

# Brain Mapping Center Special Seminar

Hosted By: Marco Iacoboni, MD, PhD, Psychiatry, UCLA

## “Resolution of Ambiguity: Clues to the Mechanisms of Reading”

### Zohar Eviatar, Ph.D.

*Psychology Department; Institute of Information Processing and Decision Making; University of Haifa*

The human race has been reading and writing for only 5,000 years, suggesting that the mechanisms for these processes involve both cultural evolution and biological exaptation. Brain mechanisms of reading are hard to discern because skilled reading is so fast and efficient. Use of ambiguous words allows us to slow down some of these processes and explore the interactions of orthographic, phonological, and semantic processes. We took advantage of the characteristics of Hebrew to explore the relative effects of phonological and semantic ambiguity on access to meaning. Twenty-three participants performed a semantic decision task on pairs of words. Half the pairs were constituted of two unambiguous words, and in half, the first word was either a homophonic homograph (like *bank*), or a heterophonic homograph (like *tear*). Our procedure allowed us to separately examine two stages of the access to meaning: the activation of multiple meanings, and then the selection of the appropriate meaning. Previous imaging studies of ambiguity resolution have not made this distinction. In the first stage, we show that different regions of the left hemisphere respond differentially to homophones and to heterophones in both whole brain analysis and in ROI comparisons of sub-regions of both anterior and posterior regions of the left hemisphere. In the second stage, in meaning selection, we again see different effects that are dependent of the phonological status of the ambiguous word, and also similar effects of the interaction between frequency effects and contextual effects in the two hemispheres. We interpret these findings in the context of a brain model of reading.

## Thursday, September 26, 2013

### 11:00am – 12:00pm

## Brain Mapping Center Conference Room (221)

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For more information contact: Ludmila Budilo ([lbudilo@ucla.edu](mailto:lbudilo@ucla.edu), 310-825-2699)