

CURRICULUM VITAE

SARA C. MEDNICK, PHD

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Education

1990-1994 B.A. Drama/Dance, Bard College, Annandale-on-Hudson, NY
1992-1993 B.A. Year Abroad, Charles University, Prague, Czech Republic
1997-2003 Ph.D. Psychology, Harvard University, Cambridge, MA.
Advisors: Ken Nakayama and Robert Stickgold
2003-2006 Post Doc, Salk Institute for Biological Studies
Advisors: Geoffrey Boynton and Sean P.A. Drummond

Positions and Employment

1996-1997 Research Assistant, James C.Y. Chou, MD, Department of Psychiatry, New York University, Bellevue Hospital, NY
1996-1997 Internship, Mark Serper, MD, New York University Bellevue Hospital, NY,
1996-1997 Internship, Cynthia Green, MD Mt Sinai Hospital, NY
1998-1999 Research Assistant, Phil Holzman, MD, Department of Psychology, Harvard University, Mclean Hospital, Belmont, MA,
2003-2006 Research Fellow: The Salk Institute for Biological Studies, Systems Neurobiology Lab, (Geoffrey M. Boynton, PhD: mentor), University of California San Diego and Veterans Affairs San Diego Health Care System, The Laboratory for Sleep and Behavioral Neuroscience (Sean P.A. Drummond, PhD: mentor)
2007-2011 Assistant Project Scientist, Department of Psychiatry, UCSD
2011-2016 Assistant Professor, Department of Psychology, UC Riverside
2016-2017 Associate Professor, Department of Psychology, UC Riverside
2017 Associate Professor, Department of Psychology, UC Irvine

Fellowships, Honors and Awards

2015 Department of Defense, Young Investigator Prize
2013 University of Sydney, Visiting Scholar Award
2012-13 University of California, Riverside Academic Senate Regents Award
2008-9 University of California, San Diego Academic Senate Award
2007-12 National Institutes of Mental Health, K01 Career Development Award (NIMH-K01MH080992)
2008 Invited speakers at National Academy of Sciences, Irvine CA
2007 Invited Speaker to Oasis
2006 Defense Advanced Research Projects Agency (DARPA) Award
2006 APSS conference abstract excellence award
2005 APSS conference travel award
2004 Society for Research Fellows Speaker Award 2004, Salk Institute for Biological Studies La Jolla, CA
2003-7 National Institutes of Mental Health, Ruth L Kirschstein National Research Service Award (NEI)

Professional Society Memberships

2000 Society for Neuroscience

2000 Vision Sciences Society
2003 Sleep Research Society
2011 Center for Circadian Biology

Research Support Ongoing

2014-2019 NIA R01AG046646 Principal Investigator: Mednick
(\$1,250,000)

The critical role of sleep spindles in memory consolidation.

The central aim of this application is to use pharmacological intervention to address the specificity of sleep-dependent memory with respect to 1) sleep feature (i.e., sleep spindles vs. other sleep features), 2) memory domain (i.e. declarative vs. non-declarative), and 3) pharmacological agents (i.e., zolpidem (GABAa) vs. sodium oxybate (GABAb) vs. placebo). Establishing a link between correlational sleep studies and pharmacological interventions that target precise memory domains will allow us to determine the sleep features that are critical for memory consolidation. With this knowledge, we will adapt this pharmacological approach for testing in older adults. We will investigate the hypothesis that pharmacologically boosting sleep spindles in older adults will improve declarative memory, compared with non-declarative memory and placebo.

2018-2023 R01 AG061355 (PIs: Baker & Mednick), 12/01/2018 – 11/30/2019
(\$1,250,000)

The Impact of Sex Hormones on Sleep-Dependent Memory in Young and Midlife Men and Women

The major goals of this project are to determine lifespan developmental mechanisms of sex and sex hormone impact on memory in young and midlife women and men. We will also utilize a novel memory-boosting intervention during sleep (targeted memory reactivation) to further understand the potential protective role of sleep against cognitive decline, as well as introduce a novel potential non-invasive treatment for age-related memory impairment.

Completed

2015-2018 DoD Young Investigator Prize
(\$375,526)

Heart rate variability during daytime naps as a predictor of memory consolidation in healthy, well-rested adults.

We propose to investigate the role of autonomic function in memory consolidation by examining how the fluctuations in cardiovascular output during sleep are related to sleep-dependent memory consolidation. We will specifically examine this question in the framework of daytime sleep (i.e., naps) that: 1) are used by many to supplement nighttime sleep, 2) show the same cognitive benefits as nighttime sleep (Mednick, Nakayama et al. 2003), and 3) have strong translational significance. Surprisingly little is known about cardiovascular output during naps. Given the importance of sleep for memory consolidation, and autonomic function for sleep and cognition, our findings may provide a unifying connection between autonomic function, sleep, and memory consolidation. The goal of the current proposal is to thoroughly investigate this HRV phenomenon as a bioassay for memory consolidation during sleep, which would be a less expensive and easier alternative than the current gold standard of in-lab polysomnography (PSG).

2013-2018 ONR (MURI) N000141310672 Principal Investigator: Bazhenov (Mednick: consultant)
(\$7.5 million)

Memory Consolidation During Sleep in Humans, Rodents and Computational Models

The goal of this project is to develop large-scale computer models of thalamo-cortico-hippocampal system to explain the role of sleep rhythms in memory consolidation based on animal and human data.

2014-2017 Principal Investigator: Mednick, Co-I: Michael Silver (UC Berkeley)
NSF Cognitive Neuroscience BCS1439210
(\$315,350 over three years)

Cholinergic and sleep regulation of human memory and learning

This project started September 2014. **Intellectual Merit:** The objective of this award is to systematically and experimentally modulate a single neurotransmitter that is known for its importance in memory and learning (i.e., acetylcholine). This neurotransmitter will be modulated across the four stages of memory processing:

encoding, waking consolidation, sleep consolidation, and retrieval. We will use an acetylcholinesterase inhibitor that enhances function only at cholinergic synapses that are releasing acetylcholine during a particular cognitive process. The role of cholinergic processing will be examined during the four stages of declarative and non-declarative memory processing. **Broader Impacts:** Information from these findings can be used to enhance basic memory or impaired memory. We will also train many undergraduate and graduate students, including females and minority students at UCR.

2015-2017 DARPA Principal Investigator: Teledyne Scientific and Imaging; Stephen Simons (Mednick: Subcontract Performer) (\$10,000,000)

Targeted Stimulation for Enhancing Replay (TASER)

A 24-month program to develop model-based interventions that use sensory cueing and memory-type specific localization of transcranial alternating current stimulation (tACS) to enhance sleep spindles and improve replay. The project focuses on three primary areas: 1) human task performance, 2) quantification of memory replay and 3) interventions, and the challenges associated with advancing them to reach our proposed solution.

2014-2017 DoD N00014-14-1-0513 Principal Investigator: Mednick (\$995,381)

The effect of psychostimulants and zolpidem on sleep and cognitive performance.

The goal of these studies is to develop a pharmacological intervention to enhance cognitive processes that are vulnerable to fatigue, including learning and memory, sustained attention and response control, attentional tracking, and emotional processing. The completion of these studies will lead to better understanding of the impact of psychostimulants (“smart pills”) and sleep drugs on cognition and sleep in healthy young adults. This knowledge can be used to help treatment strategies and to understand interactions of these drugs with normal functioning and enhanced cognition. These studies will also address the growing trend in college students to use these so-called “smart pills” for cognitive enhancement, a trend that has received little experimental attention.

2012-2013 Principal Investigator: UC Riverside Academic Senate Regents Award (\$13,000/year 2012-2013)

Investigating the role of anterograde amnesia in memory consolidation.

This award will allow the Mednick lab to expand on findings from the K01 in which we showed that that zolpidem augmented sleep spindles and promoted verbal memory greater than sleep alone. One aspect of zolpidem is post-administration, anterograde amnesia. The current study will examine the relationship between exceptional verbal memory and amnesia.

2007-2012 Principal Investigator: K01 Career Development Award (K01MH080992 – 01)

Understanding memory consolidation by studying pharmacologically enhanced naps

The Career award enabled me to add pharmacological mechanisms to my set of tools for exploring sleep-dependent memory consolidation. The goal of this grant is to understand the pharmacological basis for sleep-dependent memory consolidation. Over five years, I will be running three studies, 1) a dose response nap study, 2) a nap study with two optimal doses of drugs that enhance SWS and stage two sleep, examining the effect of pharmacologically enhanced naps on three different memory domains, and 3) an fMRI study examining the brain mechanisms of pharmacological manipulation of sleep stages on memory consolidation.

2007-2012 Jazz Pharmaceuticals Investigator initiated study
This grant supported my K01 with sodium oxybate and placebo

2006 – 2007 Defense Advanced Research Projects Agency (DARPA)

Comparing the effects of Modafinil, Napping and Caffeine on perceptual learning and deterioration.

This study compared common fatigue countermeasures, placebo and sleep on three different forms of memory: perception, motor, and verbal declarative. We found discrete enhancements and decreases in performance in the drug and sleep conditions, which suggests that different underlying mechanisms support these different memory domains.

2008-2009 UCSD Academic Senate Award

The effects of illumination on nap architecture

The goal of this study is to examine whether daytime sleep is affected by light using light emitting goggles of across a wide range of intensities. We found the unlike nighttime sleep, illumination does not interfere with sleep onset or sleep architecture in a daytime nap.

Expert Witness Testimony

Johnson & Klein, PLLC

Publications (h-index: 23, total citations: 3523)

Peer-reviewed Journal Articles

- 1) **Mednick SC**, Nakayama K, Cantero JL, Atienza M, Levin AA, Pathak N, Stickgold R, "The Restorative Benefit of Naps on Perceptual Deterioration," *Nature Neuroscience*, July 2002.
- 2) **Mednick SC.**, Nakayama K., Stickgold R. "Sleep-dependent Learning: A Nap is as Good as a Night," *Nature Neuroscience*, July 2003.
- 3) **Mednick SC**, Drummond SPA, "Sleep: A Prescription for Insight?" *INSOM*, Summer 2004, Issue 3, 26-29.
- 4) Schiffman J, Pestle S, **Mednick SC**, Eckstrom M, Sorenson H, Mednick SA, "Childhood laterality and adult schizophrenia spectrum disorders: A prospective study." *Schizophrenia Research* 2005 Jan 1;72(2-3):151-60.
- 5) **Mednick SC**, Arman AC, Boynton GM, "The time course and specificity of perceptual deterioration" *Proceedings from the National Academy of Sciences USA* 2005 Mar 8;102(10):3881-5. Epub 2005 Feb 24.
- 6) Drummond SP, Bischoff-Grethe A, Dinges DF, Ayalon L, **Mednick SC**, Meloy MJ. The neural basis of the psychomotor vigilance task. *Sleep*. 2005 Sep 1;28(9):1059-68.
- 7) **Mednick SC**, Drummond SPA, Boynton GM, Awh E, Serences J, Sleep-Dependent Learning and Practice-Dependent Deterioration on an Orientation Discrimination Task, *Behavioral Neuroscience*, 2008, Vol. 122, No. 2, 267–272.
- 8) **Mednick SC**, Drummond SPA, Arman AC, Boynton GM, Perceptual Deterioration is reflected in the neural response: an fMRI study between nappers and non-nappers. *Perception*, 2008, volume 37, pages 1086-1097.
- 9) **Mednick SC**, Kanady J, Cai D, Drummond SPA, Comparing the benefits of Caffeine, Naps and Placebo on Verbal, Motor, and Perceptual Memory. *Behavioral Brain Research*, 193 (2008) 79–86.
- 10) **Mednick SC**, Makovski T, Cai D, Jiang Y, Nap-dependent implicit spatial learning in contextual cueing. 2009, *Vision Research* (2009) April 18.
- 11) Cai D, Mednick SA, Kanady J, Drummond SPA, **Mednick SC**, Priming Associative Networks: REM, Not Incubation, Improves Creativity. *Proceedings from the National Academy of Sciences USA* June (2009).
- 12) **Mednick SC**, Christakis NA, Fowler JH The Spread of Sleep Loss Influences Drug Use in Adolescent Social Networks. *PLoS ONE* 5: e9775 (2010).
- 13) Kanady J, Drummond SPA, **Mednick SC**, The Influence of Prior Sleep (Actigraphy) on Sleep Stages (PSG) During a Nap in Healthy Well-Rested Adults. *Journal of Sleep Research*, 2010 May 3; 103(2):197-202.
- 14) **Mednick SC** and Alaynick WA, Comparing models of sleep-dependent memory consolidation, *Journal of Experimental and Clinical Medicine*, 2010; 2(4):156-164.
- 15) Reith C, Cai D, McDevitt EA **Mednick SC**, "The role of sleep and practice on explicit and implicit motor memory consolidation." *Behavioral Brain Research*, 2010.
- 16) Harrison L., Gorman M. and **Mednick SC**. The Influence of Light on Sleep Quality and Architecture during Daytime Sleep. *Physiology and Behavior*, 2011 May 3; 103(2):197-202.
- 17) **Mednick SC**, Cai D, Anagnostaros S, Shuman T, Wixted J, An Opportunistic Theory of Cellular and Systems Consolidation. *Trends in Neuroscience* Oct 2012;34(10):504-514.
- 18) Gupta N, Jung Y, **Mednick SC**, and Huber D, The road not taken: Creative solutions require avoidance of high frequency responses. *Psychological Science* 2012 Mar;23(3):288-94.

- 19) McDevitt EA, Alaynick, W, and **Mednick SC**, The effect of nap frequency on daytime sleep architecture. *Physiol Behav.* 2012 May 31;107(1):40-44.
- 20) **Mednick SC**, Walsh J, Wamsley E, Paulus M, Kanady JC, McDevitt EA, Drummond SPA. The critical role of sleep spindles in hippocampal-dependent memory: a pharmacology study. *Journal of Neuroscience* 2013 Mar 6; 33(10): 4494-504.
- 21) Kaestner E., Wixted J., **Mednick SC.**, Pharmacologically Increasing Sleep Spindles Enhances Recognition for Negative and High-Arousal Memories. *Journal of Cognitive Neuroscience*, 2013; 25(10): 1579.
- 22) Brakefield, T, **Mednick SC**, Christakis NA, Fowler JH, Sexual orientation does not spread through adolescent social networks. *Archives of Sexuality* 2013 Jul 11.
- 23) Cellini MS., Buman MP, McDevitt EA., Ricker A., Rowe K., Duggan K., **Mednick SC.**, Direct comparison of two actigraphy devices with polysomnographically-recorded naps in healthy young adults. *Chronobiology International* 2013 Jun; 30(5):691-8.
- 24) Feupe SF, Frias PF, **Mednick SC**, McDevitt EA, Heintzman ND, Analysis of nocturnal continuous glucose and sleep stage data in adults with type 1 diabetes in real-world conditions. *Journal of Diabetes Science and Technology* 2013 Sept, 7(5) 1337-1345.
- 25) Cellini N, McDevitt EA, Ricker AA, Rowe KM, Mednick SC, Validation of an automated wireless system for sleep monitoring during daytime naps. *Behavioral Sleep Medicine* 2014 Feb 24
- 26) **Mednick SC**, Napping helps preschoolers learn. *PNAS invited commentary* 2013.
- 27) McDevitt, EA, Rokem, A, Silver, M, **Mednick SC**, Sex differences in sleep-dependent perceptual learning. *Vision Research, Special Issue on Perceptual Learning* 2013 Jun;99:172-9
- 28) McDevitt, EA, Rowe K., Brady M, **Mednick SC**, The benefit of offline sleep and wake for novel object recognition. *Experimental Brain Research* 2014 May;232(5): 1487-96
- 29) Duggan K., McDevitt EA, Rowe K., Friedman H., **Mednick SC.**, Personality and Healthy Sleep: The Importance of Conscientiousness and Neuroticism, *PlosOne* 2014 Mar 20;9(3)
- 30) McDevitt EA, Duggan K, **Mednick SC**, REM sleep rescues learning from interference. *Neurobiology of Memory and Learning*, 2015 Jul; 122:51-62.
- 31) Kastellkis G, Cai DJ, **Mednick SC**, Silva AJ, Poirazi P, Dendritic Mechanisms that shape memory in neuronal circuits, *Progress in Neurobiology*, 2015, Mar; 126:19-35.
- 32) Cellini N, Goodbourn PT, McDevitt EA, Holcombe AO, Martini P, **Mednick SC**, The role of sleep in the modulation of temporal attention, *Attention, Perception and Psychophysics* *Attention Perception Psychophysics*, 2015 Aug; 77(6):1945-54.
- 33) Duggan, K. A., Friedman, H. S., McDevitt, E. A., & **Mednick, SC** (2014). Personality and healthy sleep: The importance of conscientiousness and neuroticism. *PLOS ONE*, 9(3), e90628.
- 34) Cellini N, Whitehurst, LN, McDevitt EA, **Mednick, SC**, (2015). Heart rate variability during daytime naps in healthy adults: Autonomic profile and short-term reliability. *Psychophysiology*. (in press)
- 35) Niknazar M, Krishnan GP, Bazhenov M, **Mednick SC**, (2015). Coupling of Thalamocortical Sleep Oscillations Are Important for Memory Consolidation in Humans. *PLoS One*. 10(12). e0144720.
- 36) Yetton BD, Niknazar M, Duggan KA, McDevitt EA, Whitehurst LN, Sattari N, **Mednick SC**, (2015). Automatic detection of rapid eye movements (REMs): A machine learning approach. *J Neurosci Methods*. Volume 259, 1 February 2016, Pages 72–82.
- 37) Cellini N, McDevitt ES, **Mednick SC**, Buman M, Free-living Cross-Validation of Two Wearable Monitors for Physical Activity and Sleep in Healthy Young Adults. *Physiol Behav.* 2016 Apr 1;157:79-86.
- 38) Duggan K., McDevitt EA, Whitehurst LN, To Nap, Perchance to DREAM: A Factor Analysis of College Students' Self-Reported Reasons for Napping (2016) *Behavioral Sleep Medicine* 27 Jun.
- 39) Whitehurst LN, Cellini N, McDevitt EA, **Mednick SC**, Autonomic activity during sleep predicts memory consolidation in humans. (2016) *Proceedings from the National Academy of Sciences USA*, vol 113 no 26, 7272-7277.
- 40) Obradovich N., Migliorni R., **Mednick SC**, Fowler JH, Nighttime temperature and human sleep loss in a changing climate. *Science Advances* (2017) May 26;3(5):e1601555.
- 41) Schapiro A, McDevitt EA, L Chen, Norman K, **Mednick SC**, and Rogers T, Sleep Benefits Memory for Semantic Category Structure While Preserving Exemplar-Specific Information, *Sci Rep.* 2017 Nov 1;7(1):14869. doi: 10.1038/s41598-017-12884-5.
- 42) Sattari N*, McDevitt EA*, Panas D, Niknazar M, Ahmadi M, Naji M, Baker F, **Mednick SC**, The Effect of Sex and Menstrual Phase on Memory Formation during Nap. *Neurobiol Learn Mem.* 2017 Nov;145:119-128. doi: 10.1016/j.nlm.2017.09.007.

- 43) Ahmadi M, McDevitt LA, Silver MA, **Mednick SC**, Perceptual learning induces changes in early and late visual evoked potentials. *Vision Res.* 2017 Dec 22. pii: S0042-6989(17)30229-8. doi: 10.1016/j.visres.2017.08.008.
- 44) Shimizu R, Connolly P, Cellini N, Armstrong D, Hernandez L, Estrada R, Aguilar M, Weisend M, **Mednick SC**, and Simons S, Closed-loop targeted memory reactivation during sleep improves spatial navigation *Frontiers Human Neuroscience* 12, 28 (2018)
- 45) Thurman SM, Wasylyshyn N, Roy H, Lieberman G, Garcia JO, Asturias A, Okafor GN, Elliott JC, Giesbrecht B, Grafton ST, **Mednick SC**, Vettel JN. Individual differences in compliance and agreement for sleep logs and wrist actigraphy: A longitudinal study of naturalistic sleep in healthy adults. *PlosOne* 13, 1 (2018)
- 46) Whitehurst LN, Naji M, **Mednick SC**, Comparing the cardiac autonomic activity profile of daytime naps and nighttime sleep. *Neurobiology of Sleep and Circadian Rhythms* 5, 52-57 (2018)
- 47) Yetton BD, McDevitt EA, Cellini N, Shelton C, **Mednick SC** (2018) Quantifying sleep architecture dynamics and individual differences using big data and Bayesian networks. *PLoS ONE* 13(4): e0194604. <https://doi.org/10.1371/journal.pone.0194604>
- 48) Baker FC, Sattari N, de Zambotti M, Goldstone A, Alaynick W, **Mednick SC**, Impact of sex steroids and reproductive stage on sleep-dependent memory consolidation in women. *Neurobiology of Learning and Memory* Volume 160, April 2019, Pages 118-131 (2018)
- 49) Schapiro A, McDevitt EA, Rogers T, **Mednick SC**, and Norman K, Human hippocampal replay during rest prioritizes weakly-learned information and predicts memory performance" *Nature communications* 9 (1), 3920 (2018)
- 50) Malerba P., Whitehurst L, Simons S., **Mednick SC** Spatio-temporal structure of sleep slow oscillations on the electrode manifold and its relation to spindles *SLEEP* 42. 1 (2018).
- 51) McDevitt EA, Sattari N, Duggan KA, Cellini N, Whitehurst LN, Perera C, Reihanabad N, Granados S, **Mednick SC**, McDevitt EA, Sattari N, Duggan KA, Cellini N, Whitehurst LN, Perera C, Reihanabad N, Granados S, Mednick SC, Does nap practice improve the memory benefits of napping? *Scientific Reports* *Scientific reports* 8 (1), 15053 (2018).
- 52) Cellini N, **Mednick SC**, Stimulating the sleeping brain: Current approaches to modulating memory-related sleep physiology. *Journal of Neuroscience Methods* *Journal of neuroscience methods* 316, 125-136.
- 53) Naji M, Krishnan G, McDevitt LM, Bazhenov M, **Mednick SC**. Coupling of autonomic and central events during sleep benefits declarative memory consolidation. *Neurobio Learn Mem.* 157 (2019) 139-150.
- 54) Sattari N, Whitehurst LN, Ahmadi M, **Mednick SC**, Does working memory improvement benefit from sleep in older adults? *Neurobiology of Sleep and Circadian Rhythms* 6, 53-61 (2019)
- 55) Naji M, Krishnan G, Bazhenov M, **Mednick SC**. Timing between cortical slow oscillations and heart rate bursts during sleep predicts perceptual speed, but not offline consolidation. *Journal of Cognitive Neuroscience* (in press)
- 56) Cellini N, Shimizu RE, Connolly PM, Armstrong DM, Hernandez LT, Polakiewicz AG, Estrada R, Aguilar-Simon M, Weisend M, **Mednick SC**, Simons S, Short duration repetitive transcranial electrical stimulation during sleep enhances declarative memory of facts. *Frontiers in Human Neuroscience* 13 pg 123 (2019)

Under Review

- 57) Whitehurst LN, **Mednick SC**, The controversial relationship between psychostimulants and cognitive enhancement: Is sleep the missing link?
- 58) Liu J, **Mednick SC**, Frequent and long naps benefit schoolchildren's academic performance, emotion/behavior, and psychological wellbeing: a large epidemiology study

Chapters

- 1) **Mednick SC**, Drummond SPA, "Sleep Function: Napping" in *The New Encyclopedia of Neuroscience* eds. Squire L, Albright T, Elsevier London, 2006.
- 2) **Mednick SC**, "Sleep and Dreams" in *Encyclopedia of Perception* E. Bruce Goldstein, Editor, Sage Publications, 2009.
- 3) **Mednick SC**, Naps, *Encyclopedia of Sleep*, Clete Kushida Editor, Elsevier, 2010

- 4) McDevitt EA, Krishnan, Bazhenov, **Mednick SC**, The role of sleep spindles in sleep-dependent memory consolidation. *Cognitive Neuroscience of Memory Consolidation*, Edited by Axmacher & Rasch, Springer 2016

Books

Take a Nap! Change Your Life. Workman Publishers, December 2006

Online Courses

[How to Sleep Better](#) by Life Reimagined
[Give it up for the down state](#). TedxUCR

Review Contributions

Grants

2004 Reviewer for Austrian Science Fund
2004 Reviewer for Israeli Science Foundation
2008 National Science Foundation
2013 NIH: Study Section Reviewer: Multisensory processing
2014 Netherlands Organization for Scientific Research
2015 Swiss National Science Foundation
2015 National Science Foundation panel member
2015-16 National Science Foundation: Major Research Instrumentation Panel

Journals

Proceedings from the National Academy of Science, Sleep Journal, Psychological Science, Vision Research, Journal of Vision, Journal of Sleep Research, PLoSOne, Journal of Neuroscience, Neuroscience Research, Frontiers of Neuroscience, Child Development, Nature

Graduate Students

Elizabeth McDevitt (5th year): awarded NSF predoctoral fellowship, National Defense Science & Engineering Graduate Fellowship (Declined), UCR Graduate Research Mentorship Program, UCR graduate researcher, and the departmental graduate student of the year award

Ben Yetton (3rd year): awarded NSF predoctoral fellowship

Lauren Whitehurst (4th year)

Katherine Duggan PhD: NSF predoctoral fellowship honorable mention

Negin Sattari (2nd year)

Undergraduate Students:

I have mentored over 100 undergraduate students, with multiple NSF scholarships, and multiple scientific presentations at undergraduate and professional international scientific conferences

Postdoctoral Fellows

Paola Malerba

Maryam Ahmadi Shapourabadi

Mohammad Niknazar

Mohsen Naji

Dagmara Panas

Nicola Cellini

UCR Committees:

Neuroscience Search Committee member, 2014 and 2013, Cognitive Search Committee member 2012, UCR fMRI task force, UCR Grant Writing Mentor

Teaching Experience

Undergraduate	Graduate
Introduction to Psychology Psychopharmacology The Role of Sleep in Memory Advanced biology of sleep oscillations (lecturer) Physiological Psychology (lecturer) Vision and the Brain Consolidation The Role of Sleep in Memory	Adaptation: What is it good for? Psychopharmacology Consolidation The Role of Sleep in Memory

Abstracts

- 1) "The Emotional Stroop and Schizophrenia, comparing positive and negative symptoms," Society for Research in Psychopathology, Atlanta, GA, 1997.
- 2) "Schizophrenia, Laterality, and the Anti-saccade Task," Society for Research in Psychopathology, Palm Springs, CA, 1998.
- 3) "Sustained Fixation as a Measure of Vigilance in Schizophrenia," International Congress on Schizophrenia Research, Santa Fe, New Mexico, 1999.
- 4) "Rapid Learning and Unlearning of Context in Priming of Pop-out," Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida, 2000.
- 5) "Implicit Memory for Spatial-context in Schizophrenic Patients," Society for Neuroscience, New Orleans, LA, 2000.
- 6) "From Features to Spatial Maps: Implicit Memory Investigated in Schizophrenia," International Congress on Schizophrenia Research, Whistler, British Columbia, Canada, 2001.
- 7) "From Features to Spatial Maps: Implicit Memory Investigated in Schizophrenia," International Congress on Schizophrenia Research, Whistler, British Columbia, Canada, 2001.
- 8) "Benefit of Nap is Retinotopically Specific," Vision Sciences Society, Sarasota, FLA., 2001.
- 9) "Restorative Effect of Naps on Perceptual Deterioration," Society for Neuroscience, San Diego, CA., 2001.
- 10) "Perceptual Deterioration Predicts Performance Today," Vision Sciences Society, Sarasota, FLA., 2002.
- 11) "Perceptual Learning After a Nap: The Mini-Me of Sleep," Vision Sciences Society, Sarasota, FLA., 2003.
- 12) "Sleep-dependent Learning: A Nap is as Good as a Night," American Professional Sleep Society, Chicago, Ill., 2003.
- 13) "Perceptual Deterioration is Specific to Target Orientation," Vision Sciences Society, Sarasota, FLA., 2004.
- 14) "The time course and specificity of perceptual deterioration" Society for Neuroscience, San Diego, CA 2004
- 15) "The neural correlates of sleep-dependent perceptual learning and deterioration: a role for attention?" Vision Sciences Society, 2005, Sarasota, FLA,
- 16) The neural correlates of sleep-dependent perceptual learning and deterioration: a role for attention? Associated Professional Sleep Societies in Denver, CO 2005. (published in Sleep 2005 28(Suppl 1):A345).
- 17) "The Neural Basis of the Psychomotor Vigilance Task", SPA Drummond, A Bischoff-Grethe, DF Dinges, L Ayalon, SC Mednick, MJ Meloy. SLEEP, Vol.28, No.9, pp.1059-1068, 2005.
- 18) "Naps are Better Than Caffeine for Improving Performance" Vision Sciences Society, 2006, Sarasota, FLA,
- 19) "Comparing Naps, Caffeine, Modafinil and Placebo on a Variety of Memory Tasks." APSS, 2006.
- 20) "Sleep-Dependent Learning and Practice-Dependent Deterioration on an Orientation Discrimination Task." VSS, 2007.

- 21) Kanady J, Drummond SPA, Mednick SC, The Influence of Prior Sleep (Actigraphy) on Sleep Stages (PSG) During a Nap in Healthy Well-Rested Adults APSS, 2008.
- 22) Mednick SC, Reith C, Cai D, Huber D, Kanady J, Horowitz T, Separating specific from general learning in a napping paradigm on a Rotary Pursuit task. VSS 2008.
- 23) Mednick SC, Cai D, Kanady J, Drummond SPA, Mednick SA, Napping enhances associative strength in creative problem solving task, APSS 2008.
- 24) Kanady JC, Reed M, Drummond SP, Cai DJ, Leung A, McDevitt EA, Harrison EM, Mednick SC The Actiwatch Assessment of a PSG-recorded Afternoon Nap: A Validation Study APSS 2009
- 25) Elizabeth A. McDevitt, Jennifer C. Kanady, Denise J. Cai, Elizabeth M. Harrison, Sara C. Mednick, Differences in Daytime Sleep Architecture in Habitual and Non-Habitual Nappers APSS 2009
- 26) Mednick SC, Makovski T, Cai DJ, Kanady J, Jiang YV. Sleep and rest facilitate implicit memory in a visual search task. APSS 2009
- 27) Harrison L, Mednick SC, Gorman M, The Influence of Light on Sleep Quality and Architecture during Daytime Naps. APSS 2009
- 28) Mednick SC, Makovski T, Cai DJ, Kanady J, Jiang YV. Sleep and rest facilitate implicit memory in a visual search task. VSS 2009
- 29) Mednick SC, "REM sleep prevents interference in the texture discrimination task.", VSS 2010
- 30) Mednick SC, Jen Kanady, Lizzie McDevitt, James Walsh, Martin Paulus, and Sean P.A. Drummond "Pharmacological enhancement of specific sleep stages in 90-minute naps." APSS 2010
- 31) McDevitt EA, Kanady JC, Cai DJ, Harrison EM, and Mednick SC, Differences in Sleep Architecture of a Nap in Habitual and Non-Habitual Nappers. APSS 2011
- 32) Mednick SC, Brady M, Novel object learning depends on rapid eye movement sleep. APSS 2011
- 33) Knudsen J, Mednick S, McDevitt E, Seek-Hirscher M, Wolf J. Nap-Induced Cortisol Awakening Response is Dependent on Sleep Architecture. Society for Neuroscience 2011.
- 34) Knudsen J, Mednick S, McDevitt E, Seek-Hirscher M, Wolf J. How do you feel after napping? Influence of post-nap cortisol levels and sleep architecture. Society for Neuroscience 2012
- 35) Men need a nap to show perceptual learning but women do not VSS May 2012
- 36) The differing effects of REM and non-REM sleep on performance in visual statistical learning VSS May 2012
- 37) Drug altered sleep enhances memory APSS June 2012
- 38) Does sleep prevent interference and enhance visual statistical learning? May 2012
- 39) Pharmacologically enhanced naps modulate perceptual learning and verbal memory May 2012
- 40) Schapiro, A.C., Rogers, T.T., Norman, K.A., Chen, L., McDevitt, E.A., Mednick, S.C. (2013, June). The role of sleep in consolidating semantic knowledge. Poster presented at SLEEP, Baltimore, MD.
- 41) Schapiro, A.C., Rogers, T.T., Norman, K.A., Chen, L., McDevitt, E.A., Mednick, S.C. (2013, May). The role of sleep in consolidating semantic knowledge. Poster presented at the Vision Sciences Society Meeting, Naples, FL.
- 42) McDevitt EA, Kaestner E, Wixted J, Mednick SC (June, 2013). Pharmacologically increasing sleep spindles enhances recognition for negative and high-arousal emotional memories. Talk to be presented at the 27th Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.
- 43) Ricker AA, Cellini N, Duggan KA, McDevitt EA, Rowe KM, Mednick SC (June, 2013). Are "smart" alarm clocks effective at improving waking experience following a daytime nap? Poster to be presented at the 27th Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.
- 44) Rowe KM, McDevitt EA, Cellini N, Duggan KA, Ricker AA, Mednick SC (June, 2013). Zolpidem increases subjective sleep time estimations in daytime naps. Poster to be presented at the 27th Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.
- 45) Duggan KA, Friedman HS, McDevitt EA, Cellini N, Ricker AA, Rowe KM, Mednick SC (June, 2013). The importance of personality for sleep health. Poster to be presented at the 27th Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.
- 46) Cellini N, McDevitt EA, Ricker AA, Rowe KM, Duggan KA, Mednick SC (June, 2013). Assessment of an automated wireless system for sleep monitoring in daytime naps. Talk to be presented at the 27th Annual Meeting of the Associated Professional Sleep Societies, Baltimore, MD.
- 47) Buman M, Cellini N, McDevitt EA, Gutierrez M, Brinkman J, Ricker A, Mednick SC (under review). Free-living validation of Actigraph-GT3x+ and Actiwatch-64 for 24h monitoring in healthy young adults. Under review for presentation at the 3rd International Conference on Ambulatory Monitoring of Physical Activity and Movement, Amherst, MA (June, 2013).

- 48) McDevitt EA, Afraz A, Mednick SC (May, 2013). Consolidation of associative face memory during sleep is related to spatial position. Poster presented at the Annual Meeting of the Vision Sciences Society, Naples, FL.
- 49) Cellini N, Goodbourn PT, McDevitt EA, Holcombe AO, Martini P, Mednick SC (May, 2013). A daytime nap reduces the attentional blink. Poster presented at the Annual Meeting of the Vision Sciences Society, Naples, FL.
- 50) Peters M, McDevitt EA, Sheremata S, Mednick SC, Silver MA (April, 2013). Cholinergic enhancement of single session perceptual learning is location specific. Poster presented at the Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA.
- 51) Oh, E. S., Duggan, K. A., McDevitt, E. A., & Mednick, S. C. (2013, May). Can't sleep? Maybe you're blue? The relationship between sleep quality, stress, depression, and nap frequency. Poster presented at the UCLA Psychology Undergraduate Research Conference, Los Angeles, CA.
- 52) Rowe, K. M., McDevitt, E. A., Cellini, N., Ricker, A. A., Duggan, K. A., & Mednick, S. C. (2013, February). Time distortion during sleep. Poster presented at the Time In Mental Activity Conference and Training Program, Corfu, Greece.
- 53) Duggan, K. A., McDevitt, E. A., Whitehurst, L. N., & Mednick, S. C. (2014, June). *The association between napping and nighttime sleep quality using self-reports and actigraphy*. Poster presented at the annual meeting of the Associated Professional Sleep Societies (SLEEP), Minneapolis, MN.
- 54) Duggan, K. A., McDevitt, E. A., Whitehurst, L. N., & Mednick, S. C. (2014, June). *Why do people nap? A factor analysis of self-reported sleep habits*. Talk presented at the annual meeting of the Associated Professional Sleep Societies (SLEEP), Minneapolis, MN.
- 55) McDevitt EA, Whitehurst LN, Duggan KA, Mednick SC (May, 2014). Individual differences in sleep-dependent perceptual learning: Habitual vs. non-habitual nappers. Poster presented at the Annual Meeting of the Vision Science Society, St. Pete Beach, FL.
- 56) McDevitt EA, Whitehurst LN, Duggan KA, Mednick SC (June, 2014). Individual differences in sleep spindles and sleep-dependent memory: The impact of habitual napping. Poster presented at the 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN.
- 57) Whitehurst LN, Cellini N, McDevitt EA, Duggan KA, Mednick SC (June, 2014). Evidence for a daytime nap as a "cardiovascular break". Poster to be presented at the 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MI.
- 58) Cellini N, Whitehurst LN, McDevitt EA, Mednick SC (June, 2014). Short-term reliability of heart rate variability measures in a daytime nap. Poster at the 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MI.
- 59) Reihanabad NA, Whitehurst LN, McDevitt EA, Duggan KA, Dela Cruz AL, Perera CA, Mednick SC (June, 2014). The impact of habitual napping on sleep: Spindles and slow wave activity. Poster at the 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MI.
- 60) Perera CA, McDevitt EA, Duggan KA, Whitehurst LN, Reihanabad NA, Dela Cruz AL, Mednick SC (June 2014) Individual differences in sleep-related benefits for creative insight. Poster presented at the 28th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN.
- 61) Dela Cruz, A.L., Duggan, K.A., McDevitt, E.A., Whitehurst, L.N., Oh, E., Perera, C.A., Reihanabad, N.A., Mednick, S.C. (June 2014). Associations between napping and subjective sleep quality: the role of stress, depression, and general health. Poster presented at the 28th meeting of Associated Professional Sleep Societies (SLEEP), Minneapolis, MN.

Oral Presentation Chair Session Moderator

- 2009 APSS "O22: Sleep and Memory Consolidation"
- 2010 VSS "Perceptual learning: Plasticity and adaptation"
- 2010 APSS "O03: Memory Consolidation, Sleep Staging and Naps,"
- 2010 APA " The role of sleep in memory and cognition"
- 2014 APSS "Sleep and Circadian Dysregulation"

Symposium Organizer

- 2010 AAAS "The role of sleep in memory from development to old age"
speakers: Lynn Nadel, Matthew Walker, Marcos Frank, Sean Drummond, Sara Mednick
- 2015 COSYNE, "What can sleep tell us about memory consolidation?"

2016 APSS, "From Circuitry to Behavior: The Role of Sleep in Memory Consolidation."

Invited Editorials

- 2007 "Nap time: How a little sleep can change your life", Union Tribune,
- 2007 "Nodding Off", GOOD
- 2010 "The workplace coffee effect", Room for Debate, New York Times

Selection of Invited Talks

- 2000 Circadian Rhythm Group, Harvard Medical School, Boston, MA
- 2002 Princeton University, Princeton, New Jersey.
- 2002 Charles University, Prague, Czech Republic.
- 2002 Center for Human Information Processing, UCSD, La Jolla CA.
- 2002 University of Southern California, Los Angeles, CA.
- 2002 The Salk Institute, La Jolla, CA.
- 2003 Dartmouth College, Hanover, NH.
- 2003 Sleep and Chronobiology Research Group, VA UCSD, La Jolla CA.
- 2004 J. Christian Gillin Sleep/Chronobiology seminar, UCSD La Jolla, CA.
- 2004 Sleep Research Laboratory Brown University.
- 2004 New York University, Psychology Department. New York, NY
- 2004 Columbia University, Psychology Department. New York, NY
- 2004 City College of New York, Biology Colloquium. New York, NY
- 2004 MIT, Cognitive Science Colloquium. Boston MA
- 2006 Office of Naval Research, San Diego, CA
- 2006 UCSD Department of Psychiatry, La Jolla, CA
- 2006 DARPA, Austin, TX
- 2007 Waking up to Sleep La Jolla CA
- 2007 Biomedical Sciences Library, UCSD
- 2007 DARPA, SC
- 2007 Google, Author Talk series Mountain View, CA,
- 2008 Howell Foundation, La Jolla, CA
- 2008 Francis Parker School, San Diego, CA
- 2008 National Sleep Foundation, Washington D.C.
- 2008 J. Christian Gillin Sleep Lecture, La Jolla, CA
- 2008 The Big Sleep Show, Featured Speaker, Chicago, IL
- 2008 National Academy of Sciences, Irvine CA
- 2008 Insight Meeting of Sloan-Schwartz Foundation, Rancho Santa Fe, CA
- 2009 Mesa Community College San Diego, CA
- 2009 Stanley Middle School San Diego, CA
- 2009 UC San Diego Cognitive Neuroscience Brown Bag, La Jolla, CA
- 2009 UC San Diego Nap-In, La Jolla, CA
- 2009 Harvard University Psychology Department Vision Lab, Cambridge MA
- 2009 Brandeis University Psychology Department Colloquium, Waltham MA
- 2009 UC Berkeley Oxyopia colloquium, Berkeley CA
- 2009 UC Riverside Psychology Department Colloquium, Riverside, CA
- 2009 UC Irvine Psychology Department Colloquium, Irvine, CA
- 2010 Cardiothoracic Surgery Conference Laguna, CA
- 2010 AAAS San Diego, CA
- 2010 Psychology Research Conference, Mission Viejo, CA
- 2010 APA San Diego, CA
- 2010 University of Arizona, Cognitive Science Colloquium, Tucson, AZ
- 2011 University of New York, Binghamton Psychology Department Colloquium
- 2011 University of Massachusetts, Boston, Psychology Department Colloquium
- 2011 University of California, Riverside, Psychology Department Colloquium
- 2012 UC Riverside Nap-In, Riverside, CA

2012 Southern California Learning and Memory Symposium (UCSD)
2012 Center for Chronobiology Symposium (UCSD)
2012 UC Los Angeles Department of Psychology Colloquium, Los Angeles, CA
2012 University of Sydney Department of Psychology Colloquium Australia
2012 University of Melbourne Department of Psychology Colloquium Australia
2012 Queensland Brain Institute Colloquium, Brisbane, Australia
2012 Wolcock Institute for Sleep Medicine, Sydney, Australia
2012 CTRI/UCSD Center for Functional Magnetic Resonance Imaging Joint Symposium on fMRI, La Jolla, CA
2012 Charles River Association for Memory Meeting, Boston University, MA
2013 Arizona State University, Phoenix, AZ
2013 Istituto Italiano do Technologica, Rovereto Italy
2014 MURI conference, La Jolla CA
2014 Center for Integrative Neuroscience, University of Tubingen, Germany
2014 Department of Defense, Washington DC
2014 Department of Psychology, UCLA
2015 Cosyne, Workshop Organizer and Speaker
2015 UC Riverside School of Medicine
2015 MURI conference, La Jolla, CA
2015 Swiss Memory Workshop, Bern, Switzerland
2015 Society of Light Treatment and Biological Rhythms (SLTBR)
2015 Grand Rounds, Department of Neurosurgery, UCLA
2015 University of Irvine
2016 University of Colorado
2017 University of Arizona
2017 University of Dartmouth
2017 University of Virginia
2017 University of Copenhagen
2017 MDRS, Chicago, ILL
2018 Sleep Spindle Conference, Budapest, Hungary
2018 UCLA
2018 Rensselaer Polytechnic Institute
2018 Bard College
2018 JSNC at Caltech
2018 DART Neuroscience
2018 One Day University
2018 International Neuropsychological Symposium, Cassis, France
2019 Borrego Springs Historic Society
2019 MURI conference at UCSD

My research has been covered by CNN, Reuters TV, NPR, The Economist, The Wall Street Journal, Consumer Reports Health Journal, Reader's Digest, The New York Times and many other major media outlets in the US and internationally. Below is a sample from over 300 publications.

Television & Radio

1. Fox News, 2018
2. KPBS, 2017
3. Brain Games, NatGeo, 2015
4. OWN show, Oprah Network, 2014
5. Kudlow Report CNBC, Sept 2013
6. Airtalk, NPR, Sept 2010
7. "What are Dreams?" Science NOVA, August, 2009
8. Interview, *BBC*, Jun 15, 2009
9. How creative are you when you're sleeping? *Voice of America*, Jun 13, 2009

10. UC San Diego Takes a Nap. *KPBS* Mar 9, 2009
11. Talk of The Nation. *NPR* Jun 25, 2007
12. It's time you took a nap! *NPR*, Jun 5, 2007
13. Should we nap at work? *Good Morning America*, Jan 27, 2007

Selected Press

1. Hormone fluctuations and effects on sleep may contribute to memory *Los Angeles Times*-Mar 25, 2019
2. 11 Things No One Ever Told You About Napping *Bustle*-Apr 12, 2019
3. Here's how long your naps should be *New Haven Register*-Apr 10, 2019
4. 5 Rules For Taking The Best Nap Of Your Life *Women's Health*-Jul 3, 2018
5. Office napping climbs out from under the desk and into high-tech pods *Chicago Tribune*-Jul 5, 2018
6. Sleep, How to nap like a pro, *BBC News*, 2015
7. *O Magazine*: Sleep Better from A to ZZZ's, 2014
8. The perfect nap: sleep is a mix of art and science. *Wall Street Journal* 2013
9. Scientist as Star: *Nature* 2010
10. Businesses waking up the benefit of napping, *Bloomberg Businessweek* Sept 2010
11. Better Performance After a Dreaming Nap, *New York Times*, June 2009
12. Problems are solved by sleeping. *Tehran Times* Jun 12, 2009
13. Dopo un sogno ci svegliamo più creativi. *Corriere della Sera* Jun 9, 2009
14. Let Me Sleep On It: Creative Problem Solving Enhanced By REM Sleep. *Science Daily* June 9, 2009
15. Problems are solved by sleeping. *BBC News* Jun 9, 2009
16. The Consult: Back to Bed. *Newsweek* Jun 9, 2009
17. Tests find benefit of sleeping on job. *Independent* Jun 8, 2009
18. The power of naps. *San Diego Union Tribune* (Cover) May 10 2009
19. 2008 Tuesday Morning Quarterback Person of the Year: Sara Mednick, *ESPN* Jan 6, 2009
20. A wake-up call for the sleep deprived *MSNBC* Nov 24, 2008
21. A Daytime Nap Can Boost Memory. *The Washington Post*, Feb 1 2008
22. Scientists still searching for the secrets of sleep. *The Wall Street Journal*, Jan 18, 2008
23. An awakening to nap time. *USA TODAY*, Mar 5, 2007
24. Take five? Researchers say grab an hour. *The Scientist*, Jan 1, 2007
25. Not getting enough sleep? *The Boston Globe*, Apr 2, 2006
26. But a quick nap shows. *The Wall Street Journal*, Nov 17, 2004
27. Napping may be beneficial. *National Public Radio*, Jul 4, 2003
28. Power napsters do it better. *Times of India*, Jun 28, 2003
29. Could 40 winks provide more than a battery recharge? *The Lancet*, Jun 28, 2003
30. Daytime nap is as refreshing as a night's. *The Daily Telegraph* (London), Jun 23, 2003
31. Day dreams as good as a night's sleep. *The Guardian* (London), Jun 23, 2003
32. The power of sleep. *The Boston Globe*, Jan 28, 2003
33. Sleep with the boss. *New Scientist*, Jun 1, 2002
34. Siesta time. *The Economist*, Jun 1, 2002
35. A Quick Power Nap's Benefits. *The New York Times*, May 28, 2002