

Itamar Lerner, Ph.D.

Assistant Professor

Department of Psychology

Research area: Cognitive and Computational Neuroscience

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Bio

I am a cognitive and computational neuroscientist. My research focuses on how the brain encodes, stores, and organizes information in memory. I approach these questions by studying unique learning states (e.g., during sleep, or in patients with psychiatric disorders) to elucidate the general underlying mechanisms involved. My research interests include: The effects of sleep on learning and pattern recognition; hippocampal-dependent memory and its involvement in Post Traumatic Stress Disorder (PTSD); the brain mechanisms behind creativity and insight; associative processes in semantic memory in healthy and schizophrenic individuals; language acquisition; and reinforcement learning in young versus elderly adults.

Degrees

- Ph.D., Brain Sciences: Computation and Information Processing, The Hebrew University of Jerusalem
- B.A., Psychobiology, The Hebrew University of Jerusalem

Research in Progress

- Cognitive and Computational Neuroscience of Memory and Learning
- Sleep and its Effect on Cognition and Emotion
- Semantic Memory and Linguistic Processing

Recent Publications

Journal Publications

- **Lerner, I.**, Gluck, M.A. (2019). Sleep and the Extraction of Hidden Regularities: A Systematic Review and the Importance of Temporal Rules. *Sleep Medicine Reviews*, 47, 39-50.
- **Lerner, I.**, Ketz, N.A., Jones, A.P., Bryant, N.B., Robert, B., Skorheim, S.W., Hartholt, A., Rizzo, A.S., Gluck, M.A., Clark, V.P., Pilly, P.K. (2019). Transcranial Current Stimulation During Sleep Facilitates Insight into Temporal Rules, but does not Consolidate Memories of Individual Sequential Experiences. *Scientific Reports*, 9, 1516. doi: 10.1038/s41598-018-36107-7
- **Lerner, I.** & Gluck, M.A. (2018). Individual Differences in Slow-Wave-Sleep Predict Acquisition of Full Cognitive Maps. *Frontiers in Human Neuroscience* 12, 404 (as part of Research Topic: Learning & Memory). doi:10.3389/fnhum.2018.00404
- Sojitra, R.*, **Lerner, I.** *, Petok, J.R., & Gluck, M.A. (2018). Age Affects Reinforcement Learning Through Dopamine-Based Learning Imbalance and High Decision Noise – Not Through Parkinsonian Mechanisms. *Neurobiology of Aging*. 68, 102-113.
- **Lerner, I.**, Lupkin, S.M., Sinha, N., Tsai, A., & Gluck, M.A. (2017). Baseline Levels of Rapid-eye-Movement Sleep May Protect Against Excessive Activity in Fear-Related Neural Circuits. *Journal of Neuroscience*, 37 (46), 11233-11244.
- **Lerner, I.**, Lupkin, S.M., Corter, J.E., Peters, S.E., Cannella, L., & Gluck, M.A. (2016). The influence of sleep on emotional and cognitive processing is primarily trait- (but not state-) dependent. *Neurobiology of Learning and Memory*. 134, 275-286.
- **Lerner, I.**, Armstrong, B.C., & Frost, R. (2014). What can we learn from learning models about sensitivity to letter-order in visual word recognition? *Journal of Memory and Language*, 77, 4-58.
- **Lerner, I.**, Bentin, S., & Shriki, O. (2014). Integrating the Automatic and the Controlled: Strategies in Semantic Priming in an Attractor Network with Latching Dynamics. *Cognitive Science*, 38(8), 1562-1603.
- **Lerner, I.**, & Shriki, O. (2014). Internally- and externally-driven network transitions as a basis for automatic and strategic processes in semantic priming: theory and experimental validation. *Frontiers in Psychology* 5, 314.
- **Lerner, I.**, Bentin, S., & Shriki, O. (2012). Spreading Activation in an Attractor Network with Latching Dynamics: Automatic Semantic Priming Revisited. *Cognitive Science*, 36 (8), 1339-1382.
- **Lerner, I.**, Bentin, S., & Shriki, O. (2012). Excessive Attractor Instability Accounts for Semantic Priming in Schizophrenia. *PLoS One*, 7 (7): e40663.doi:10.1371/journal.pone.0040663

Book Chapters:

- **Lerner, I.** (2017). Sleep is for the brain: Contemporary computational approaches in the study of sleep and memory and a Novel ‘Temporal Scaffolding’ Hypothesis. In: A. Moustafa (Ed), *Computational Models of Brain and Behavior* (pp. 245-256). Hoboken, NJ: Wiley.