Work in Progress Symposium 2025

Program and Abstracts

ELTE | FACULTY OF EDUCATION AND PSYCHOLOGY

COGNITIVE PSYCHOLOGY DEPARTMENT

Program **Date and time:** Thursday, January 30, 2024, 9:30: AM **Location:** ELTE Psychology Institute, 1064 Budapest, Izabella u. 46, Room 101
9:30 - 10:30 Session 1: Memory
10:30 - 10:45 Break
10:45 - 12:15 Session 2: Development
12:15 - 13:15 Lunch Break
13:15 - 14:45 Session 3: Individual Differences & Methods
14:45-15:00 Break
15:00 - 16:00 Session 4: Brain & Behaviour

Schedule & Contents

9:30 - 10:30 SESSION 1

Memory

Chair: Richárd Reichardt

Connection of Sense of Direction and the Detailedness of Mental Maps

Empirical Research with Results

Dóra Hegyesi (ELTE Eötvös Loránd University, Budapest, Hungary, Institute of Geography and Earth Sciences, Department of Regional Studies)

The purpose of this study was to explore how mental mapping can be used as a research tool related to the underlying correlations of spatial thinking and spatial orientation. During this data collection participants (n=48) were asked to fill out a background survey and the Santa Barbara Sense of Direction Scale, and to draw a mental map of Budapest in Milgram's style. During the data analysis it was possible to identify the main quantitative elements that are correlated to a better sense of direction. The results also suggest, that the five type of elements on mental maps, suggested by Lynch, are closer to the organic ways of large scale spatial thinking, than solely drawing landmarks.

Keywords: Sense of Direction, Mental Mapping, Cognitive Maps, Quantitative Analysis

A New Method for Studying Spatial Memory

Pilot Study

Zsolt Ternei (ELTE Eötvös Loránd University, Budapest, Hungary, Human Electrophysiology Lab), Zoltán Nádasdy (Department of Cognitive Psychology, ELTE Eötvös Loránd University, Budapest, Hungary)

For the vast majority of spatial navigation research, experimental tasks were relegated to real-world environments. In recent decades an increasing trend towards virtual environments in spatial navigation research has emerged, which provides several benefits compared to their real-world counterparts, while also having certain limitations. With these properties in mind, we have developed a customizable virtual Gallery task that is apt for the assessment of both spatial navigation and memory within a highly controlled three-dimensional environment

Keywords: Spatial Navigation, Virtual Reality, Recognition Memory, Spatial Memory

An Alternative Version of the Corsi-Block Tapping Task to Measure Spatiotemporal Memory

Pilot Study

Soma Zsebi (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, EMIND Research Group), Patrícia Szabó (Doctoral School of Information Technology, University of Pannonia, Veszprém, Hungary, Faculty of Information Technology, Virtual Environments and Imaging Technologies Laboratory, Department of Electrical Engineering and Information Systems), Cecília Sik-Lányi (Faculty of Information Technology, University of Pannonia, Veszprém, Hungary, Virtual Environments and Imaging Technologies Laboratory, Department of Electrical Engineering and Information Systems), Renáta Cserjési (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, EMIND Research Group)

The Corsi-Block Tapping Task is originally thought to be a tool used to measure spatial memory, however, some researchers have pointed out that due to its sequentially presented nature and the constant location of the blocks, it might rather measure temporal order memory. In order to further investigate this measure, we have developed an alternative version to the original consisting of three different stages, which we consider to measure spatial, temporal and spatiotemporal memory separately. We are further developing a computerized version of it for more exact testing and to measure the allocentric version of the task..

Keywords: Spatial, Temporal, Spatiotemporal, Memory, Corsi

Selective Memory in Children

Empirical Study with Results

Carlos Magzel (ELTE Eötvös Loránd University, Budapest, Hungary), Ildikó Király (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Social Minds Research Group), Sunae Kim (University of Oxford, Oxford, UK), Michal Reifen (Reichman University, Israel)

Adult studies suggest that collective memory and selective remembering are more likely to occur when speakers and listeners share group membership. This study explored whether children, like adults, display concurrent retrieval influenced by group membership. Building on Hirst and Coman's (2015) adult design, Arab-Israeli children (ages 8–13) learned about a summer camp program and then listened to either an in-group (Arab-Israeli) or out-group (Jewish-Israeli) speaker who selectively shared camp details, followed by a recall test. The results showed that Arab-Israeli children were more likely to demonstrate Socially Shared Retrieval-Induced Forgetting (SS-RIF)—a phenomenon where recalling specific details impairs memory for unmentioned ones—when the speaker was an in-group member versus when the speaker was an out-group member. These findings expand on Hirst and Coman's work, offering a developmental perspective on SS-RIF in children. This research highlights how social influences shape memory in children and contributes to understanding the interplay between group dynamics and cognitive processes.

Keywords: Socially Shared Retrieval-Induced Forgetting, Collective Memory, Social Categorization

10:45 - 12:15 SESSION 2

Development

Chair: Gerda Szalai

Affect Contagion and Learning: Maternal Stress Influences Preverbal Infants' Object-Directed Behavior

Empirical Study with Results

Zsófia Ginter (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Social Minds Research Group)

The present study investigated whether maternal stress influences 18-month-old infants' object-directed behavior in an imitation procedure. In our experiment, infants (n=37) participated in a deferred imitation task while sitting in their mothers' lap, after mothers in the test condition completed a quiz inducing mind mental stress. The stress manipulation was successful, as confirmed by a self-report scale as well as parents' recorded heart rate. Analyses of infants' behavior have shown that infants whose mothers underwent the stress manipulation were significantly less likely to reproduce the demonstrated acts and were more hesitant to explore the novel objects. Maternal trait anxiety and difficulties in emotion regulation did not determine infants' imitation scores, confirming that the effects observed were due to situational stress. Taken together, our findings have implications regarding parental influence on affective and cognitive development and expand our knowledge on the underlying mechanisms of emotion contagion and affective social learning.

Keywords: Co-regulation, Emotion Contagion, Affective Social Learning, Stress

How Do We Reason About Social Partners During Video Chat Interactions? - Preschoolers' Theory of Mind Performance in Virtual Space

Empirical Study with Results

Alexandra Kelemen (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Social Minds Research Group) András Sziklai (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Social Minds Research Group), Ildikó Király (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Social Minds Research Group)

How do we reason about our social partners in virtual environments? Virtual space is becoming increasingly popular, made all the more significant by the Covid-19 pandemic. Similarly to adults, children are also increasingly prompted to operate in virtual environments and interact there with others, which raises the question of how they would apply their Theory of Mind (ToM) capacity in these special contexts. Abilities related to ToM develop rapidly during the early years of childhood,

with children gradually progressing from the recognition of Diverse Desires to the interpretation of Real-Apparent Emotions, through the understanding of Diverse Beliefs and False Beliefs (Wellman and Liu, 2004). However, our understanding of how children follow and process others' potential mental states in virtual space remains limited. We would like to examine whether 4-year-old children think differently about others' knowledge and beliefs in virtual spaces in comparison to meeting them in person. We hypothesise that given the limited access to information about others for children in an online environment, children will consider this limitation, and thus their Theory of Mind attributions will be impacted (planned sample size n=66).

Keywords: Cognitive Development, Theory of Mind, Virtual Space

The Effect of the Lockdowns During COVID-19 Pandemic on Children's Socio-Cognitive Skills

Empirical Study with Results

Tamás Németh (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary), Dr. Veronika Konok (ELTE Eötvös Loránd University, Budapest, Hungary, Ethology Department), Dr. Ákos Pogány (ELTE Eötvös Loránd University, Budapest, Hungary, Ethology Department)

In this research, we investigated the impact of the Covid-19 pandemic lockdown on preschoolers' Theory of Mind (ToM) development. Our findings indicate that children who attended preschool after the lockdown demonstrated better outcomes in first-order ToM development. For second-order ToM development, we observed similar results regardless of whether children attended preschool during or after the lockdown. In the Real-Apparent Emotions test, weaker development was found both among children who spent their preschool years at home during the lockdown and those whose preschool years occurred after the lockdown.

Keywords: Theory of Mind (ToM), Covid-19, Lockdown, Socio-Cognitive development, Preschoolers' Development

Stability of Reading and Spelling Difficulties Among Hungarian Elementary School Children

Empirical Study with Results

Claudia Laskay-Horváth (ELTE PPK Pedagógiai és Pszichológiai Intézet, Szombathely, ELTE PPK Pszichológiai Intézet, Budapest, ELTE PPK Pszichológiai Doktori Iskola, Budapest), Kemény, Ferenc (University of Graz, Faculty of Natural Sciences, Department of Psychology, Graz, ELTE PPK Pedagógiai és Pszichológiai Intézet, Szombathely)

Aim. Despite their strong correlation, reading and spelling can be impaired selectively or combined. This study investigates the stability of literacy impairments and cognitive predictors in Hungarian 2nd- to 6th-grade students. Methods. Based on their reading and spelling skills, we categorized 189 children into reading and spelling deficit, isolated reading deficit, isolated spelling deficit, and typically developing groups. We assessed literacy skills along with phonological awareness, morphological

awareness, and rapid automatized naming after 1–3 semesters. Results. The combined deficit and typically developing groups showed high stability, whereas isolated reading (36%) and spelling (42%) deficit groups were less stable. Children who improved their spelling skills in the isolated spelling deficit group performed better on the phonological awareness task than children who remained impaired. No such difference was observed in the isolated reading deficit group. These findings highlight the variable stability and cognitive underpinnings of literacy impairments.

Keywords: Literacy, Development, Deficit, Stability, Children

The Relationship Between Literacy Deficits and Arithmetics

Empirical Study with Results

István Tafferner (ELTE PPK Pedagógiai és Pszichológiai Intézet), Laskay-Horváth, Claudia (ELTE PPK Pedagógiai és Pszichológiai Intézet, Szombathely, ELTE PPK Pszichológiai Intézet, Budapest, ELTE PPK Pszichológiai Doktori Iskola, Budapest), Kemény, Ferenc (University of Graz, Faculty of Natural Sciences, Department of Psychology, Graz, ELTE PPK Pedagógiai és Pszichológiai Intézet, Szombathely)

Specific learning disorders rarely occur alone. Having one specific learning disorder multiplies the chance of having comorbid deficits. The high comorbidity between dyslexia and dyscalculia suggests a common cognitive mechanism underlying the aetiology of the disorders. Our study investigates the common language-based cognitive mechanisms behind the disorders. We recruited primary school children with isolated spelling deficits (n = 26), isolated reading deficits (n = 19), combined spelling and reading deficits (n = 34), and typically developing children (n = 46). We investigated the arithmetic performance of these groups of children, and whether cognitive skills can explain the group differences found. The phonological awareness and lexical access skills of the combined deficit group was the lowest across groups. IQ did not differ between groups. While the arithmetic performance of the deficit groups were also significantly smaller, this difference disappeared after controlling for phonological awareness or lexical access, suggesting common linguistic background.

Keywords: Dyslexia; Arithmetics; Phonological Awareness; Lexical Access; Learning Disorders

13:15 - 14:45 SESSION 3

Individual Differences & Methods

Chair: Attila Krajcsi

Grammatical Gender Interferes with Numerical Magnitude

Empirical Study with Results

Daria Kuznetsova (ELTE Eötvös Loránd University, Department of Cognitive Psychology, Budapest, Hungary), Petia Kojouharova (Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary), Penka Hristova (Department of Cognitive Science and Psychology, New Bulgarian University, Sofia, Bulgaria), Attila Krajcsi (ELTE Eötvös Loránd University, Budapest, Hungary, Numerical Cognition Research Group)

Numerical magnitude can interfere with other cognitive properties, such as response side (SNARC) or parity (PNARC). The SNARC effect is often attributed to interference from the approximate number system (ANS) with spatial orientation. In contrast, the PNARC effect is explained by categorical associations, such as evenness being linked to smaller values. To investigate the categorical association account, the present study examined whether grammatical gender can interfere with numerical magnitude, focusing on native speakers of Bulgarian and Russian. Participants performed parity and number comparison tasks after making grammatical gender decisions on words. Initial findings revealed gender-number interference in the Bulgarian but not in the Russian sample. Additional analyses and a literature review were conducted to explore possible explanations for this effect.

Keywords: Numerical Cognition, Interference

Influence of Task Instructions on The Effect Size of the SNARC-Effect

---

Empirical Study with Results

Dávid Csúri (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Numerical Cognition Research Group) Attila Krajcsi (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Numerical Cognition Research Group)

The SNARC-effect, or space-number association of response codes is a numerical interference, which concludes that we respond faster to smaller numbers with the left response side and that we respond faster to larger numbers with the right response side during binary decision tasks. Previous studies demonstrated that the slower the participants respond, the bigger the effect size, and that the SNARC-effect is more pronounced in late responses. Based on these findings, we investigate

whether the effect size can be increased by instructing the participants to respond more precisely, thus slowing their responses down, rather than asking them to respond more quickly. We replicated the SNARC-effect, but the task's instructions did not influence the effect size. This could be because increasing reaction time by instructions modifies different parameters of the SNARC-effect than when it is increased or decreased by individual variety or the features of the paradigm.

Keywords: SNARC-effect; numerical; interference; cognition; association

Retrospective Perception of Causality

Pilot Study

Daniel Bermudez (Middle European Interdisciplinary Master's Programme in Cognitive Science, Eötvös Loránd University, Budapest, Hungary), **Mimi Klinec** (Middle European Interdisciplinary Master's Programme in Cognitive Science, University of Ljubljana, Ljubljana, Slovenia), Zoltán Nádasdy Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Human Electrophysiology Research Group, Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary)

Human cognition uses two kinds of causality. One is perceptual, the other is inferential. Perceptual causality was first studied experimentally by Albert Michotte through the "launching effect" which happens at the collision of two objects when moving object A causes object B to move. He showed that under specific conditions the launching illusion is irrevocably evoked. In this study, we combine causality with apparent motion and demonstrate that, contrary to our subjective experience, the perception of causality is established retrospectively. Analysis of our pilot data strongly supports this hypothesis and motivates further experiments.

Keywords: Causality, Perception, Ambiguous Motion, Launching Effect

Pain Perception in Awake and Hypnotic State - Biofeedback in Interactional Paradigm

Empirical Study with Results

Zsuzsanna Besnyő (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Human Interaction Research Group), Professor Katalin Varga (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Human Interaction Research Group), Zoltán Kekecs (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Behavioral Medicine and Research Credibility Laboratory), Anna Veres-Székely (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Adaptation Research Group)

In our study we intended to explore the realm of synchronicity between the hypnotist and the participant during cold pressor task in interaction approach framework. Our goal was to measure sensory perception during analgesia suggestions in light of hypnotic susceptibility (measured later). How can participants manage, elaborate acute pain, how could this manifest in their electro dermal

activity (EDA)? The parallel EDA measuring has been applied to understand the vegetative, sensory explicit, implicit connection between the two persons. The relationship between pain management techniques and hypnotic susceptibility is also analysed. We also looked for strategies that participants use to induce hypnoanalgesia and assess the factors associated with the strategies which yield to the individual phenomenological analgesia field. In this study we would like to understand how hypnotist and participant can make strong connections during hypnosis and how can a hypnotist reach another person intuitively. Data analysis is ongoing yet.

Keywords: Analgesia, Biofeedback, EDA, Elkins Hypnotizability Scale, Interaction Approach

Daily Dynamics of the Temporal Orientations of Mind Wandering: Chronotype Matters!

Empirical Study with Results

Miha Likar (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Institute of Psychology), Bernadett Becz (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Institute of Psychology), Vivien Tomacsek (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Institute of Psychology), Péter Simor (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Institute of Behavioural Sciences, Semmelweis University, Budapest, Hungary; IMéRA Institute for Advanced Studies of Aix-Marseille University, Marseille, France)

Theoretical accounts link mind wandering (MW) with attentional and executive processes, both of which exhibit time-of-day fluctuations influenced by chronotype. Similar circadian dynamics have been suggested for MW. We examined how chronotype and time-of-day effects influence the frequency and temporal orientation of MW, hypothesizing that MW would occur more frequently during non-preferred times of the day. 152 participants were involved in an ecological momentary assessment (EMA). Chronotype predicted the overall frequency of MW as eveningness was associated with more, while morningness with less overall MW. In addition, a pronounced circadian effect was observed, as MW frequency declined over the course of the day regardless of chronotype. Daily dynamics of the temporal orientation of MW were significantly predicted by chronotype: While the proportion of future-oriented thoughts increased and that of present-oriented thoughts decreased throughout the day in evening chronotypes, the opposite was found for morning chronotypes.

Keywords: Mind Wandering, Temporal Orientation, Experience Sampling, Chronotype, Circadian Rhythms

Why are You Talking Like That? - The Influence of Personality Traits on Speech Styles

---

Research Plan

Édua Koós-Hutás (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; HUN-REN Research Centre for Natural Sciences, Institute of Cognitive Neuroscience and Psychology, Budapest, Hungary), József Topál (HUN-REN Research Centre for Natural Sciences, Institute of Cognitive Neuroscience and Psychology, Budapest, Hungary; NAP 3.0 Comparative Ethology Research Group), Anna Gergely (HUN-REN Research Centre for Natural Sciences, Institute of Cognitive Neuroscience and Psychology, Budapest, Hungary; NAP 3.0 Comparative Ethology Research Group)

Adjusting speech style is crucial for effective communication, particularly with the addressee's limited linguistic competence. Despite the known impact of parental personality traits on parent-child interactions, understanding individual differences across speech registers remains narrow. Research indicates that higher Extraversion and Agreeableness, alongside lower Neuroticism, correlate with greater parental responsiveness. This study combines data from three comparative studies to investigate the influence of personality on infant-directed speech (IDS), dog-directed speech (DDS), and adult-directed speech (ADS), focusing on nuanced behavioural levels. We plan to analyse the relationship between the speaker's personality traits and their multimodal speech prosody. We hypothesise that playful interactions (e.g. resulting in wider pitch range and intense positive facial expressions) are related to Extraversion and Agreeableness, while Conscientiousness and Neuroticism may influence more moderate prosody (e.g. visual prosody in DDS or acoustic prosody in ADS).

Keywords: Personality Traits, Multimodal Speech Prosody, Comparative Cognition

15:00 - 16:00 SESSION 4

Brain & Behaviour

Chair: Alex Ilyés

Social N400 and False Beliefs - Category Level or Individual Tokens?

Empirical Study with Results

Balint Forgács (ELTE Eötvös Loránd University, Budapest, Hungary, Institute of Psychology, Language and Brain Research Group); **Anita Jojic** (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary, Institute of Psychology, Language and Brain Research Group).

The N400, traditionally viewed as a marker of semantic incongruity at the individual level, has been shown to be elicited in social contexts when individuals process semantic incongruities experienced by others. This negative deflection, observed during situations like object mislabeling in the presence of others, is termed the Social N400. Recent studies have extended the investigation of the Social N400 to contexts involving false beliefs of social partners, particularly when such beliefs involve category mismatches. While robust evidence supports the elicitation of the Social N400 under these conditions, the question remains whether this response can also be triggered at the token level—for example, when distinguishing between individual exemplars of the same category. The current study seeks to address this gap by exploring whether the Social N400 is elicited in adults during token-level semantic processing in social contexts. This investigation aims to deepen our understanding of the mechanisms underlying belief tracking and language comprehension in adults.

Keywords: N400, Social N400, False Beliefs, Social Cognition

Behavioural Correlates of Lateralized Novel Meaning Making in Metaphors, Abstract and Concrete Expressions

---

Empirical Study with Results

Márton Munding (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Institute of Psychology), Alex Roland Ilyés (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary, Institute of Psychology), Bálint Forgács (Department of Cognitive Psychology, Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary Department of Experimental and Neurocognitive Psychology, Freie Universität Berlin, Germany)

The involvement of the right hemisphere (RH) in metaphor processing has been a debated topic in psycholinguistics, with novelty being one of the key underlying factors identified (Forgács, 2014). In

the current study we tested hemispheric processing differences in novelty language material, with emphasis on differences between concrete and abstract language processing. Participants (n=37) were shown novel adjective-noun expressions of four semantic categories (abstract-literal, concrete-literal, metaphorical, unrelated) in a semantic decision task utilizing a divided visual field paradigm. Participants had to indicate with a button press whether the expressions were meaningful or not, while their reaction time (RT) and accuracy were measured. Our analysis shows no RT difference between the novelty matched meaningful semantic categories when controlled for psycholinguistic variables, supporting the notion that figurativeness might not be the key factor in RH language processing involvement during metaphor processing.

Keywords: Hemispheric Lateralization, Language Processing, Metaphors

Assessing Mnemonic Discrimination and Implicit Memory of Incidentally Registered Irregular and Regular Events - A Visual Mismatch Negativity Study

---

Research Plan

Lili Kővári (Doctoral School of Psychology, Eötvös Loránd University; Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences), Petia Kojouharova (Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences), Zsófia Anna Gaál (Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences), István Czigler (Institute of Cognitive Neuroscience and Psychology, HUN-REN Research Centre for Natural Sciences)

Recent acoustic studies have found that the magnitude of MMN (mismatch negativity), a neural marker of automatic regularity-violation, correlates with the precision of sensory representations formed from incidentally encoded, unattended stimuli, as shown by subsequent mnemonic discrimination. Building on this, we aim to examine the representation of automatically registered visual stimuli. Participants will undergo a passive oddball paradigm, viewing a sequence of faces with a frequent (standard) emotion intermixed with an infrequent (deviant) emotion of the same identities, counterbalanced as standard or deviant. Later, participants will see either the previously seen oddball stimuli (targets), similar but not identical stimuli (lures), or novel ones (foils). Half will perform an old/new/similar judgment, while the others passively view the stimuli to assess implicit memory. We hypothesize that automatically acquired saliency enhances subsequent recognition, both explicitly and implicitly.

Keywords: EEG, ERP, vMMN, Mnemonic Discrimination

What is the Meaning of the Hexagons

Research Plan

Zoltán Nádasdy (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Human Electrophysiology Research Group), Attila Keresztes (Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Lifespan Memory Development Lab), Hunor Kis (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Lifespan Memory Development Lab), Li Zihan (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Human Electrophysiology Research Group), **Borbála Emese Varga** (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Human Electrophysiology Research Group)

A decade ago a new fMRI technique approved the presence of grid cells in the human entorhinal cortex by discovering a hexagonal activity pattern for spatial navigation tasks and for other categorical learning tasks. This pattern appeared across many locations in the brain, which suggest a more general role in information processing and communication between brain areas. However, a true control experiment for these studies has yet to be seen. Here we compare fMRI BOLD signals for an object search spatial navigation task in two distinct virtual environments: 1. in a hangar (20m x 20m) with distal and proximal landmarks, 2. a larger open space (desert) without distal and scarce proximal landmarks. Based on previous research, hexadirectional modulation (HDM) should not be present in the desert condition while navigation is not impaired, although if HDM appears it would mean that it is solely a coincidental artefact of the technique itself.

Keywords: fMRI, Grid Cells, Dimensions, Hexadirectional Modulation

Assessing the Conceptual Knowledge of Hungarian Children Aged 6 - 8 via a 'Concept Norm'

Research Plan

Alex Ilyés (Doctoral School of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary; Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary), Borbála Brosig (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary), Anna Illés (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary), Donát Keszthelyi (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary), Éva Kovaliczky (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary), Boróka Ferencz (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary; Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary), Markos Petridis (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary), Dan Filatov (Faculty of Education and Psychology, ELTE Eötvös Loránd University, Budapest, Hungary), Attila Keresztes (Brain Imaging Centre, HUN-REN Research Centre for Natural Sciences, Budapest, Hungary; Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary)

Theories of conceptual meaning representation suggest that distributed networks of semantic features activate during concept use. Supporting results highlight that the statistical characteristics of concept-related features influence categorization, behavioural processing, as well as the neural representational similarities of concepts. ‘Concept norms’ are standard tools for mapping these distributed networks based on statistical regularities in verbally produced feature lists. Although recent advances in large language modelling provide accessible databases of language regularities, they are less effective in capturing semantic organization of developmental populations. Our goal is to create a feature-based database of common Hungarian concepts using responses of 6- to 8-year-old children. We are currently developing a web-based child-friendly experimental platform to collect the feature lists. We will use these lists to construct a frequency-based vector space to understand how children represent concept meanings, and to aid the creation of future developmental experimental paradigms seeking to parametrically manipulate conceptual similarity.

Keywords: Semantic Memory, Categorization, Conceptual Similarity, Property Norms, Development