

# Specialisations and Research Topics in Cognitive Sciences at **ELTE Budapest**

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X-mas Meeting 2020

# ***Mei:CogSci at ELTE University***

Our students can choose to complete the MeiCogSci joint degree.

A collaborative Masters Program with the contribution of several Faculties and disciplines.

It offers research specialisations from diverse fields of scientific Research:

**Cognitive neuroscience** – lead by **István Czigler, Ferenc Honbolygó**

**Human Electrophysiology** – lead by **Zoltán Nádasdy**

**Comparative Ethology** - lead by **Ádám Miklósi, József Topál**

**Cognitive Psychology** – *Numerical Cognition, Attila Krajcsi and Social Minds*  
*Research groups - Ildikó Király, Categorisation, Anett Ragó*



**ELTE**

# Research Group of Neurocognitive Development, Hungarian Academy Sciences

István Czigler, Ferenc Honbolygó -  
honbolygo.ferenc@ttk.mta.hu



Investigating the neurocognitive mechanisms of **speech perception, reading, music, implicit learning and cognitive control in adults, children and infants**, with a special focus on clinical and developmental aspects, using the latest techniques of brain imaging (EEG, fMRI).

# Human Electrophysiology Group

Zoltán Nádasdy - [nadasdy.zoltan@ppk.elte.hu](mailto:nadasdy.zoltan@ppk.elte.hu)



- Studying the role of **oscillations** in perceptual processes using **EEG**
- Visual consciousness
- Development of **spatial cognition** and its relationship to the theory of mind
- **Time perception** and cognitive representation of time

Stationary and mobile EEG, VR environments



# Family dog project

**Ádám Miklósi** - [amiklosi62@gmail.com](mailto:amiklosi62@gmail.com)  
**Department of Ethology, ELTE**  
<http://familydogproject.elte.hu/>



## **Comparative analysis of social cognition in dogs and humans: Interdisciplinary approach**

### **Studying cognitive aging in dogs** (Eniko Kubinyi)

- The development of cognitive test battery to study the emergence of cognitive decline and use it to validate the effect of various treatments on cognitive performance in old subjects

### **Activation of social behaviour in dogs during interaction with autonomous agents** (Judit Abdai)

- Are dogs able to engage in social interaction with an agent?
- Do these interaction resemble human-dog relationship?
- Do dogs remember these agents based on embodiment and behaviour?

### **Interspecific attachment in cats to humans** (Marta Gácsi)

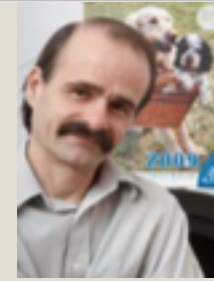
- Comparison of attachment behaviour in cats and dogs by looking at the effect of experience and development

### **Vocal communicative signals in dogs** (Tamás Faragó)

# Comparative Behavioural Research Group

**József Topál**

**Institute of Cognitive Neuroscience and Psychology,  
Hungarian Academy Sciences**



**I. Neglect syndrome in dogs:** Anna Kiss [vargane.kis.anna@ttk.mta.hu](mailto:vargane.kis.anna@ttk.mta.hu)

- Description of the neglect syndrome in dogs (using the side preference phenomenon known from cognitive tests as a starting point)
- Behavioural and neuro-physiological (EEG) characterisation of the affected dog population
- Comparision with human populations (neglect patients and healthy controls)

**II. Infant directed speech in dogs:** Gergely Anna [anna.gergely66@yahoo.com](mailto:anna.gergely66@yahoo.com)

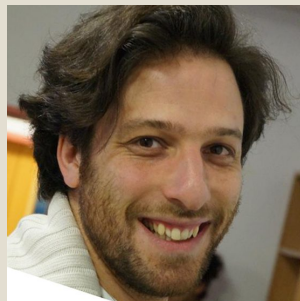
- Dogs also prefer infant directed speech?

# Social Minds Research Group + Baby Lab

<http://babalabor.hu>



Dr. Ildikó Király  
lab leader



Dr. Bálint Forgács  
post-doc researcher



Dr. Fruzsina Elekes  
post-doc researcher



Dr. Márton Nagy  
adjunct lecturer



Dr. Katalin Oláh  
post-doc researcher



Dr. Sunae Kim  
adjunct lecturer



Réka Pető  
PhD student



Júlia Baross  
PhD student, Lab  
manager



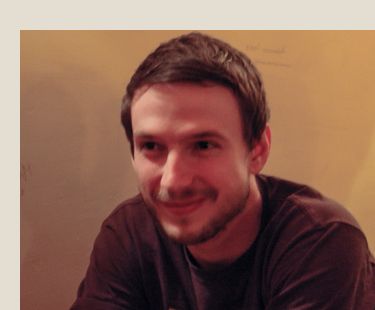
Andrea Hegedűs  
PhD student



Lívia Elek  
research assistant



Krisztina Andrási  
PhD student



Ágoston Galambos  
PhD student



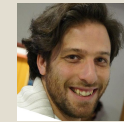
Krisztina Peres  
PhD student



The main focus of our studies is on different aspects of social cognition and episodic memory. Although our name indicates that we mostly do developmental work, in reality, we investigate most of the topics both in children and adults. Moreover, we are especially interested in the interaction of different social cognitive functions.

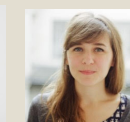
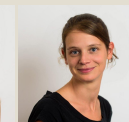
## THEORY OF MIND

- Spontaneous processes in perspective taking
- How do we update belief representations?
- Do we compute the beliefs of in-group and out-group members in a different way?



## NAÏVE SOCIOLOGY

- What cues do young children use to sort the social world into categories?
- What kind of inferences does group membership warrant for them?



## EPISODIC MEMORY

- Conscious and unconscious processes in relational retrieval
- Eye-movements as a measure of relational retrieval
- Episodic updating of belief representations
- Episodic memory in young children

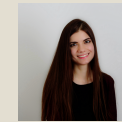
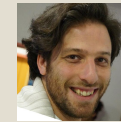






## LANGUAGE ACQUISITION

- The interdependence of theory of mind and language
- Understanding metaphors



## SOCIAL LEARNING

- Who do young children trust when learning novel information?
- Does the group membership of the teacher matter?
- How do children learn about object functions?



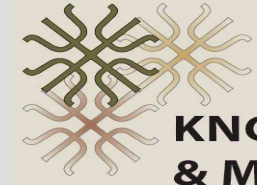
## JOINT TASK PERFORMANCE

- Encoding of information that is only relevant to a social partner (memory and object tracking)



# Knowledge and memory research group

## Anett Ragó - rago.anett@ppk.elte.hu



**KNOWLEDGE  
& MEMORY**  
RESEARCH GROUP



**COGNITIVE  
PSYCHOLOGY**  
DEPARTMENT

### ***From specific to general: Abstraction process, knowledge transfer***

Category learning mechanisms

Understanding and retrieval of visual events

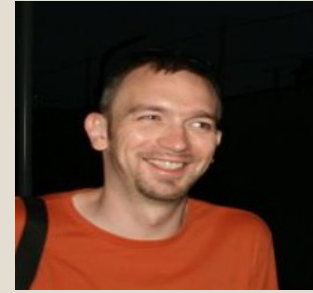
Specific projects in the past:

- Category learning mechanism in case of complex realistic visual stimuli
- Separating implicit and verbal learning mechanisms
- Understanding (visual) analogies
- Development in learning strategies: from kindergarteners to elderly



# Mathematical cognition research group

**Attila Krajcsi** - [krajcsi.attila@ppk.elte.hu](mailto:krajcsi.attila@ppk.elte.hu)



The role of number notations in numerical processing

Negative numbers

The development of counting abilities

<https://www.thenumberworks.org/>

Automatic statistical analysis software

<https://www.cogstat.org/>



# Decision Lab

Balázs Aczél - [aczel.balazs@ppk.elte.hu](mailto:aczel.balazs@ppk.elte.hu)



**ELTE**

One major focus of their research is to explore the mechanisms, **biases of human decision making** as well as **their mitigation**.

Main topics:

- Process-tracing of decision making
- Cognitive control mechanisms
- Choice architecture and nudge interventions
- Poverty and social mobility research



# Executive functions in healthy functioning & specific conditions

Alexander Logemann

alexander.Logemann@ppk.elte.hu



ELTE

Elucidating the mechanism of **executive functions** [predominantly attention & inhibitory control].

- In relation to **healthy functioning**.
- In relation to conditions such as **nicotine addiction and obesity**.
- Developing and evaluating novel approaches to improve the aforementioned mechanisms (especially in relation to specific conditions).

# Sleep & Cognition Lab

## Péter Simor

[www.budapestsleeplab.com](http://www.budapestsleeplab.com)



BUDAPEST LABORATORY OF  
SLEEP & COGNITION



**ELTE**

Their studies investigate the mechanisms and processes of sleep and dreaming in healthy and pathological conditions.

Research topics:

- The heterogeneity of **REM sleep**
- The neurophysiology of **Nightmare Disorder**
- Sleep quality and psychotic-like experiences
- Sleep and emotional memory processing
- Chronotype, synchrony and creative problem solving
- Chronotype and dream quality

# Cognitive abilities lab

## Kristóf Kovács



ELTE

### Research topics:

#### Individual differences in cognitive abilities

- process overlap theory
- structure of abilities
- the role of fluid/inductive reasoning
- ability differentiation

#### IQ and human intelligence

- measurement (incl. computerized adaptive testing)
- applications
- gender differences

#### Individual differences in working memory capacity and executive functions

- measurement
- modeling

# Human Interaction Research Group & Adaptation Research Group



ELTE

Human Interaction Research Group: **Katalin Varga** - [varga.katalin@ppk.elte.hu](mailto:varga.katalin@ppk.elte.hu)

**Behavioural, emotional, phenomenological** and psycho-physiological **changes occur** in the participants of **interpersonal situations**.

- hypnosis research
- The effect of suggestive communication
- clinical research in the fields of oncological, perinatal and intensive medical services

Adaptation Research Group: **Anna Veress-Szekely** - [szekely.anna@ppk.elte.hu](mailto:szekely.anna@ppk.elte.hu)

study **resilience** using an interdisciplinary research approach, implementing multiple levels of analysis perspectives based on genetic, developmental, physiological, demographic, cultural, economic and social variables.

- developmental differences
- intervention techniques utilizing biofeedback to promote resilience

# Any questions?

Ask me after the meeting on Discord!

Via email: [cogsci@ppk.elte.hu](mailto:cogsci@ppk.elte.hu)

**MSc Program details:**

<https://www.elte.hu/en/computational-and-cognitive-neuroscience-msc>

**INFO FOR VISITING STUDENTS FROM MEICOGSCI:**

<https://pszi.ppk.elte.hu/en/content/meicogsci-info-for-incoming-students.t.8212>

**Please always cc me, when writing directly to one of the researchers!**

**Thank you for your attention, hope to see you in Budapest soon!**