-12 years old by adopting the Research Domain Criteria (RDoC) framework. The sample consisted of 179 parents and 185 children, who completed self-report assessments, performed psychophysiological measurements in the lab, and offered saliva for the extraction of genomic DNA. Bioinformatics analysis stresses out the contribution of neurobiological pathways such as serotonin, acetylcholine, oxytocin, GABA and HPA axis. Structural equation modeling was used to explore the relationship among factors like parenting style, empathy abilities, and child's sensitivity to environment, which may trigger the development of individual characteristics. Future work involves investigation of specific genetic variants associated with environmental stressors as well as the incorporation of the psychophysiological measurements towards the system-level approach that the RDoC

		framework advocates for better contribution to GxE research in psychopathology.
13.00 - 14.00	Lunch	
14.00 - 15.00	Oral Presentations Chair: Georgia Soursou, UCY	**Long-term effects of the home literacy environment on reading development: Familial risk for dyslexia as a moderator.** Minna Torppa[1], Kati Vasalampi[1], Kenneth Eklund[1], Pekka Niemi[2] 1 University of Jyväskylä, Finland, 2 University of Turku, Afghanistan Abstract. This study examines long-term associations (age 2-15) between literacy activities at home and long-term language and literacy development. Of the 198 Finnish participants, 106 have familial risk for dyslexia due to parental dyslexia. The results supported the HLE model in that teaching literacy at home predicted stronger emerging literacy skills, whereas shared book reading predicted vocabulary development and reading motivation. Both emerging literacy and vocabulary predicted reading development. Familial risk for dyslexia was a significant moderator regarding several paths; vocabulary, reading fluency, and shared reading were stronger predictors of reading comprehension among children with familial risk for dyslexia, whereas reading motivation was a stronger predictor of reading comprehension among adolescents with no familial risk. The findings underline the importance of shared reading and suggest a long-standing impact of shared reading on reading development both directly and through oral language development and reading motivation.
		Cognitive control mechanisms during artificial letter-speech sound learning in typical and dyslexic readers. Cara Verwimp[1], Patrick Snellings[1], Reinout Wiers[1], Jurgen Tijms[1], Milene Bonte[2] [1] University of Amsterdam, Netherlands [2]Maastricht University, Netherlands Abstract. It remains unclear how attentional processes impact the formation of the reading network, despite the high co-occurrence of dyslexia and ADHD. We used an artificial letter-speech sound (L-SS) learning paradigm to investigate how attentional processes affect mapping written onto spoken language. We examined three relevant correlates of cognitive control, including goal-directedness, post-error slowing, and feedback-related negativity

		(FRN) ERPs in 71 school-aged children with dyslexia and 59 controls. Most children were able to learn the new script, revealing no significant main effects of instruction or reading group (children with dyslexia vs. controls). However, we found considerable inter-individual variability. To better understand individual differences in learning outcomes, we explored the association between FRN and each child's behavioral outcome. Our findings have important implications for understanding the neurocognitive mechanisms that contribute to early reading difficulties, particularly those related to audiovisual integration, and how these can be addressed in clinical and educational settings.
15.00 - 15.15	Refreshments	
15.15 - 16.00	Panel Discussion	**Intervention in the context of the multidimensionality of developmental disabilities: insights & challenges** Marios Avraamides[1], Juha-Matti Latvala[2], Jurgen Tijms [3] [1] University of Cyprus, [2] Niilo Mäki Institute [3] University of Amsterdam, Netherlands
16.00 - 17.00	Closure/Poster Award	

NEO PRISM·C
Neurodevelopmental Optimal-predictors Risk Factors And Intervention From A Systems Approach To Maladjustment In Children

Neurodevelopmental Optimal-predictors Risk Factors And Intervention From A Systems Approach To Maladjustment in Children

[FINAL CONFERENCE]

31 May - 03 June 2023

University of Cyprus, Nicosia, Cyprus

NEO PRISM·C

The Neo-PRISM-C Consortium and its co-ordinating institution, the Center for Applied Neuroscience, are delighted to open a call for abstracts to be considered for the 2023 Final Neo-PRISM-C Conference. The conference is organized in collaboration with the Department of Psychology, University of Cyprus.
The conference's theme is **Neurodevelopmental Disorders: New Directions.**

It aligns with the aim of the Neo-PRISM-C MSC ITN Horizon 2020 project to study neurodevelopmental disorders (NDD), emerging in the early years of life and resulting in long-term disability, compromising the quality of life of millions of Europeans. The conference's main objective is to highlight progress in central areas related to maladjustment in children from the scope of optimal predictors of neurodevelopment and risk factors within a systems approach. Furthermore, the presentations focus on improving contemporary practice in education and strengthening research's impact on policy/services and society.

● The conference will be held in person on:
Wednesday, May 31 - Saturday June 3, 2023,
at the University of Cyprus, in Nicosia, Cyprus.

Conference Website

www.neoprismc.org

We encourage submissions from researchers at all career stages.
There is no fee to submit an abstract. For participants outside the consortium, the conference standard registration fee will be 100€ and €70 for students to subsidize the cost of the event (coffee breaks and lunches throughout the meeting).

● **Venue: University of Cyprus**

Abstract Submissions:

Abstracts (up to 150 words): The outline of your paper should cover key questions, theoretical issues, methodology, and (preliminary) findings. In addition, please provide the following information: name, affiliation, and e-mail address, and indicate if you are an early-career researcher (up to 5 years after Ph.D.).

Three submission types:

Oral presentation: The number of oral presentations of 15 minutes (plus 5 minutes of discussion) is limited; the proposals undergo a strict reviewing process. The presentations are expected to showcase new research ideas, complete with planned experimental design(s) and analysis approach(es). Data are required, or pilot data for proof of concept.

Poster: A poster showcases the latest findings based on quantitative or qualitative data on neurodevelopmental disorders collected and analyzed. We welcome and encourage preliminary work.

Symposium includes a set of talks providing an in-depth perspective on a particular research area/topic within the scope of the conference. The sessions can comprise three talks and a comprehensive summary by a discussant. All symposia must have a chair responsible for the symposium proposal, including an overview of the main objective(s) and individual abstracts of the invited papers. The duration of each symposium will be 90 minutes.

Panel Discussions

The **panels** are organized by the project's principal investigators. Panellists of 3-4 experts on the topic chosen will discuss recent findings on neurodevelopmental disorders and their intervention, emphasizing proposals for policy formulation at international, European or local levels. The panel discussion will reflect on the day's presentations, and questions asked by attendees in advance and highlight the experts' current approach to research and their outcomes.

Advancing Interdisciplinary Science

We welcome submissions from all domains studying neurodevelopmental disorders, including psychology, neuroscience, cognitive and computer science, affective science, education, psychometrics and more.

Submission Deadlines

Abstracts must be submitted by **March 20, 2023**, at 12:00 p.m. EST to be considered for inclusion in the program. You will be informed of the peer review outcome by **April 10, 2023**.

Please submit your abstract to: www.easyacademia.org/neoprismc

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Call for papers

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