# CALL FOR APPLICATIONS



## Neo-PRISM-C European Training Network (ETN)

## NEurodevelopmental Optimal-Predictors, Risk factors, and Intervention from a Systems approach to Maladjustment in Children

# Vacancies for PhD students at University of Jyväskylä (JYU) and Niilo Mäki Institute (NMI) in Jyväskylä, Finland

**Join our team! Learn about multidisciplinary approaches to developmental learning disorders!**

**Host supervisors: Prof. Paavo Leppänen, Prof. Mikko Aro, Assoc. Prof. Minna Torppa, Dr. Juha-Matti Latvala**

**We offer**
- **Exciting research environment with a long tradition of research on developmental learning disorders**
- **A PhD-title after 4 years of full-time study (PhD thesis with 3 research articles and the required doctoral courses)**
- **A thorough scientific education and the possibility to become a world-class researcher with versatile methodological skills**
- **Membership of world-renowned labs and motivated interdisciplinary research teams**
- **A competitive salary with additional resources for research costs as well as international conferences and collaboration**

**Proposed ESR projects at JYU and NMI are part of the European Training Network Neo-PRISM-C project and investigate hot topics in development and learning, learning disorders, and brain development.**

**Project 1 (ESR 2): Familial risk mechanisms in learning difficulties**
Key concepts: reading difficulties, math difficulties, familial risk, longitudinal study, home environment, cognitive development

**Project 2 (ESR 7): Persistence of learning difficulties in reading and digital assessment of reading difficulties**
Key concepts: reading difficulties, longitudinal study, cognitive development, brain responses (MEG)

**Project 3 (ESR 8): Characterising longitudinal neurocognitive profiles of children with reading difficulties, known risk alleles (genetic profiles) and infant/child brain response patterns associated with early adulthood reading difficulty related brain data profile (measured with MEG and MRI)**
Key concepts: dyslexia, brain mechanisms, MEG/EEG, brain connectivity, eye-tracking, prediction

**Project 4 (ESR 14): Development of reading fluency: The relevance of sublexical processing in reading development**
Key concepts: reading development, reading fluency, dyslexia, experimental research, intervention, eye movements

# More information about the positions and projects below
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# Early Stage Researcher (ESR) positions

- At the University of Jyväskylä and Niilo Mäki Institute there are altogether **4 positions for Early Stage Researchers** (ESRs; doctoral students) in a Neo-Prism-C project aiming to study neurodevelopmental disorders (NDD).
- _Neo-PRISM-C_ ETN has 15 positions for ESRs in various European institutions, and its goal is three-fold. First, it seeks to train Early Stage Researchers (ESRs) in applying the Research Domain Criteria, a novel framework for understanding psychopathology and the study of the mechanisms and treatments of NDD. Second, it aims to train ESRs from multiple disciplines (psychology, educational sciences, neuroscience, data science) in state-of-the-art research and transferable skills for innovating the study of NDD in the context of a systems-based, trans-diagnostic theoretical frame. Finally, this ETN will also support training in designing evidence-based, individualized treatments of learning, behavioral, and social maladjustment, bridging across diagnostic categories. Towards these goals, we have assembled a trans-sectoral European network with expertise in cognitive, social, educational, clinical, and emotion research to provide training ESRs.

- Applicants from <u>all relevant academic disciplines</u> are encouraged to apply, including psychology, educational sciences, neuroscience, data science, and related disciplines. The selected doctoral students for these 4 positions will be enrolled in the doctoral school of the Faculty of Education and Psychology, University of Jyväskylä, Finland

- The multidisciplinary **_Neo-PRISM-C_** project is funded by the Horizon 2020 Marie Skłodowska-Curie action of the European Union. It is part of the Innovative Training Network (ITN) actions (http://www.neoprismc.org/).

**Project 1 (ESR 2): Familial risk mechanisms in learning difficulties**
**Host Institution:** University of Jyväskylä, Finland

**Supervisors:** Minna Torppa (University of Jyväskylä), Mikko Aro (University of Jyväskylä), Timothy Papadopoulos (University of Cyprus)
**Key concepts:** reading difficulties, math difficulties, familial risk, longitudinal study, home environment, cognitive development

**Expected outcomes**
(1) To gain developmental understanding of the co-morbidity of reading and math difficulties from early childhood to adolescence.
(2) To gain knowledge on the impact of familial risk in reading and math difficulties and their co-morbidity in the course of child's math and reading development. Better understanding is achieved on the mechanisms explaining why reading and math difficulties run in families and on the other significant risk and protective factors in children and in their environment. (3) To gain significant skills in child development and statistical methods, including longitudinal data analysis, structural equation modeling and twin analysis enabling the ESR to excel in several future scientific areas.

**Specific qualifications expected**
ESR2 will investigate the risk and protective factors in families contributing to reading and math difficulties and their co-morbidity. The project includes analysis of already available large-scale longitudinal data and participation in quantitative data collection that include both child and adult participants. Thus, experience in quantitative methods and statistical softwares as well as participation in research projects will be considered as an advantage.

**Project 2 (ESR 7): Persistence of learning difficulties in reading and digital assessment of reading difficulties**
**Project Title:** Persistence of learning difficulties in reading and digital assessment of reading difficulties
**Host Institution:** Niilo Mäki Institute, Jyväskylä, Finland
**Supervisors:** Juha-Matti Latvala (Niilo Mäki Institute), Paavo Leppänen (Academic supervision, University of Jyväskylä), Ferenc Honbolygo (Research Center for Natural Sciences, Hungarian Academy of Sciences)
**Key concepts:** reading difficulties, longitudinal study, cognitive development, brain responses (MEG)

**Expected outcomes**
This ESR project will investigate the differences in MEG-measured brain activation of adults who have had problems in learning to read in their childhood at school-age employing advanced brain data analysis techniques (e.g., ICA, source-based connectivity).
1) The project will produce new information about the continuity of learning disabilities in reading and how disabilities are manifested in differences in the brain in the reading network (visual word form area/fusiform, temporal language areas, and left inferior frontal brain areas) and frontoparietal attention network as a function of the persistence of reading disabilities.
2) The project will also bring new knowledge on whether persistent reading problems show more atypical brain activation pattern of the reading network compared to the compensated readers who have overcome their school-age difficulties (showing less severe atypicalities, e.g., differences in brain activation laterality).
3) Further, the project will also provide new information about Internet/ digital reading skills and their cognitive and neural level predictors.

**Specific qualifications expected**
ESR will examine (1) brain activation and cognitive performance profiles in adults, who have had learning disabilities in reading in their childhood and (2) differences in brain activation

between adults whose reading disability has resolved and those whose school-age reading disability is still persistent. Thirdly (3), ESR will investigate to what extent linear text reading difficulties and their school-age cognitive risk factors as well brain activation patterns also predict difficulties in digital e-reading.

Thus the ESR is expected to have knowledge of human neurophysiology and psychology of learning difficulties and prior experience with EEG and/or MEG, including signal processing skills, is considered as an advantage.

**Project 3 (ESR 8): Characterising longitudinal neurocognitive profiles of children with reading difficulties, known risk alleles (genetic profiles) and infant/child brain response patterns associated with early adulthood reading difficulty related brain data profile (measured with MEG and MRI)**
**Host Institution:** University of Jyväskylä, Finland
**Supervisors:** Paavo Leppänen (University of Jyväskylä;
https://www.jyu.fi/edupsy/fi/laitokset/psykologia/en/staff/leppanen-paavo), Valéria Csépe
(Research Center for Natural Sciences, Hungarian Academy of Sciences)
**Key concepts:** dyslexia, brain mechanisms, MEG/EEG, brain connectivity, eye-tracking, prediction

**Expected results**
This ESR project utilizes already collected and new data gathered in this project in collaboration with a unique Jyväskylä Longitudinal Study of Dyslexia, in which brain and behavioral data exists from birth to young adulthood. The phase included MEG recordings and allows
1) to produce new knowledge of the neural and genetic basis of reading and digital reading.
2) to help to understand how earlier infant-, pre- and school-age brain activation patterns predicts adulthood brain processes related linear text and Internet reading, such as connectivity between brain areas involved in the reading network (fusiform, VWFA, temporal language areas and inferior frontal areas) or those involved in the frontoparietal attention network.
3) to produce integrative knowledge utilizing multiple level methodologies, including natural sentence and web-page reading, eye-tracker guided fixation-related MEG activation combined with structural MRI imaging, and machine learning analysis techniques. The expected output can also be used for developing instructional material and for teaching practices.

**Specific qualifications expected**
ESR will examine (1) pre-school and school-age cognitive processes and neural signatures predicting later early adulthood brain processes underlying linear and Internet
reading skills, (2) the role of genetic profiles in early adulthood reading difficulty and (3) how the neural signatures differ between adults with persisting reading problems and those who have overcome their reading disability.

Thus the ESR is expected to have knowledge of human neurophysiology and psychology of learning difficulties and prior experience with EEG and/or MEG, including signal processing skills, is considered as an advantage.

**Project 4 (ESR 14): Development of reading fluency: The relevance of sublexical processing in reading development**
**Host Institution:** University of Jyväskylä, Finland
**Supervisors:** Mikko Aro (University of Jyväskylä), Minna Torppa (University of Jyväskylä), George Spanoudis (University of Cyprus)

ESR14 will investigate the role of syllabic and morphological processing in reading development, utilizing eye movement and behavioral paradigms, and examine the effects of training on sublexical processing on reading fluency

**Expected outcomes**
    (1) To gain new knowledge on the role of syllabic and morphological processing in reading at various stages of typical and compromised reading development .
    (2) To gain knowledge on the effects of training sublexical (syllabic and morphological) processing skills in children having dysfluent reading skills.
    (3) To gain expert knowledge in reading development and its problems, statistics, as well as integrative research methodology enabling the ESR to excel in future scientific work.

**Specific qualifications expected**
ESR will focus on (1) typical and atypical development of reading skills, (2) the effects of training on fluency development in children with problems in reading fluency, (3) integrating eye movement and behavioral data in experimental paradigms.

Thus prior experience with reading research and/or psycholinguistics as well as eye movement research will be considered an advantage.


# Hosting Institutions

**University of Jyväskylä**

University of Jyväskylä is a dynamic multidisciplinary research university with a naturally beautiful campus in the Jyväskylä city centre. It is a modern, open and collaborative community of 2,500 experts and 15,000 students. It was here in 1863, when Finnish-language teacher education began.

The Faculty of Education and Psychology comprises three departments – Education, Teacher Education and Psychology – and the Teacher Training School, which provides basic education and general upper secondary education (https://www.jyu.fi/edupsy/en). The

faculty has 30 professorships. The number of staff is about 350. The Faculty of Education and Psychology undertakes significant, internationally recognised research. In the QS World University Rankings 2019 the Research in Education was ranked globally at the position 101–150, and in Psychology at the position 251-300. The researchers of the faculty are sought-after partners in collaborative research and funding applications. The faculty also provides high-quality education in its various disciplines. The Department of Psychology educates about a third of the psychology graduates in Finland. Within educational sciences the faculty is one of Finland's largest units in teacher education, and in special teacher education it is the largest.

The faculty of Education and Psychology has an especially long tradition in multidisciplinary research of learning and neurodevelopmental disorders. The research approaches include longitudinal and intervention designs, brain research and eye-tracking methodologies. The faculty hosts also the Methodology Centre for Human Sciences, Centre for Learning and Teaching, ForLearning network for research on learning disabilities, and Jyväskylä Centre for Interdisciplinary Brain Research. Below are useful links:

Come and work with us: https://www.jyu.fi/en/workwithus/
International Staff Guide: https://www.jyu.fi/en/workwithus/international-staff-guide

**Niilo Mäki Institute**
Niilo Mäki Institute (Niilo Mäki Foundation, NMI) is a multidisciplinary center for research and development work for learning difficulties. In addition to research activities, the focus is to produce evidence-based material, information and methods to support children and youth, who have problems with their learning. Also, NMI offers in-service training for teachers and special education teachers, psychologists and therapists, and upkeeps (in collaboration with the town of Jyväskylä) Child Assessment clinic. At the moment NMI has 17 research and development projects and employs ca 50 employees. NMI is a non-profit organisation, and it does not render doctoral degrees. The ESR will be linked to Doctoral School of the Faculty of Education and Psychology at University of Jyväskylä.

**Practical details, salary and benefits**
- **Taxable monthly gross salary paid to the employee is about 3.500,00 € /month (including taxable mobility allowance) for 36 months.** In Finland, all employees pay the Finnish progressive tax (determined by the tax office), and in addition, pension fee 6,75% (2019) and employee unemployment insurance fee 1,50% (2019) from the taxable monthly gross salary. Qualified applicants based on family status may receive an additional taxable Family Allowance of €415 per month.
- For the ESR, while employed, the following insurances will be covered by JYU: Sickness insurance, Group life insurance, Unemployment insurance, and Accident Insurance.
- Tuition free courses and supervision for doctoral studies at the University of Jyväskylä
- **Starting date:** preferably in September 2019

**How to apply:**
- For all 4 positions, submit **latest by April 26th 2019:**
  - Letter of motivation (research interests, research career goals, skills, experience, reasons for applying to the program and the specific host organization)

- A full updated CV (including among other information, personal details with complete contact data, work, and education history, etc.)
- Certified copies of relevant degrees and English Language proof of proficiency
- The names and e-mail addresses of two referees
- For JYU positions (ESRs 2, 8, 14) use the following link and submit your application material:
  http://rekry.saima.fi/certiahome/open_job_view.html?did=5600&lang=en&id=00007108&jc=12
- Concerning the NMI position (Project 2, ESR7), the candidates are asked to submit the required application documents (see above) in a single pdf-file via email with "neo-prism-c application" written in the e-mail subject field, to the executive director of Niilo Mäki Institute, Dr. Juha-Matti Latvala at juha-matti.latvala@nmi.fi

## Eligibility criteria

Successful applicants should:
(a) Must **not** have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation (Finland) **for more than 12 months** in the 3 years immediately prior to the contract commencement date; and
(b) For entry into either Ph.D. program, a Masters degree from an accredited University is required.
Women and men from all countries are encouraged to apply.

## Other Qualifications/Competences

1. A Master's degree in psychology, educational sciences, cognitive neuroscience, cognitive sciences, data science, or related disciplines.
2. Excellent written and spoken English skills (applicants are required to provide relevant proof).
3. A keen interest in research on learning difficulties /developmental learning disorders
4. An inquisitive and creative mind, good problem solving skills
5. Very good English proficiency, willingness to learn Finnish is a benefit
6. Ability to work with international research teams and children from special and vulnerable populations
7. Sufficient specialist knowledge in research methods and techniques.
8. Strong organizational and planning skills and ability to take initiatives.
9. Proven knowledge of the themes examined in the ESR projects will be considered as an advantage. Knowledge can be documented e.g. by master's studies, thesis work, publications, teaching and supervision on the topics, teamwork, or management experience.
10. Demonstrated experience with working in research projects will be considered an advantage.
11. Knowledge of at least one more European Language represented in the consortium (e.g., French, Finnish, Hungarian) will be considered as an advantage.
12. Proficiency in statistical softwares (e.g. SPSS, R, Mplus) will be considered as an advantage.
13. For ESRs 7 and 8, knowledge and prior involvement in experiments using brain imaging methods (e.g., EEG, MRI, fMRI, fNIRS, MEG), data collection, analysis, and interpretation will be considered as an advantage.
14. For ESR 14, knowledge and prior involvement in experiments using psychophysiological and neurophysiological experimental techniques (e.g., eye-tracking, startle eyeblink; nerve conduction; habituation; electrodermal activity (GSR); electromyography, heart rate variability) will also be considered as an advantage.

**Additional information**

Overall, *Neo-PRISM-C* will offer the ESRs:
- Project-specific research in neurodevelopmental disorders
- Full-time employment for 4 years with a competitive salary and additional resources to take part in international conferences and collaborations
- A PhD-title after 4 years of research (requirement: PhD thesis with 3 research articles and the required doctoral courses)
- Secondments to partner organizations
- Participation in workshops and courses /training on scientific and entrepreneurial skills, as well as excellent supervision
- Competitive salaries and additional resources to take part in international conferences and collaborations
- Membership of world-renowned labs, as part of a motivated interdisciplinary team

**Post Financial Terms**

The *Neo-PRISM-C* consortium comprises eight teams from several European countries and N. America partners and has a total budget of €4 million. The post for the ESR is **a full-time** and fixed term for three years with a possibility for additional funding year from JYU (with a trial period of 6 months), with an expected start date September 1, 2019.

**Living in Finland and Jyväskylä**

Finland is a Nordic welfare society characterised by free education and low-cost health and social services. Finland has four distinct seasons: winters can be cold and snowy, whereas the summer temperatures can rise above 30℃/86℉. Finland ranks close to the top in international comparisons of educational outcomes, such as in OECD PISA assessments in reading, math, and science. The Quality of Life Index 2019 ranks Finland globally as 3rd after Denmark and Switzerland. Finland tops the global Good country index, which seeks to measure "what each country on earth contributes to the good of humanity". For non-Finnish speakers it is good to know that in English Proficiency Index 2019, the proficiency of English language in Finland is rated Very High and ranked clearly above the European average (6th out of 32 countries). (We would also probably rank high in liking international comparisons.) For more things you should and shouldn't know about Finland, please take a look at https://finland.fi/

The city of Jyväskylä has more than 140 000 inhabitants, being the 7th largest city in Finland. It is located in Central Finland, around 270 kilometers north of Helsinki. Jyväskylä is a vibrant and youthful city characterised by a large number of students. It is surrounded by Finnish nature with large forest areas and thousands of lakes, thus offering wonderful opportunities for outdoor life. Jyväskylä is also well-known for it's versatile sports facilities, no matter whether you are interested in ski jumping, sailing or something in between.

# Neo-PRISM-C beneficiaries and partners

BENEFICIARIES



PARTNERS