

Itamar Lerner

CURRICULUM VITAE

University of Texas at San Antonio, Department of Psychology

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EDUCATION

The Hebrew University of Jerusalem, Jerusalem, IL

Doctor of Philosophy in Brain Sciences: Computation and Information Processing, 2013

Advisors: Dr. Shlomo Bentin, Dr. Oren Shriki

Thesis: *Semantic Priming in Typical and Schizophrenics Individuals: An Attractor Network Model with Latching Dynamics*

The Hebrew University of Jerusalem, Jerusalem, IL

Bachelor of Science in Psychobiology, 2002

Magna Cum Laude

ACADEMIC APPOINTMENTS

Assistant Professor

January 2020 – Present

University of Texas at San Antonio

Department of Psychology

Research Associate

December 2016 – December 2019

Rutgers University

Center for Molecular and Behavioral Neuroscience

Research Director: Dr. Mark A. Gluck

Postdoctoral Fellow

February 2013 – December 2016

Rutgers University

Center for Molecular and Behavioral Neuroscience

Research Director: Dr. Mark A. Gluck

RESEARCH GRANTS

2021– 2022

SWCOEH (Lerner, PI)

\$19,947

Investigating Objective Measures of Habitual Pre-Trauma Sleep as Potential Risk Factors for Future PTSD

2021	HCaP Jump-Start Seed Grant (Lerner, PI) The Effects of Sleep on the Formation of False Composite Memories	\$4,975
2019 – 2021	NIH/NIMH 1R21MH119020-01A1 (Lerner, Co-PI) Enhancing the Efficiency of Non-REM Sleep Temporal Dynamics to Improve Insight Learning	\$140,302
2015 – 2019	NSF/BCS 1461009 (Lerner, Co-PI) Neurocognitive Studies of Sleep and the Generalization of Emotional Learning and Threat Detection.	\$586,326
2016 – 2018	DoD W911NF-16-C-0018 (Lerner, Co-PI) IMPACTS: Improving Memory Performance by Augmenting Consolidation with Transcranial Stimulation.	\$465,435
2012 – 2016	NSF/SHB:EXP 1231515 * Long-Term Mobile Monitoring and Analysis of Sleep-Cognition Relationship.	\$552,307

* Due to my non-faculty status at Rutgers during submission of this grant, I was not officially listed as PI or Co-PI. However, I was the effective Co-PI with respect to: (1) Co-authoring the proposal, (2) Heading the ongoing research, (3) Authorizing distribution of funds, and (4) dealing with cognizant agency program officers.

AWARDS AND HONORS

2020	Rising STARS award Competitive award for new faculty recruitment at The University of Texas
2010	Israel Foundation Trustees (IFT) Competitive grant for PhD Students.
2010	Robert J. Glushko & Pamela Samuelson Student Travel Grant For quality of submission to the 32nd Annual Conference of the Cognitive Science Society, Portland, Oregon.
2007-2010	Rector's Fellowship For excellence in Ph.D studies, the Hebrew university of Jerusalem.

PUBLICATIONS

REFEREED JOURNAL PUBLICATIONS

Lerner, I., Gluck, M.A. (2022). Sleep Facilitates Extraction of Temporal Regularities With Varying Timescales. *Frontiers in Behavioral Neuroscience*, 16:847803.

doi:10.3389/fnbeh.2022.847083

<https://www.frontiersin.org/articles/10.3389/fnbeh.2022.847083/full>

Lerner, I., Lupkin, S.M., Tsai, A. & Gluck, M.A. (2021). Sleep to Remember, Sleep to Forget: Opposite Effects of Rapid Eye Movement Sleep on Recall and Discrimination of Fear Memories. *Neurobiology of Learning and Memory*, 180, 107413.

<https://www.sciencedirect.com/science/article/abs/pii/S1074742721000356?via%3Dihub>

Pilly, P.K., Skorheim, S.W, Hubbard, R.J., Ketz, N.A., Roach, S.M., **Lerner, I.**, Jones, A.P., Bradley, R., Bryant, N.B., Hartholt, A., Mullins, T.S., Choe, J., Clark, V.P., Howard, M.D. (2020). One-Shot Tagging During Wake and Cueing During Sleep With Spatiotemporal Patterns of Transcranial Electrical Stimulation Can Boost Long-Term Metamemory of Individual Episodes in Humans. *Frontiers in Neuroscience*, 16:1416.

doi:10.3389/fnins.2019.01416

<https://www.frontiersin.org/articles/10.3389/fnins.2019.01416/full>

Lerner, I., Kerbaj, T., & Gluck, M.A. (2019). When Sleep-Dependent Gist Extraction Goes Awry: False Composite Memories are Facilitated by Slow Wave Sleep. In A.K. Goel, C.M. Seifert, & C. Freksa (Eds.), *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (pp. 2119-2124). Montreal, QB: Cognitive Science Society.

<https://mindmodeling.org/cogsci2019/papers/0370/0370.pdf>

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.

<https://doi.org/10.1016/j.smrv.2019.05.00>

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

<https://www.nature.com/articles/s41598-018-36107-7>

Lerner, I., Sojitra, R., Gluck, M.A. (2018). How age affects reinforcement learning. *Aging (Albany NY)*. 10 (12), 3630-3631.

<https://doi.org/10.18632/aging.101649>

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

<https://www.frontiersin.org/articles/10.3389/fnhum.2018.00404/full>

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.
<https://www.sciencedirect.com/science/article/pii/S0197458018301283>

* *Authors contributed equally to this manuscript*

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.

<http://www.jneurosci.org/content/jneuro/37/46/11233.full.pdf>

➤ *Paper chosen for press promotion by the Society for Neuroscience and featured in Time, the Atlantic, Huffington Post, CTV and others. See Selected Media Coverage.*

Lerner, I. (2017). Unsupervised Temporal Learning during Sleep Supports Insight. *Conference on Cognitive Computational Neuroscience (CCN) 2017*. Archived at:

<https://www2.securecms.com/CCNeuro/docs-0/5928daeb68ed3f7a4e8a2571.pdf>

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.

<http://www.sciencedirect.com/science/article/pii/S1074742716301320>

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.

<http://www.sciencedirect.com/science/article/pii/S0749596X14001041>

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.

<http://onlinelibrary.wiley.com/doi/10.1111/cogs.12133/full>

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. doi: 10.3389/fpsyg.2014.00314

<https://www.frontiersin.org/articles/10.3389/fpsyg.2014.00314/full>

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.

<http://onlinelibrary.wiley.com/doi/10.1111/cogs.12007/abstract>

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

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0040663>

Lerner, I., Bentin, S., & Shriki, O. (2010). Automatic and controlled processes in semantic priming: an attractor neural network model with latching dynamics. In S. Ohlsson & R. Catrambone (Eds.) *Proceedings of the 32rd Annual Conference of the Cognitive Science Society*, (pp 1112-1117). Mahwah, NJ: Lawrence Erlbaum.
<https://escholarship.org/uc/item/6b83k8mt>

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.
<https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119159193.ch18>

MANUSCRIPTS IN PREPERATION OR SUBMITTED

Lerner, I., Kerbaj, T, & Gluck, M.A. Slow Wave Sleep Creates False Composite Memories. *In Preparation.*

CONFERENCE PROCEEDINGS

International conferences

Oral presentations

Lerner, I., Lupkin, S.M., Sinha, N., Tsai, A., & Gluck, M.A. *Baseline levels of Rapid-Eye-Movement sleep may protect against excessive fear learning.* The 2018 International Conference on Learning and Memory, Huntington Beach, CA, April, 2018.

Lerner I., Sojitra, R., Petok, J.R., & Gluck, M.A. *Reinforcement learning in healthy aging: Similar behavior to Parkinson's disease, opposite mechanisms?* The 47th Annual Meeting of the Society for Neuroscience (SfN), Washington, DC, November 2017.

Lerner I., Armstrong B., Frost R. *Letter-Position Sensitivity is Modulated by the Linguistic Environment: Evidence From an Elementary Learning Model.* The 54th Annual meeting of the Psychonomic Society, Toronto, Ontario, Canada, November 2013.

Lerner I., Bentin S., Shriki O. *Automatic and controlled processes in semantic priming: an attractor neural network model with latching dynamics.* The 32nd Annual Conference of the Cognitive Science Society. Portland, USA, August, 2010.

Poster presentations

Lerner I., Gluck, M.A. *When Sleep-Dependent Gist Extraction Goes Awry: False Composite Memories are Facilitated by Slow Wave Sleep.* The 41st Annual Conference of the

Cognitive Science Society. Montreal, Canada, July, 2019.

Lerner I. *Unsupervised Temporal Learning During Sleep Supports Insight.* Cognitive Computational Neuroscience (CCN) 2017. New-York, NY, September 2017.

Lupkin, S.M., **Lerner, I.**, Sinha, N., Tsai, A., & Gluck, A.M. *Trait-like variations in rapid-eye-movement sleep modulate hippocampus-amygdala connectivity during fear conditioning.* The 2016 Annual Meeting of the Pavlovian Society, Jersey City, NJ, October 2016.

Sojitra, R., Petok, J.R., Gluck, M.A., & **Lerner, I.** *Reinforcement learning model reveals adult age group differences in cognitive strategies for probabilistic categorization.* The 15th Neural Computation and Psychology Workshop, Philadelphia, PA, August 2016.

Lupkin, S.M., **Lerner, I.**, Tsai A., Gluck M.A. *Sleep Facilitates Rule Learning through "Temporal Scaffolding."* The 2016 Annual Meeting of the Cognitive Neuroscience Society (CNS), New York, NY, April 2016.

Lerner, I., Peters, S.E., Lupkin S.M., Cannella, L., Gluck, M.A. *Trait-like individual differences in sleep affect cognitive and emotional processing.* The 29th Annual Meeting of the Associated Professional Sleep Societies (APSS), Seattle, WA, June 2015.

Lerner, I., Lupkin S.M., Peters, S.E., Cannella, L., Gluck, M.A. *Consumer-based mobile sleep monitoring devices reveal trait-like effects of sleep on the evaluation of facial expressions in a multiple-night study.* The 2015 Annual Convention of the Association for Psychological Science (APS), New York, NY, May 2015.

Lerner, I., & Gluck, M.A. *A neurocomputational model of how memory replay during slow-wave sleep inspires insight.* The 44th Annual Meeting of the Society for Neuroscience (SfN), Washington, DC, November 2014.

Canella, L., **Lerner, I.**, Ohloma, D., & Gluck, M.A. *Sleep Inspires Temporal Insight but not Categorical Insight.* The 44th Annual Meeting of the Society for Neuroscience (SfN), Washington, DC, November 2014.

Lerner, I., & Gluck, M.A. (2014). *Sleep facilitates memory by providing 'temporal scaffolding' of experience: A network model.* The 28th Annual Meeting of the Associated Professional Sleep Societies (APSS), Minneapolis, MN, June 2014.

Other presentations

Lerner I., Sojitra, R., Petok, J.R., & Gluck, M.A. *Reinforcement learning in healthy aging: Similar behavior to Parkinson's disease, opposite mechanisms?* Oral Presentation at the Neuroscience Mini-Symposium at the Center for Molecular and Behavioral Neuroscience, Rutgers University. Newark, NJ, November 2017.

Lerner I. *Semantic priming in Schizophrenia: An attractor network model with attractor instability.* Oral Presentation at the Annual meeting of the Interdisciplinary Center for Neural Computation. Ein-Gedi, Israel, January 2011.

Lerner I. *Automatic and Controlled Processes in Semantic Priming: An Attractor Neural Network Model.* Oral Presentation at the weekly colloquium of the Psychology department at the Hebrew University. Jerusalem, Israel, December 2009.

Lerner I., Bentin S., Shriki O. *Aberrant Semantic Priming in Schizophrenia: A network model with accelerated latching dynamics.* Poster presented at the Annual meeting of the Interdisciplinary Center for Neural Computation. Ein-Gedi, Israel, January 2009.

INVITED LECTURES

Effects of sleep on insight learning is explained by a 'temporal scaffolding' mechanism based on compressed memory-replay. Park City Conference on the Neurobiology of Learning and Memory, Park City, UT, January 2017.

Novel Approaches to Study Long-Term Sleep Effects and Sleep-Dependent Insight Learning. DARPA Sleep Workshop, Arlington, VA, April 2015.

TEACHING EXPERIENCE

COURSES TAUGHT

University of Texas at San Antonio, San-antonio, TX
Lecturer, "Cognitive Psychology" undergraduate course. January 2020 – present.

Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark ,NJ
Lecturer, "Foundations in Neuroscience" graduate course, April 2018.

Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark ,NJ
Guest Lecturer. "Critical Thinking" graduate course, March 2016.

Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark ,NJ
Lecturer. "Learning and Memory" graduate course, May 2013.

Center for Brain Sciences (ELSC), The Hebrew University of Jerusalem, Jerusalem, IL
Lecturer, "Cognitive Psychology" graduate course. October 2009 – June 2012.

Center for Brain Sciences (ELSC), The Hebrew University of Jerusalem, Jerusalem, IL
Teaching Assistant. "Computation and Cognition" undergraduate course. October 2005 – September 2009.

Department of Cognitive Sciences, The Hebrew University of Jerusalem, Jerusalem, IL
Lecturer, “Introduction to Matlab” undergraduate course. November 2005.

Center for Brain Sciences (ELSC), The Hebrew University of Jerusalem, Jerusalem, IL
Teaching Assistant, “Theory of Neural Networks 2” graduate course. October 2004 - June 2006.

MENTORING

Undergraduate

Adeel Ahmed (2021 –)
 Alexis Gutz (2021 –)
 Raymond Nwobodo (2021 –)
 Emily Wood (2020 –)
 Ijeoma Okoko (2020 –)
 Saharsh Patel (2019)
 Kerbaj Tony (2016 – 2019)
 Alan Tsai (2015 – 2019)
 Donald Ohiona (2013 – 2014)

Graduate and Post-Baccalaureate

James Westphal (2021 –)
 Sarah Hamm (2020 –)
 Emerson Larios (2020 –)
 Anosha Khawaja (2017-2018)
 Shira Lupkin (2014 – 2017)
 Lee Anne Cannella (2013 – 2014).
Thesis: Individual trait-like differences in long-term sleep patterns modulate emotional and cognitive processing

SELECTED MEDIA COVERAGE

CTV. A Better Sleep Can Tame Your Fears. *Live TV interview.*
<http://www.ctvnews.ca/video?playlistId=1.3646566>

Time. Why Dreaming May Be Important for Your Health.
<http://time.com/4970767/rem-sleep-dreams-health/>

The Atlantic. Better Sleep Can Build Emotional Resilience.
<https://www.theatlantic.com/health/archive/2017/10/rem-and-trauma/543573/>

Newsweek. Getting a Full Night’s Rest Means You’re Probably More Resilient Than Everyone Else.
<http://www.newsweek.com/getting-full-nights-rest-means-youre-probably-more-resilient-everyone-else-690701>.

Huffington Post. The Sleep Phase Where You Dream May Make You Less Prone to Fear.
https://www.huffingtonpost.com/entry/rem-sleep-fear_us_59f749fce4b077d8dfcb3ea1

Daily Mail. Poor Sleep Makes You Fearful – and Can Increase a Soldier’s risk of PTSD.
<http://www.dailymail.co.uk/health/article-5009483/Poor-sleep-makes-FEARFUL-increase-risk-PTSD.html>

The Naked Scientists. Sleep Reduces Fear Learning Activity in the Brain. *Podcast Interview.*

<https://www.thenakedscientists.com/articles/science-news/sleep-reduces-fear-learning-activity-brain>

ADDITIONAL PROFESSIONAL EXPERIENCE

Research-Related

ConicIT Ltd: Petah-Tikva, IL.
Research Consultant. 2011- 2012.

Advanced Course in Computational Neuroscience (ACCN), Freiburg, Germany
Summer-school for graduate students, August, 2008.

Department of Psychiatry, Columbia University, New York, NY (work done mostly from Israel).
Research assistant (under Dr. Bruce Dohrenwend). January 2003 - August 2004.

The Institute of Life Sciences, The Hebrew University of Jerusalem, Jerusalem, IL
Research assistant (under Dr. Ariel Darvasi). March 2002 - January 2003.

Department of Psychology, The Hebrew University of Jerusalem, Jerusalem, IL
Research assistant (under Dr. Yehuda Shavit). October 2001 - July 2002.

Falk Institute for Mental Health and Behavioral Studies, Jerusalem, IL.
Research assistant, 2001 -2002.

Military Service

Nuclear Research Center - Negev: 1997-1999.

Preparation course in nuclear physics and radiation: 1996.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Society for Neuroscience

The Cognitive Science Society

Sleep Research Society

AD HOC REVIEWER

Cell Reports

Cognitive Neurodynamics

Journal of Cognitive Psychology

Journal of Computational Neuroscience

Journal of Experimental Psychology - General

Frontiers in Human Neuroscience

Frontiers in Neuroscience

Memory and Cognition

Nature and Science of Sleep

Neurobiology of Learning and Memory

PLoS Biology

PLoS One

Proceedings of the National Academy of Science

Psychological Review

Scientific Studies of Reading

Sleep

The 33rd Annual Conference of the Cognitive Science Society (CogSci 2011)

The Journal of Experimental Analysis of Behavior