

## Thursday Interdisciplinary Colloquium

### Tel Aviv University

The Adams Super Center for Brain Studies  
The Shirley and Leslie Porter School of Cultural Studies  
Department of Linguistics

### *Symposium on Brain and Language*

#### *שפה ומח*

*Thursday, 13.03.2014, 16:15-17:45*

*Faculty of Medicine, room 120*

#### **Speakers:**

- **Orna Peleg**, Cognitive Program of Language Use, Tel Aviv University  
*The Relationship between Orthographic, Phonological and Semantic Representations in the Two Cerebral Hemispheres*  
*הקשר בין אורתוגרפיה פונולוגיה וסמנטיקה בשתי המיספרות המח*
- **Aya Meltzer-Asscher**, Linguistics Department and Sagol School of Neuroscience, Tel Aviv University  
**Cynthia K. Thompson**, Aphasia and Neurolinguistics Research Lab, Northwestern University  
*The Forgotten Lexical Category: Adjective Production in Agrammatic Aphasia*  
*הקטגוריה הלקסיקלית הנשכחת: ייצור שמות-תואר באפאזיה אגרמטית*
- **Nira Mashal and Shlomit Mezuyanim**, School of Education, Bar-Ilan University  
*Can Brain Stimulation Improve Metaphoric Comprehension?*  
*האם גרייה חשמלית מוחית יכולה לשפר הבנה מטפורית?*

#### **Abstracts:**

*הקשר בין אורתוגרפיה, פונולוגיה וסמנטיקה בשתי המיספרות המח*  
*The Relationship between Orthographic, Phonological and Semantic Representations in the Two Cerebral Hemispheres*

#### **Orna Peleg**

Cognitive Program of Language Use  
Tel Aviv University

Research investigating hemispheric differences in word semantic processing

propose that the left hemisphere (LH) uses a fine semantic coding to quickly select relevant meanings, while the right hemisphere uses a coarse semantic coding scheme, in which it weakly activates a broad spectrum of meanings (e.g., Jung-Beeman 2005). According to this proposal, when readers encounter homophonic homographs such as *bank*, the LH quickly selects the appropriate meaning, while the RH maintains competing meanings.

In a series of divided visual field experiments (Peleg & Eviatar 2008, 2009, 2012; Peleg, Markus, & Eviatar 2012, in preparation) we demonstrate that this conclusion is too strong and that hemispheric differences in meaning activation and selection may be eliminated and even reversed in the case of heterophonic homographs such as *tear*. These findings are consistent with the view that hemispheric differences in the connectivity between orthographic, phonological and semantic representations underlie hemispheric asymmetries in the time course of meaning activation and selection.

*The Forgotten Lexical Category:  
Adjective Production in Agrammatic Aphasia*  
הקטגוריה הלקסיקלית הנשכחת: ייצור שמות-תואר באפאזיה אגרמטית

**Aya Meltzer-Asscher**

Linguistics Department and Sagol School of Neuroscience  
Tel Aviv University

**Cynthia K. Thompson**

Aphasia and Neurolinguistics Research Lab  
Northwestern University

In contrast to nouns and verbs, the use of adjectives in agrammatic aphasia has not been systematically studied. However, since adjectives share some properties with nouns and others with verbs, analysis of adjective production is important for testing theories of production deficits in agrammatism. The current study compared the use of adjectives in agrammatic and healthy individuals, focusing on overall adjective production rate, production of predicative and attributive adjectives, and production of adjectives with complex argument structure. Narratives elicited from 14 agrammatic and 14 control participants were coded as part of the study. Results showed that agrammatic speakers used adjectives in normal-like proportions, suggesting that agrammatism does not involve an inherent difficulty with predication or with low imageability words. However, agrammatic speakers exhibited an increased proportion of predicative adjectives and a decreased proportion of attributive adjectives compared to controls, in line with previous findings of difficulty with adjunction in agrammatism. Additionally, agrammatic participants produced adjectives with less complex argument structures than controls, on a par with their argument structure deficits in the verbal domain.

*Can Brain Stimulation Improve Metaphoric Comprehension?  
האם גרייה חשמלית מוחית יכולה לשפר הבנה מטפורית?*

**Nira Mashal and Shlomit Mezuyanim**

School of Education

Bar-Ilan University

This work examines the use of transcranial Direct Current Stimulation (tDCS) to improve metaphoric comprehension among healthy young adult Hebrew speakers. tDCS is a noninvasive, painless cortical neuromodulation technique that modifies spontaneous neuronal excitability using a low intensity electrical current (2 mA). Depending on the polarity of the current flow, brain excitability can either be increased (anodal tDCS) or decreased (cathodal tDCS). Comprehension of unfamiliar metaphors is an effortful cognitive process that requires the formation of a novel metaphoric mapping between two disparate domains during which irrelevant properties have to be suppressed. Previous studies have shown that comprehension of both unfamiliar and familiar metaphors is associated with working memory capacity.

Here, we investigate whether tDCS can improve metaphoric comprehension and working memory performance. tDCS was applied over the bilateral dorsolateral prefrontal cortex (DLPFC), a key area in metaphor comprehension and working memory. We will show preliminary results of six days brain stimulation during which eight participants performed a metaphoric comprehension and an N-back tasks.