Curriculum vitae

Lauri Nummenmaa

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1. Personal information

Name	Lauri Tapio Nummenmaa
Born	April 27th, 1977
Address	Turku PET Centre c/o Turku University Hospital FI-20520 Turku, Finland
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Education

- **PhD (Psychology)** 2006 from University of Turku
- **Licensed psychologist** (independent practice) 2001
- **MA (Psychology)** 2001 from University of Turku, minors in mathematics, statistics and education

Theses

- **Doctoral thesis**: *Orienting of social attention*. Grade: Laudatur
- **Master's thesis**: *The role of statistics anxiety and self-efficacy in learning introductory statistics*. Grade: Magna cum laude approbatur

Language skills

- **Finnish:** Native speaker
- **Swedish**: Fluent
- **English**: Fluent
- **German**: Average

Current positions

- **Professor in modelling and medical image analysis** at Turku PET Centre and Department of Psychology, University of Turku, Oct 2019 – current
- **Chief Executive Officer**, Nummenmaa Oy, Oct 2022 – current
- **Member of advisory board, HRS Advisors Oy,** Jan 2023 - current
- **Adjunct professor** at Department of Biomedical Engineering and Computational Science, Aalto University School of Science, June 2010 - present
- **Adjunct professor** at University of Turku, Department of Behavioural Sciences and Philosophy, Nov 2009 – present

2. Professional experience

Past occupations

- **Associate professor in modelling and medical image processing** at Turku PET Centre and Department of Psychology, University of Turku, Sept 2016 – Sept 2019.
- **Assistant professor** (part time) at the Department of Neuroscience and Biomedical Engineering at Aalto University. Nov 2012 – Aug 2016.
- **Professor** (part time) at University of Turku, Department of Psychology, June 2014 – June 2016
- **Academy of Finland Fellow** (part time), Turku PET Centre, Sept 2011 – Aug 2016.
- **Senior Research Scientist** at Brain Research Unit, Low Temperature Laboratory, Aalto University School of Science, Oct 2009 –2012.

- **Research Fellow** (Academy of Finland grant #121031) at Department of Psychology, University of Tampere, Finland, Jan. 2008 – Sept. 2009.
- **Visiting Research Fellow** at Medical Research Council Cognition and Brain Sciences Unit, Cambridge, UK, Jan. 2007 – Dec. 2007
- **Junior Lecturer**, University of Turku, Department of Psychology, Jan. 2002-Dec. 2006.
- **Psychologist**, University of Turku, Centre for Learning Research, May 2001 – Dec. 2001.
- **Intern (psychologist)**, University of Turku, Centre for Learning Research, Jan. 2001 – Apr. 2001.

Working abroad

- **Visiting Research Fellow** (Academy of Finland grant #119088) at Medical Research Council Cognition and Brain Sciences Unit, Cambridge, UK, Jan. 2007 – Dec. 2008

Honors, prizes and awards

- Academy of Finland Award (2016)
- Alfred Kordelin prize for scientific excellence (2012)
- Turun yliopistoseura (2007). Award for an outstanding doctoral disseration

Memberships in scientific societies

- Academia Europaea – The Academy of Europe. Member, Nov 2021-present
- Finnish Academy of Science and Letters, Member, Apr 2022-present

Grants, principal investigator

- **Total grant money obtained:** 4,773,449€
- **2022**: Signe och Ane Gyllenberg's stiftelse – research grant *Multisystem imaging of the whole-body emotion circuit with total-body positron emission tomography* (17,500€).
- **2022**: Sigrid Juselius Foundation – research grant *Neuromolecular and metabolic mechanisms of anorexia nervosa: A longitudinal multi-tissue PET-MRI study* (55,000€)
- **2020:** Academy of Finland - project grant (#332225) *Social and environmental determinants of human brain function: A molecular and structural register-based neuroinformatics study* (480,000€).
- **2020:** Signe and Ane Gyllenber Stiftelse -research grant *Neuromolecular and metabolic mechanisms of anorexia nervosa* (15,000€)
- **2018** University of Turku - research grant *Register cohort on brain structure, function, and somatic and psychological well being* (100,714€)
- **2017**: Sigrid Juselius Foundation – research grant *Effects of somatic, psychological and socioeconomic well being on brain health* (165,000€).
- **2016**: Academy of Finland - key project grant (#304385) for project *Neuromolecular risk factors for obesity* (295,508€).
- **2016**: Academy of Finland - research grant (#294897) *Molecular And Functional Neural Mechanisms of Social Bonding in Humans* (480,000€).
- **2014:** Academy of Finland - extension to research grant (#283320) *Food addiction in the brain: Molecular and functional neural mechanisms of overeating and obesity* (227,122€).
- **2012:** Academy of Finland MIND research program grant (#265917) *Face to Face: Molecular and Functional Neural Mechanisms of Social Bonding and Interaction* (867,966€).
- **2012:** European Research Council Starting Grant (ERC-STG #313000) *Fitting the World to Minds: Brain Basis of Sharing and Transmitting Representations of the Social World* (1,280,480€)
- **2011:** Academy of Finland Research grant (#256147) *Food addiction in the brain: Molecular and functional neural mechanisms of overeating and obesity* (248,624€).
- **2011** Academy of Finland Senior Fellowship grant (#251125) *Food addiction in the brain: Molecular and functional neural mechanisms of overeating and obesity* (391,475€).
- **2007:** Academy of Finland Junior Fellowship Grant (#121031) *Neural mechanisms of social attention* (189,000€).
- **2007:** Alfred Kordelin Foundation's post-doctoral research grant (9,000€).

- **2006:** Academy of Finland Research grant (#119088) for working abroad (37,860€).
- **2006:** Alfred Kordelin's Post-doctoral research grant (16,000€).
- **2006:** Wäinö Edward Miettinen research grant (2200€).
- **2006:** Turku University Foundation travel grant (1,000€).
- **2005:** Emil Aaltonen Foundation Research grant (4,000€).

Grants, co-investigator

- Spanish Ministry of Science and Education (2009), Research Grant (PSI2009-07245) *Cognitive Mechanisms in Emotional Facial Expression Identification* (64,900€). PI: Manuel G. Calvo.
- Sigrid Juselius's foundation (2010) *Brain-Gut-Adipose Interaction in Obesity Studied using Molecular Imaging and System Approach* (70,000€). PI: Pirjo Nuutila.
- Sigrid Juselius's foundation (2011) *Brain-Gut-Adipose Interaction in Obesity Studied using Molecular Imaging and System Approach II* (66,500€). PI: Pirjo Nuutila.

3. Editorial experience

Editorships

- Philosophical Transactions of the Royal Society of London Series B – Biological Sciences (2021 - present)
- Cognition & Emotion (Associate editor; 2010 – present)
- Cognitive, Affective & Behavioral Neuroscience (Consulting editor; 2015 – present)
- Social Cognitive and Affective Neuroscience (Consulting Editor, 2018 – present)
- Affective Science (Member of editorial board, 2021 – present)

Ad hoc reviewing –

- **Over 50 different journals** including Biological Psychiatry, Cerebral Cortex, Current Biology, PNAS, Proceedings B, and Psychological Review

Reviewing - grants

- National Science Foundation (2016)
- Swiss National Science Foundation (2016)
- The French National Research Agency (2014-2016)
- FAS project grants (2012)
- Deutsche Forschungsgemeinschaft (2012)
- Vienna Science and Technology Fund (2011)
- Wellcome Trust, UK (2010)

Reviewing – professorships

- Catholic University of Leuven, Associate Professorships (2010)

Reviewing – PhD theses

- Helen Uusberg (2018), University of Tartu
- Tiziana Quarto (2018), University of Helsinki
- Sinead Chen (2017), University College London
- Ping Yiang (2017), University of Helsinki.
- Ruth A. Savage (2015), University of Queensland
- Michael Laakasuo (2015), University of Helsinki
- Tapani Riekki (2014), University of Helsinki
- Antti Rantanen (2013), University of Oulu
- Hamdi Eryilmaz (2012), University of Geneve

Consulting

- HRS Advisors Oy (member of advisory board)
- Samsung Nordic (advertising and emotions)
- Fazer Foods (neurobiology of appetite)
- Palgrave Macmillan (book manuscript reviewing)
- Routledge / Psychology Press (book manuscript reviewing)
- Tammi Publishers (book manuscript reviewing)

- Taylor & Francis (book manuscript reviewing)
- Psykologitiimi päämäärä (psychometrics consultant)

Administrative experience

- The European Society for Cognitive and Affective Neuroscience (2024): Member of the scientific committee
- Turku PET Symposium (2017; 2022). Member of the organizing committee
- International Conference for Cognitive Neuroscience Meeting (2020): Member of the scientific committee
- Consortium of European Research on Emotion Meeting (2018): Member of the academic committee
- Attention & Performance meeting XXVI (2015): Member of the organizing committee
- Finnish Psychological Association: Member of the board (2002-present)
- National Congress of Psychology (2004) member and secretary of the organizing committee

4. Teaching experience

Graduate and undergraduate courses taught

- Turku PET Centre Neuroimaging course (20 h / course), years 2022 →
- Experimental Methods for Biological Sciences I & II (20 h / course), years 2012-2015
- Advanced multivariate statistics (16 h / course), year 2004
- Psychometrics (26 h / course), years 2002-2006
- Experimental psychology (20 h / course), year 2002
- Developmental psychology (20 h / course), years 2002-2003
- Statistics for the behavioural sciences (30 h / course), years 2002-2004
- Interviewing and observation research (20 h / course), years 2002-2004
- Multivariate statistics (30 h / course), years 2003-2006

Supervised PhD Theses

- Tatu Kantonen (2022). *Brain opioid and endocannabinoid systems as risk factors for obesity. Positron emission tomography studies of μ-opioid and CB1 receptors with glucose uptake analysis.*
- Sandra Manninen (2019). *Endogenous opioid system and human sociability.*
- Tomi Karjalainen (2019): *Opioidergic regulation of human affiliative behavior: Evidence from positron emission tomography studies.*
- Juulia Suvilehto: (2018): *Maintaining social bonds via interpersonal touching: A cross-cultural study.*
- Dmitry Smirnov (2018). *Brain basis of sharing and transmitting representations of social world.*
- Heini Saarimäki (2018). *Decoding emotions from brain activity and connectivity patterns.*
- Henry Karlsson (2016). *Neuroreceptor availability and cerebral atrophy in human obesity.*
- Jetro Tuulari (2015): *Effects of obesity and weight loss following bariatric surgery on brain function, structural integrity and metabolism.*

Demonstration lectures given

- Aalto University School of Science and Technology (2010). Topic: Neural mechanisms of face perception. Rating: Excellent.
- University of Tampere, Department of Psychology (2005). Topic: Functional magnetic resonance imaging. Rating: Good.
- University of Turku, Department of Psychology (2003). Topic: Factor analysis. Rating: Excellent.

5. Research interests

Neural circuitry of emotions

Emotions guide organisms in constantly changing dynamic environments. In addition to providing rapid fight-or-flight responses during survival-salient encounters, emotions are also social signals that are expressed to other individuals, which provides important information for adjusting social interaction with that indivdual. In this line of research we use functional neuroimaging and state-of-the art behavioural and psychophsyiological responses for revealing the neural circuits that support i) perception of emotional signals including facial expressions, body postures and vocalizations, ii) generating subjective emotional feelings (i.e. conscious representations of emotional states) as well as iii) emotional contagion and empathy and the tendency to simulate emotional states observed in others.

Brain basis of social cognition

Understanding other peoples' minds is one of the most fundamental human skills but also one of the most demanding challenges our brains must pose every day: To understand each others' actions and intentions, we need to share internal neural representations of the external world across brains. In this neuroimaging project we aim at bridging the gap between classic social psychology and cognitive neuroscience by building a comprehensive neurocognitive model of how individuals maintain and communicate shared neural representations of the dynamic social world. The state-of-the-art theoretical and methodological developments of this project involve i) Studying brain basis of social interaction under naturalistic settings, ii) Quantification of neural and physiological response reliability across individuals to measure synchronization of participants social interaction, iii) tracking how social and emotional information flows from brain to brain during pseudo-hyperscanning' paradigms, and iv) fast Inverse Imaging (INI) acquisition for functional magnetic resonance imaging during social perception and interaction tasks to provide unparalleled temporal accuracy for fMRI.

Functional and molecular neural mechanisms of obesity

Diet and nutrition are critical factors in the maintenance of good health throughout the entire life course. Their role as determinants of chronic diseases such as obesity, diabetes and cardiovascular diseases is well established. Phenomenological similarities between obesity and addictive behaviours have led researchers to suggest that addictions may provide a framework for obesity. The most clearly established commonality of the mechanisms of drug and food intake is their ability to activate the dopamine containing link in the brain's reward systems. Although exaggerated sensitivity to high-calorie food cues may be a critical factor explaining obesity, the exact neural basis of the individual differences in food-induced reward and subsequent eating habits are not fully understood. Our multimodal PET - fMRI studies aim at determining how the tonic and phasic activity of the reward system predict self-reported eating habits and body mass. The functional data are complemented by structural MRI data, tractographic analyses of diffusion weighted data, and neurotransmitter (D2R and endogenous mu-opioid) PET studies.

6. Non-professional interests and hobbies

Playing trumpet
Photography
Classic Porsche sports cars