SLC Student Research Awards

2014 Mid-Year Meeting
July 9-11, 2014
Jerusalem, Israel

The INS Student Liaison Committee, in conjunction with the INS Program and Awards Committees, recognizes the following five students as recipients of the **SLC Student Research Award**.

Oren Civier, PhD

Post-Doctoral Fellow

Bar-Ilan University

Reduced Fractional Anisotropy in the Anterior Corpus Callosum Predicts Reduced Speech Fluency in Persistent Developmental Stuttering

O. Civier, V. Kronfeld-Duenias, O. Amir, R. Ezrati, M. Ben-Shachar

Where to see this presentation

Paper Session 5: Language
Wednesday, July 9, 2014 at 3:30 PM (Zion Hall A)

Objective: Developmental stuttering is a prevalent disorder, characterized by frequent speech disfluencies. White matter anomalies are reported in stuttering individuals, but their functional significance is unclear. We sought to examine this question by analyzing the relation between white matter properties and level of speech fluency in adults who stutter.

Participants and Methods: We used diffusion tensor imaging with tract-based spatial statistics, and assessed speech fluency and diffusion properties of white matter in 14 adults who stutter and 14 matched controls.

Results: We detected a region in the anterior corpus callosum with significantly lower fractional anisotropy in adults who stutter relative to controls. Within this region, lower fractional anisotropy values predict reduced speech fluency in adults who stutter. In addition to these findings, a statistically significant interaction was found between group and age in two other regions: the left Rolandic operculum and the left posterior corpus callosum.

Conclusions: The correlation results suggest that the callosal anomaly in the stuttering group does not indicate beneficial neuroplasticity. As a whole, our findings are consistent with the hypothesis that developmental stuttering is associated with structural anomalies in the left hemisphere, including the left Rolandic operculum, and that recruitment of the right frontal cortex through callosal changes is an undesirable outcome. We discuss the implications of these findings for current models of intact speech production.

Acknowledgment: This study is supported by the Israel Science Foundation [513/11 to M.B.-S and O.A], and by a Marie Curie International Reintegration Grant [DNLP 231029 awarded to M.B.-S. by the European Commission]. O.C. and V.K. Dare supported by the Israeli Center of Research Excellence in Cognition [I-CORE Program 51/11]. O.C. is also supported by the Center for Absorption in Science, Ministry of Immigration Absorption, The State of Israel.

Irene Huenges Wajer, MSc

Doctoral/PhD Student

University Medical Center Utrecht

Relationship Between CT-perfusion on Admission and Cognitive Functioning 3 Months After Aneurysmal Subarachnoid Hemorrhage

I. Huenges Wajer, C. Cremers, M. van Zandvoort, M. Vergouwen, I. van der Schaaf, B. Velthuis, J. Dankbaar, P. Vos, A. Visser-Meily, G. Rinkel

Where to see this presentation

Paper Session 14: Cognitive & Behavioral Neurology
Friday, July 11, 2014 at 12:00 PM (Zion Hall B)

Objective: Many patients who survive an aneurysmal subarachnoid hemorrhage (aSAH) have persisting cognitive dysfunctions. The underlying causes of these dysfunctions are however not completely clear. In the acute phase after aSAH cerebral blood flow (CBF) is reduced. The aim of this study is to investigate the relationship between CTperfusion (CTP) in the acute phase and cognitive outcome 3 months after aSAH.

Participants and Methods: We included a series of 71 patients admitted to the University Medical Center Utrecht with a routine CTP performed within 24 hours after ictus and with a neuropsychological examination after 3 months. Perfusion parameters were measured in predefined regions of interest, after which absolute and relative values for two parameters: CBF and time to peak were calculated. The relationship with global cognitive functioning was examined by linear regression analyses. Adjustments for age, sex, education, method of aneurysm treatment and presence of non-acute medical complications were made if significantly associated with cognition.

Results: A significant relationship was found between age and cognitive functioning (B=-.02, 95% CI -.030 to -.007). After adjustment of age, both the absolute and relative perfusion parameters were not significantly associated to global cognitive functioning.

Conclusions: Perfusion in the acute phase is not associated to cognitive outcome 3 months after aSAH and therefore cannot explain the neuropsychological dysfunctions in the long term.

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Monica Toba, PhD

Post-Doctoral Fellow

L'Institut du Cerveau et de la Moelle Épinière

Neuroanatomy of Visuo-Spatial Neglect: A Game-Theoretical Analysis Approach

M. Toba, M. Zavaglia, F. Rastelli, C. Hilgetag, A. Valero-Cabre

Where to see this presentation

Poster Session 2: Attention, Autism, Emotion, Epilepsy, Genetics, Laterality, Infectious Disease, Imaging, Learning Disabilities, & Visuospatial Functions
Wednesday July 9, 2014 at 2:00 PM (Zion Hall D and West & North Foyers)

Objective: Right brain-damaged patients with visuo-spatial neglect usually fail to respond to left-sided objects and deviate rightwards when bisecting horizontal lines. Here, we explored the anatomical correlates for the performance of neglect patients in a line bisection test, using a novel game-theoretical analysis. We aimed at deriving contributions of several right-hemispheric cortical regions-of-interest (ROI) to attentional orienting.

Participants and Methods: Performance in the line bisection task together with the corresponding lesion patterns were explored through a Multi-perturbation Shapley value Analysis (MSA) (Keinan et al. 2004) in 24 neglect patients (> 2 months post-stroke). MSA is a rigorous game-theory-based method to infer causal regional contributions from behavioural performance after multiple lesions, treating brain regions as players in a coalition game. Four right hemisphere ROIs important in visuo-spatial attention were used in the analysis: frontal eye field (FEF), intraparietal sulcus (IPS), inferior frontal gyrus (IFG), temporo-parietal junction (TPJ) and one region representing the 'rest of the brain'. Overlap (in %) between infarct lesions and each ROI was calculated for each patient.

Results: The analysis of this patients sample revealed that contributions computed with MSA were significantly different from zero for all the ROIs considered. Highest contributions were observed for the IPS and TPJ. Functional interactions derived from MSA also revealed synergisms between IFG and all the other regions (IPS, FEF and especially TPJ) and the 'rest of the brain'.

Conclusions: The contribution of the IPS to attentional orienting was repeatedly emphasized. By using a game theory-based method, we could infer the pivotal role of functional interactions between TPJ and IFG for the attentional orienting. The understanding of causal contributions of brain regions to mental functions implies important consequences for the rehabilitation of brain-damaged patients.

Naama Mayseless

Doctoral/PhD Student

University of Haifa

Modulating Creativity by Altering the Balance Between Right and Left Inferior Frontal Gyrus with tDCS

N. Mayseless, S. Shamay-Tsoory

Where to see this presentation

Paper Session 12: Cognitive Neuroscience (B)
Friday, July 11, 2014 at 10:30 AM (Zion Hall B)

Objective: Creativity is defined as the ability to produce responses that are both novel (i.e., original and rare) and suitable (i.e., useful). Previous research indicated that while regions in the right hemisphere are implicated in the production of new ideas, damage to the left inferior frontal gyrus (IFG) is associated with increased creativity, indicating that left IFG damage may have a "releasing" effect on creativity. To examine this, in the present study we used transcranial direct current stimulation (tDCS) to modulate activity of the right and the left IFG.

Participants and Methods: Sixty healthy adults participated in two experiments. In the first experiment participants were administered bilateral tDCS stimulation, with the cathodal electrode placed over the LIFG and the anodal over the RIFG (L-R+) for Group 1, or with the cathodal electrode placed over the RIFG and the anodal over the LIFG (L+R-) for Group 2. In the second experiment we were interested in testing the unilateral effect of either diminishing activity in the left IFG (Group 1) or enhancing activity in the right IFG (Group 2). Each participant took part in only one stimulation session, receiving both stimulation and sham counterbalanced. During stimulation, participants completed the Alternate Uses tasks and a verbal fluency task.

Results: In the first experiment we show that whereas anodal tDCS over the right IFG coupled with cathodal tDCS over the left IFG increases creativity, the reverse stimulation does not affect creative production. To further confirm that only alteration of the balance between the two hemispheres is crucial in modulating creativity, in the second experiment we show that neither unilateral cathodal tDCS over the left IFG nor unilateral anodal tDCS over the right IFG results in changes in creativity.

Conclusions: These findings support the balance hypothesis, according to which creativity requires a balance of activation between the right and the left frontal lobes, and more specifically, between the right and the left IFG.

Hila Zadka, MA

Doctoral/PhD Student

The Hebrew University of Jerusalem

Patients with Parkinson's Disease Are Able to Learn in a Probabilistic Feedback-Based Learning Environment When Level of Uncertainty Is Reduced

H. Zadka, H. Bergman, E. Vakil

Where to see this presentation

Paper Session 10: Cognitive Neuroscience (A)
Thursday, July 10, 2014 at 3:45 PM (Zion Hall B)

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