

**LAWRENCE GREGORY APPELBAUM**

January 5, 2025

**Personal Information**

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**Education**

2004 Ph.D. Psychology, University of California, Irvine.  
Thesis advisor: Dr. George Sperling  
2002 M.S. Psychology, University of California, Irvine  
1995 B.A. Psychology, Emory University, Atlanta, GA

**Academic and Professional Experience**

**Appointments**

2021 – present Professor with tenure. Dept of Psychiatry, University of California, San Diego.  
Neuroscience Graduate Program Faculty, UCSD  
Joint Doctoral Program Graduate Faculty, UCSD/SDSU  
Member, UCSD Institute for Engineering in Medicine  
2021 – 2023 Adjunct Associate Professor. Dept of Psych and Behavioral Sciences, Duke University  
2017 – 2021 Associate Professor. Dept of Psychiatry and Behavioral Sciences, Duke University, NC  
Secondary Appointment, Department of Psychology & Neuroscience, Duke University, NC  
Core Member, Center for Cognitive Neuroscience, Duke University, NC  
2011 – 2017 Assistant Professor. Dept of Psychiatry and Behavioral Sciences, Duke University, NC  
Secondary Appointment, Department of Psychology & Neuroscience, Duke University, NC  
2012 Visiting Faculty Fellow, University of Western Sydney, Sydney Australia.  
2007 – 2008 Instructor, Department of Psychology, University of North Carolina at Chapel Hill, NC  
2006 – 2011 Postdoctoral Fellow, Center for Cognitive Neuroscience, Duke University, NC  
2005 – 2006 Instructor, Department of Psychology, San Francisco State University, San Francisco, CA  
2004 – 2006 NSRA Postdoctoral Fellow, Smith-Kettlewell Eye Research Institute, San Francisco, CA

**Center Directorships**

2021 – present Research Director, UCSD Interventional Psychiatry Program  
2015 – 2021 Founding Director, Brain Stimulation Research Center, Duke University School of Medicine

**Research Laboratory**

Head – Human Performance Optimization Laboratory (Opti Lab), University of California, San Diego.

## **Other Professional Activities**

2022	Consultant – Wave Neuroscience, LLC
2020 – 2022	Consultant – Personal Greatness Index, LLC
2019 – Present	Board of Directors, International Sports Vision Association
2018 – 2022	Advisory Board – NeuroTrainer, LLC
2016 – 2020	Advisory Board – NeuroPlus, LLC
2015 – Present	Founder and President – Psychometric Consulting, LLC,

## **Honors and Awards**

2023	UCSD, Graduate & Professional Student Association, Outstanding Faculty Mentor Award
2018	Outstanding Postdoc Mentor awardee, Duke University School of Medicine
2018	Finalist, MIT Sloan Sports Analytics research paper competition
2017 – 2021	Faculty Associate of the Duke Initiative for Science & Society
2017	Senior Honors, Honoree, Duke University
2012	Duke University, Dean’s Service Recognition for Teaching
2012 - 2013	Visiting Faculty Fellow, Australian International Research Initiatives, U. Western Sydney.
2003	Jack I. Yellot Graduate Student Fellowship, U.C. Irvine
2001 - 2003	University of California Regent’s Fellowship
2002	University of California Regent’s Pre-Dissertation Fellowship
2001 - 2004	University of California Irvine Dean’s Service Award for excellence in teaching

## **Funding**

### **Active Research Support (Reverse chronologically by end date. Dollar amounts for direct costs only.)**

Title: Clinical Decision Support System, Modeling and Model Integration  
Funding Source: Wellcome Leap (subaward through Vanderbilt University)  
Role: Multiple PI with Jeff Daskalakis  
Grant Period: November 1, 2024 through October 31, 2025  
Total funding: \$325,000 (total directs and indirects)  
Summary: The goal of this project is to build predictive models of treatment response to psychiatric interventions for Anhedonic Depression

Title: Adaptive Neuromodulation of Working Memory Networks in Aging and Dementia  
Funding Source: NIH (R01AG068257-01A1)  
Role: Co-Investigator (PI: Simon Davis)  
Grant Period: March 1, 2023 through February 28, 2028  
Total funding: \$2,428,270 direct costs  
Summary: This project is to study and promote brain activity patterns that support healthy memory function in healthy aging and in people at elevated risk for Alzheimer’s disease.

Title: The Multiscale Athlete Moonshot – Appelbaum subaward  
Funding Source: Wu Tsai Human Performance Alliance  
Role: UCSD Investigator  
Grant Period: March 1, 2021 through February 28, 2031  
Total funding: \$120,000 direct costs (through 2/28/25)  
Summary: This research addresses neuroscience-based interventions in athletes to improve performance and machine learning analytics to create predictive measures of on field success

Title: Mindfulness Engaged Neurostimulation for Depression (MEND)  
Funding Source: NIMH R61MH136135  
Role: Co-Investigator (Co-PIs: Dhakshin Ramanathan and Jyoti Mishra)  
Grant Period: May 1, 2024 through April 31, 2026  
Total Funding: \$795,216  
Summary: This project is to study the effectiveness of combined breath-based mindfulness and intermittent theta burst stimulation for treatment of depression

Title: Monitoring stress response and fatigue in laparoscopic surgeons and trainees  
Funding Source: Center for Empathy and Technology's Seed Grant Program  
Role: Co-Investigator (PI: Ying Wu)  
Grant Period: July 1, 2024 through June 30, 2025  
Total funding: \$30,000 direct costs  
Summary: This project is to model task-related psychological stress during laparoscopic training using EEG, ECG, and gaze-based data.

Title: Combined Neuromodulation and Cognitive Training for Post-mTBI Depression  
Funding Source: US. Department of Defense, Congressionally Directed Medical Research Program  
Role: Co-Investigator (PI: Elizabeth Twamley)  
Grant Period: Sept 30, 2022 through Sept 29, 2025  
Total funding: \$1,906,956 direct costs  
Summary: The goal of this project is to evaluate the effectiveness of combined Personalized Augmented Cognitive Training (PACT) and intermittent theta burst stimulation (iTBS) on symptom improvements in patients with mild traumatic brain injury.

Title: Frequency and E-field Enhancement of iTBS for Depression (FREED)  
Funding Source: NIMH (1R61MH129471)  
Role: Co-Investigator (PI: Jeff Daskalakis)  
Grant Period: July 1, 2023 through April 30, 2025  
Total funding: \$4,449,614  
Summary: The goal of this R61/R33 is to test the effectiveness of frequency and electric-field optimized intermittent theta burst stimulus on the treatment of depression.

Title: Personalized Therapeutic Neuromodulation for Anhedonic Depression  
Funding Source: Wellcome Leap  
Role: Co-Investigator (PI: Conor Liston)  
Grant Period: November 1, 2021 through October 31, 2024  
Total funding: \$10,013,701 direct costs (15% effort covered)  
Summary: The goal of this project is to assess the biological targets of rTMS in Anhedonic Depression and test individualized treatment methods for accelerated intermittent theta burst stimulation.

Title: Confirmatory Safety and Efficacy Trial of Magnetic Seizure Therapy for Depression (CREST-MST)  
Funding Source: R01 MH112815, National Institutes of Mental Health  
Role: Co-Investigator (Co PIs: Dan Blumberger and Jeff Daskalakis)  
Grant Period: September 1, 2018 through April 30, 2024 (no cost extension till April 29, 2025)  
Total funding: \$7,424,312.00  
Summary: This study aims to assess the efficacy and tolerability of Magnetic Seizure Therapy as an alternative to Electroconvulsive Therapy for treatment resistant depression.

Title: Ascertaining Neurocircuitry to Enhance Neuromodulation Development (ASCEND)  
Funding Source: National Institute of Mental Health (R01 MH119285)  
Role: PI  
Grant Period: March 1, 2021 – February 29, 2024 (no cost extension until February 29, 2025)  
Total funding: \$109,500, direct costs  
Summary: The goal of this project is to collect neuroimaging biomarkers of Transcranial Magnetic Stimulation, Magnetic Seizure Therapy to evaluate plasticity and determine modulators of treatment response.

Title: Optimizing Individual Treatment Allocation for Precision Psychiatry  
Funding Source: University of California, Academic Senate  
Role: PI  
Grant Period: September 1, 2023 – December 31, 2024  
Total funding: \$8,718  
Summary: The goal of this project is to collect electronic medical records of patients treated through the UCSD Interventional Psychiatry Program to develop predictive algorithms for treatment selection.

Title: Psilocybin-Assisted Therapy to Enhance Physician Well-Being and Reduce Burnout: Clinical Efficacy and Biomarkers of Response  
Funding Source: Sanford Center for Research on Empathy and Compassion  
Role: Co-Investigator (PI: Cory Weissman)  
Grant Period: 8/1/2024 – 7/31/2025  
Total funding: \$100,00  
Summary: This study seeks to evaluate the efficacy of psilocybin-assisted psychotherapy for treating physician burnout.

### **Pending Research Support**

Title: Maintenance rTMS for depression (Maitr-De)  
Funding Source: National Institute of Mental Health (1R61MH138647-01)  
Role: Co-Investigator (PI: Jeff Daskalakis)  
Grant Period: Pending (Anticipated start 12/1/2024)  
Total funding: \$5,522,853  
Summary: This study seeks to compare the efficacy standard and clustered TMS maintenance schedules towards improving brain connectivity and clinical symptom severity

### **Active Mentoring Research Support**

Title: Neuroimaging correlates and feasibility of transcranial magnetic stimulation (TMS) to improve smoking cessation outcomes in Veterans with comorbid PTSD  
Funding Source: U.S. Department of Veterans Affairs, Clinical Science Research and Development (CSR&D), Career Development Award (CDA-2): CDA-2 IK1 CX002187:  
Role: Mentor for Dr. Jonathan Young (with Dr. Jean Beckham)  
Grant Period: 07/01/2023-06/30/2028  
Total funding: \$1,532,300  
Summary: To evaluate feasibility, acceptability, and neuroimaging correlates of a multimodal smoking cessation intervention combining rTMS, cognitive behavioral therapy, and nicotine replacement therapy in Veterans with posttraumatic stress disorder.

## Equipment Grants

Equipment: BrainSight Neuronavigation System, Rogue Research  
Funding Source: Duke University School of Medicine  
Role: PI  
Date: July 1, 2019  
Total funding: \$51,678

Equipment: MagVenture, MCF-B70 TMS coil  
Funding Source: Duke University School of Medicine  
Role: PI  
Date: July 1, 2021  
Total funding: \$7,715

Title: A High-Performance 3T MRI Scanner for Brain Imaging  
Funding Source: NIH HEI program  
Role: Major User and Advisory Committee Member  
Status: Awarded May 20, 2021  
Total funding: \$2,100,000  
Summary: This High-End Instrumentation application is for Premier Ultrahigh Performance 3T GE MRI scanner to add cutting-edge brain imaging capabilities to the Duke Brain Imaging and Analysis Center.

## Completed Research Support

Title: Sensorimotor function in elite soldiers and athletes  
Funding Source: United States Army Research Office [W911NF-15-1-0390]  
Role: PI  
Grant Period: July 10, 2015 through May 31, 2023  
Total funding: \$1,045,725  
Summary: This ARO proposal is investigate sensorimotor function in elite athletes and soldiers and relate this function to injury and achievement.

Title: Neuroimaging correlates and feasibility of transcranial magnetic stimulation to improve smoking cessation outcomes in veterans with PTSD.  
Funding Source: CDA-1 IK1 CX002187: Veterans Administration, Career Development Award  
Role: Mentor for Dr. Jonathan Young (with Dr. Jean Beckham)  
Grant Period: July 4, 2021 through July 3, 2023  
Total funding: \$429,000  
Summary: The goal of this project is to evaluate the feasibility and acceptability of fMRI-guided rTMS as an adjunctive treatment to cognitive behavioral therapy for smoking cessation and nicotine replacement in veterans with PTSD.

Title: Using network-guided TMS to ameliorate memory deficits in early Alzheimer's disease  
Funding Source: NIH R21 AG058161-01A1  
Role: Co-I (PI: Simon Davis)  
Grant Period: September 5, 2020 through September 4, 2022  
Total funding: \$431,216  
Summary: This application is for the development of network-guided TMS to alleviate memory decline associated with early Alzheimer's Disease

Title: Identifying the Optimal Neural Target for Misophonia Interventions  
Funding Source: REAM Foundation  
Role: Co-I (PI Andrada Neacsiu)  
Grant period: July 1, 2020 through June 30, 2022  
Total funding: \$250,000  
Summary: This research award is for dedicated physician time and experimental costs to support TMS interventional studies in adults with Misophonia.

Title: Safety and Feasibility of Transcranial Direct Current Stimulation to Enhance Auditory Rehabilitation in Cochlear Implant Recipients  
Funding Source: Duke MEDx  
Role: Co-I (PIs: Howard Francis and Angel Peterchev)  
Grant Period: October 1, 2020 through September 30, 2021  
Total funding: \$49,691  
Summary: This application is to test the safety and feasibility of home-based tDCS applied during audiological therapy in recent cochlear implant recipients.

Title: Impact of Timing, Targeting and Brain State on rTMS of Human and Non-Human Primates  
Funding Source: RF1MH114253; BRAIN Initiative Award  
Role: Co-I (PI Mark Sommer)  
Grant Period: August 1, 2017 through June 30, 2022  
Total funding: \$1,936,033 (home department sub-award \$1,138,584)  
Summary: This project tests neural dose-response relationships of rTMS in human and non-human primates. Includes subaward to Psychiatry for the portions supervised by Drs. Appelbaum and Peterchev.

Title: Transcranial Magnetic Stimulation with Enhanced Focality and Depth (fdTMS)  
Funding Source: RF1MH114268; BRAIN Initiative Award  
Role: Co-I (PI Angel Peterchev)  
Grant Period: July 21, 2017 through July 20, 2021(1 year NCE)  
Total funding: \$1,000,000  
Summary: This project will develop TMS coils with improved depth-focality tradeoffs.

Title: Quiet TMS: A Low-Acoustic-Noise Transcranial Magnetic Stimulation System  
Funding Source: NIH: R01 MH111865: BRAIN Initiative Award  
Role: Co-I (PI: Angel Peterchev)  
Grant period: September 26, 2016 through June 30, 2021 (in NCE)  
Total funding: \$900,000  
Summary: This award is to develop a novel quiet Transcranial Magnetic Stimulation coil that produces substantially less audible noise during operation.

Title: Using fMRI-guided TMS to increase central executive function in older adults  
Funding Source: National Institute of Aging [U01 AG050618]  
Role: PI (multi PI award with Roberto Cabeza)  
Grant Period: September 1, 2015 through March 31, 2021  
Total funding: \$2,483,010  
Summary: This NIA U01 investigates the capacity for fMRI-guided transcranial magnetic stimulation to produce lasting and generalizable enhancement of working memory in older adults.

Title: Using fMRI-guided TMS to increase central executive function in older adults –  
Administrative Supplement

Funding Source: National Institute of Aging [U01 AG050618-05S1]  
Role: PI (multi PI award with Roberto Cabeza)  
Grant Period: June 15, 2019 through March 31, 2021  
Total funding: \$379,688  
Summary: This Administrative Supplement to the NIA U01 award extends fMRI-guided transcranial magnetic stimulation enhancement of working memory to adults with Mild Cognitive Impairments.

Title: Effect of Connectivity-based rTMS and State-Dependency on Amygdala Activation  
Funding Source: Duke Institute for Brain Sciences, Germinator Award  
Role: Co-PI (with Lysianne Beynel and Nate Kimbrel)  
Grant period: January 1, 2019 through December 31, 2019  
Total funding: \$25,000  
Summary: This award was used to develop and test fMRI connectivity targeting of Transcranial Magnetic Stimulation to modulate Amygdala activity as a potential therapeutic for PTSD.

Title: Attentional Mechanisms in Multisensory Environments  
Funding Source: NIH: R01-NS051048-06  
Role: Co-I (PI: Marty Woldorff)  
Grant period: September 1, 2012 through August 30, 2017  
Total funding: \$1,200,000  
Summary: This research utilized simultaneously recorded EEG & fMRI to study the mechanisms of multisensory attention.

Title: SSNAP: Scientific Social Network Analysis Project  
Funding Source: Duke University Bass Connections  
Role: Co-PI  
Grant period: June 1, 2016 through May 30, 2017  
Total funding: \$12,500  
Summary: This award through the Duke University Bass Connections built network analysis tools to examine collaborations within different fields of study within the larger research community.

Title: Transcranial Magnetic Stimulation modulation of insula-based functional connectivity  
Funding Source: Duke University Institute for Brain Sciences  
Role: Co-PI (with Merideth Addicott)  
Grant period: July 1, 2016 through June 30, 2017  
Total funding: \$75,000  
Summary: Duke Institute for Brain Sciences, Incubator Award to investigate the use of TMS to strengthen brain connectivity with the insula as a potential treatment for smoking addiction.

Title: Real-Time Workload Detection in Supervisory Control Applications using fNIRS  
Funding Source: Duke University Institute for Brain Sciences  
Role: Co-PI (with Missy Cummings)  
Grant period: July 1, 2014 through June 30, 2016 (in No-Cost Extension)  
Total funding: \$30,000  
Summary: This incubator award through the Duke Institute for Brain Sciences supported research using functional Near-Infrared Spectroscopy to measure cognitive workload.

Title: Mapping the Semantic Structure of Neuroscience  
Funding Source: Duke University Institute for Brain Sciences  
Role: Co-PI (with Scott Huettel)  
Grant period: July 1, 2013 through August 30, 2015

Total funding: \$25,000  
Summary: This incubator award through the Duke Institute for Brain Sciences funded the development and application of quantitative methods for synthesizing the neuroscience literature.

Title: Tracking Neurological Function in Warrior-Athletes: A Multidisciplinary Approach  
Funding Source: United States Army Special Operations Command/DARPA [H92236-14-P-5193]  
Role: Co-I (PI: Jason Mihalik, UNC)  
Grant Period: July 1, 2014 through June 30, 2015  
Sub-Contract: \$25,000  
Summary: This research sub-contract (prime contractor, UNC-Chapel Hill) was to develop a database of sensorimotor function before and after head trauma in US Special Operations soldiers.

Title: Self-Guided Parameter Fitting for Cochlear Implant Users  
Funding Source: Duke University Bass Connections  
Role: Co-PI  
Grant period: June 1, 2014 through May 30, 2015  
Total funding: \$12,500  
Summary: This award through the Duke University Bass Connections established a user-end, self-guided system for the optimization of electronic parameters for cochlear implant users.

Title: Operational Neuroscience for Warfighter Performance  
Funding Source: Naval Health Research Center (NHRC BAA 13-001)  
Role: PI  
Grant Period: May 1, 2014 through April 30, 2015  
Sub-Contract: \$89,162  
Summary: This grant supported research testing the effectiveness of vision screening and training techniques in Navy Special Operations soldiers.

Title: Identifying, Assessing, and Enhancing Human Perceptual and Cognitive Abilities  
Funding Source: DARPA: D12AP00025-002  
Role: Corresponding PI (multi PI award with Steve Mitroff)  
Grant period: October 1, 2012 through July 31, 2014  
Total funding: \$987,000  
Summary: This research studied how perceptual and visual-motor abilities vary across the population though large-scale psychometrics, neuroimaging, and genetics.

Title: The Neural Mechanisms of Texture Segmentation  
Funding Source: NIH: F32-EY14536  
Role: PI (NRSA Postdoctoral Fellow)  
Grant period: October 1, 2004 through June 30, 2006  
Total funding: \$92,347  
Summary: This NRSA award used EEG and fMRI to study the neural mechanisms underlying visual perception and volitional attention – Mentor, Dr. Tony Norcia.

## **Patents**

Diagnostic and treatment prediction model in major depressive disorder using rest EEG and convolutional neural network

Named Inventor – provisional patent application filed October 2024



## Publications

### Refereed Journal Articles (in reverse chronological order)

H-Index = 39/29, Citations = 5507/3294, Google Scholar/Scopus) – As of December 9, 2024

1. Appelbaum, L.G., Daniels, H., Lochhead, L., Bacio, B., Cash, R., Weissman, C.R., Kohn, J., Hadas, I., & Daskalakis, Z., (in press at **JAMA Network Open**) Evidence of efficacy for accelerated intermittent theta-burst stimulation for treatment resistant bipolar depression: a randomized controlled trial.
2. Lochhead, L., Feng, J., Laby, D.M., & Appelbaum, L.G., (in press at **International Review of Sport and Exercise Psychology**) Training vision in athletes to improve sports performance: a systematic review of the literature
3. Benster, L., Stapper, N., Rodriguez, K., Daniels, H., Villodas, M., Weissman, C.R., Daskalakis, Z.J., & Appelbaum, L.G., (accepted to **Brain Sciences**) Developmental predictors of suicidality in schizophrenia: A systematic review.
4. Couture M, Jodoin VD, Bousseau E, et al: Spaced transcranial direct current stimulation protocol for major depression. **Am J Psychiatry** (in press). Accepted for publication 14 June 2024.
5. Appelbaum, L.G., Lochhead, L., Feng, J. et al. Limited Evidence is Not No Evidence: A Rebuttal to Fransen, 2024. **Sports Med** (2024).
6. Raja, S., Guptill, J., Mack, M., Peterson, M., Byard, S., ... Zarate, C., & Thomas, C. (2024) A Phase 1 Assessment of the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of (2R,6R)-Hydroxynorketamine in Healthy Volunteers. **Clinical Pharmacology and Therapeutics**. 116(5), 1314-1324.
7. Kohn, J. N., Lochhead, L., Feng, J., Bobb, R., & Appelbaum, L. G. (2024). Strength, speed, and anthropometric predictors of in-game batting performance in baseball. **Journal of Sports Sciences**, 42(8), 720–727.
8. Young J.R., Galla, J.T., Polick, C.S., Deng Z-D, Dannhauer, M., Moore, S.D., Dedert, E.A. Addicott, M.A, Appelbaum, L.G., Beckham, J.C., (2024) Multimodal smoking cessation treatment combining transcranial magnetic stimulation, cognitive behavioral therapy, and nicotine replacement therapy in veterans with posttraumatic stress disorder: A feasibility randomized controlled trial protocol. **PLOS One**. 19(9): e0291562.
9. Lochhead, L., Feng, J., Laby, D.M., & Appelbaum, L.G., (2024) Visual performance and sports: a scoping review. **Journal of Sports and Exercise Psychology**. ePub Ahead of Print.
10. Nagra, D., Stolz, L.A., Weissman, C.R., & Appelbaum, L.G., (2024) Access to Interventional Psychiatry Treatments in the United States: Disparities and Proposed Solutions. **Global Health Economics and Sustainability**. 2(1):2456
11. Koponen L.M., Martinez M., Wood E., Murphy D.L.K., Goetz S.M., Appelbaum L.G. and Peterchev A.V. (2024) Transcranial magnetic stimulation input–output curve slope differences suggest variation in recruitment across muscle representations in primary motor cortex. **Front. Hum. Neurosci**. 18:1310320. doi: 10.3389/fnhum.2024.1310320
12. Feng, Z., Lochhead, L., Kohn, J.N., & Appelbaum, L.G. (2024) Predictors of batting and pitching performance in the USA Baseball Prospect Development Pipeline. **Sports Biomechanics**. Jan 8:1-19.

13. Benster, L., Weissman, C.R., Stolz, L., Daskalakis, Z., & Appelbaum L.G. (2023) Pre-clinical indications of brain stimulation treatments for non-affective psychiatric disorders, a status update. **Translational Psychiatry**. 13:390
14. Shenasa, M.A., Soltani, M., Tang, V., Weissman, C., Appelbaum, L. G., Daskalakis, Z., & Ramanathan, (2023) Repetitive transcranial magnetic stimulation implementation within residential substance use disorder treatment centers for patients with comorbid depression. **Advances in Dual Diagnosis**. 16(4), 209-217.
15. Stolz, L., Kohn, J., Smith, S., Benster, L., & Appelbaum, L. (2023) Predictive biomarkers of treatment response in Major Depressive Disorder. **Brain Sciences**. 13(11), 1570.
16. Stolz, L.A., Liu, S., Asamo, E., & Appelbaum, L.G., (2023) Neurobehavioral measures of coincidence anticipation timing. **Journal of Vision**. 23(16).
17. Dambrosia, C., Aronoff-Spencer, E., Huang, E.Y., Goldhaber, N.H., Jacobsen, G., Sandler, B., Horgan, S., Appelbaum, L.G., Christensen, H., & Broderick, R.C., (2023) The physiology of intraoperative error: using electrokardiograms to understand operator performance during robot-assisted surgery simulations. **Surgical Endoscopy**. 37(6).
18. Dambrosia, C., Aronoff-Spencer, E., Huang, E.Y., Goldhaber, N.H., Christensen, H., Broderick, R.C., & Appelbaum, L.G., (2023) The Neurophysiology of Intraoperative Error: An EEG Study of Trainee Surgeons during Robotic-Assisted Surgery Simulations. **Frontiers in Neuroergonomics**. 3(1).
19. Ho J, Liu S, Feng Z, Appelbaum LG (2023) Psychomotor and visual skills underlying position specialization in 1352 elite youth baseball players. **PLoS ONE** 18(1): e0278689.
20. Subramaniam, A., Liu, S., Lochhead, L., & Appelbaum, L.G., (2022) A systematic review of transcranial direct current stimulation on eye movements and associated psychological function. **Reviews in the Neurosciences**. 31;34(3):349-364.
21. Bukhari-Parlakturk, N., Lutz, M., Al-Khalidi, H., Unnithan, S., Wang, J., Scott, B., Termsarasab, P., Appelbaum, L.G., & Calakos, N. (2022) Suitability of Automated Writing Measures for Clinical Trial Outcome in Writer's Cramp. **Movement Disorders**. 38(1), 123-132.
22. Appelbaum, L.G., Shensa, M.A., Stolz, L., & Daskalakis, Z. (2022) Synaptic plasticity and mental health: methods, challenges and opportunities. **Neuropsychopharmacology**.
23. Laby, D., Appelbaum, L.G., Hülzdünker, T., and Putrino, D., (2022) Editorial: Neural Mechanisms of Perceptual-Cognitive Expertise in Elite Performers. **Frontiers in Human Neuroscience**.
24. Neacsiu, A.D., Beynel, L., Graner, J.L., Szabo, S.T., Appelbaum, L.G., Smoski, M.J. & LaBar, K.S (2022) Enhancing Cognitive Restructuring with Concurrent fMRI-guided Neurostimulation for Emotional Dysregulation: A Randomized Controlled Trial. **Journal of Affective Disorders**. 301(15), 378-389.
25. Donaldson, R., Liu, S., & Appelbaum, L.G., (2022) Can Electricity Help Surgeons' Brains Learn Faster? **Frontiers in Young Minds**. 10(767519). doi: 10.3389/frym.2022.767519.
26. Dubljevic, V., Young, J.R., & Appelbaum, L.G., (2022) Diversifying the bioethics funding landscape: the case of TMS. **American Journal of Bioethics**. 22(1), 28-30.
27. Beynel, L., Dannhauer, M., Palmer, H., Hilbig, S., Crowell, C.A., Wang, J.E-H., Michael, A.M., Wood, E.A., Luber, B., Lisanby, S.H. Peterchev, A.V., Cabeza, R., Davis, S.W., & Appelbaum, L.G., (2021) Network-based rTMS to modulate working memory: the difficult choice of effective parameters for online interventions. **Brain and Behavior**. 40(35) 6770-6778.

28. Liu, S., Folstein, J.R., Appelbaum, L.G., and Tenenbaum, G. (2021) The mechanism of controlling unwanted intrusive thoughts: A randomized controlled study with choking experiences in athletes. **Journal of Experimental Psychology: Human Perception and Performance**. 47(10): 1395-1408.
29. Neacsiu, A.D., Beynel, L., Powers, J.P., Szabo, S., Appelbaum, L.G., Lisanby, S.H., & LaBar, K.S (2021) Enhancing Cognitive Restructuring with Concurrent Repetitive Transcranial Magnetic Stimulation: A Transdiagnostic Randomized Controlled Trial. **Psychotherapy and Psychosomatics**. Online ahead of print. doi: 10.1159/000518957.
30. Young, J.R., Galla, J.T., & Appelbaum, L.G., (2021) Transcranial Magnetic Stimulation Treatment for Smoking Cessation: An Introduction for Primary Care Clinicians. **American Journal of Medicine**. 134(11): 1339-1343.
31. Laby, D. & Appelbaum, L.G. (2021) Vision and On-field Performance: A Critical Review of Visual Assessment and Training Studies with Athletes. **Optometry and Vision Science**. 98(7):723-731.
32. Fogt, N., Appelbaum, L.G., Dalton, K., Erickson, G. & Gray, R. (2021) Guest Editorial: Visual function and sports performance. **Optometry and Vision Science**. 98(7):669-671, July 2021.
33. Liu, S., Clements, J.M., Kirsch, E.P., Rao, H., Zielinski, D. J., Lu, Y., Mainsah, B.O., Potter, N.D., Sommer, M. A., Kopper, R., and Appelbaum, L. G. (2021) Psychophysiological Markers of Performance and Learning during Simulated Marksmanship in Immersive Virtual Reality. **Journal of Cognitive Neuroscience**. 33(7); 1253-1270.
34. Laby, D.M. & Appelbaum, L.G., (2021) Comment on Nascimento et al. Citations Network Analysis of Vision and Sport. **International Journal of Environmental Research and Public Health**. 2021; 18(12):6488.
35. Beynel, L. Campbell, E., Naclerio, M., Galla, J.T., Ghosal, A., Michael, A. M, Kimbrel, N.A., Davis, S.W., & Appelbaum, L.G. (2021). The effects of functionally-guided, connectivity-based rTMS on amygdala activation. **Brain Sciences**. 11(4), 494.
36. Liu, S., Donaldson, R., Subramaniam, A., Palmer, H., Champion, C., Cox, M., & Appelbaum, L.G. (2021) Developing Expert Gaze Pattern in Laparoscopic Surgery Requires More than Behavioral Training. **Journal of Eye Movement Research**. 14(2).
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### Book Chapters and Sections

1. Beynel, L., Appelbaum, L.G., & Kimbrel, N. A. (2020). Neurobiology and neuromodulation of emotion in posttraumatic stress disorder. In M.T. Tull and N.A. Kimbrel (Eds.). **Emotion in Posttraumatic Stress Disorder**. Academic Press, Cambridge, MA.
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## Refereed Conference Papers

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## Publicly Available Pre-Print Papers

1. Bukhari-Parlakturk N, Mulcahey PJ, Lutz M, Ghazi R, Huang Z, Dannhauer M, Simsek Z, Groves S, Lipp M, Fei M, Tran T, Wood E, Beynel L, Scott B, Termsarasab P, Petty C, Al-Khalidi HR, Voyvodic J, Appelbaum LG, Davis S, Michael A, Peterchev AV, Calakos N. (2024) TMS target comparison identifies motor network reorganization associated with behavioral improvement in writer's cramp dystonia. **medRxiv**. doi: <https://doi.org/10.1101/2024.09.30.24314652>
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### Textbook Contributions

1. Appelbaum, L.G. (2013). "Deriving Event Related Potentials" In Visual Psychophysics: From Theory to Laboratory, by Lu, Z-L. MIT Press.
2. Appelbaum, L.G. (2009). Figure 1.6 "Retinotopy". In Functional Magnetic Resonance Imaging, 2nd Ed. By Huettel S.A., Song, A.W., and McCarthy, G. Sinauer.

### Other Contributions

1. Insights into Sports Vision newsletter: Sports Vision Research: Seeing Improvements

### Pre-Registered Clinical and Research Trials

1. Appelbaum, L.G., et al. (2016) Using TMS to Increase Executive Function in Older Adults (WMTMS). NCT02767323. <https://clinicaltrials.gov/ct2/show/NCT02767323>.
2. Appelbaum, L.G., et al. (2017) Effects of rTMS on Human Brain Activity Measured with EEG and fMRI. NCT03259568. <https://clinicaltrials.gov/ct2/show/NCT03259568>.

3. Appelbaum, L.G., et al. (2018) Utilizing Transcranial Direct Current Stimulation to Enhance Laparoscopic Technical Skills Training. NCT03083483. <https://clinicaltrials.gov/ct2/show/NCT03083483>
4. Appelbaum, L.G., et al. (2017) Utilizing Gaze Training to Enhance Laparoscopic Skills Training. NCT03413943. <https://clinicaltrials.gov/ct2/show/NCT03413943>
5. Appelbaum, L. G., Liu, S., Hilbig, S., Rankin, K., Naclario, M., Asamo, E., ... Burris, K. (2018). Sports Vision Training in Collegiate Baseball Batters. doi: 10.17605/OSF.IO/496RX.
6. Liu, S., Folstein, J., Appelbaum, L. G., & Tenenbaum, G. (2019). The mechanism of controlling unwanted intrusive thoughts. Retrieved from [osf.io/ydmsv](https://osf.io/ydmsv)

## **Pre-Registered Meta Analyses and Reviews**

1. Beynel, L., Appelbaum, L.G., Davis, S. W., Luber, B., Hilbig, S., and Deng, Z.-D. (2016) Effects of online repetitive transcranial magnetic stimulation (rTMS) on cognitive processes: a systematic review and meta-analysis. PROSPERO #CRD42016038981. [www.crd.york.ac.uk/PROSPERO/display\\_record.php?ID=CRD42016038981](http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42016038981)
2. Beynel, L., & Appelbaum, L.G., (2019) Effects of repetitive transcranial magnetic stimulation (rTMS) on resting state connectivity: a qualitative review. PROSPERO #CRD42019119982. [http://www.crd.york.ac.uk/PROSPERO/display\\_record.php?ID=CRD42019119982](http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42019119982)
3. Subramaniam, A., Appelbaum, L.G., & Liu, S. (2020) Systematic review of non-invasive brain stimulation and eye-tracking in research on human attention, perception, and behavior. PROSPERO #CRD42020214236. [https://www.crd.york.ac.uk/PROSPERO/display\\_record.php?RecordID=214236](https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=214236)

## **Invited Talks and Colloquia**

Dec 2024	Pennington Biomedical Seminar	Baton Rouge, LA
Oct 2024	U. Penn Neuromodulation Speaker Series	Virtual (through U. Penn)
May 2024	SENSE Faculty Seminar	Lausanne Switzerland
Jan 2024	San Diego VA, CESAMH Clinical Neuroscience Unit	San Diego, CA
Nov 2023	SD Baseball Sports Medicine Meeting	Point Loma Nazarene University
Mar 2023	Wu Tsai Human Performance Alliance Inaugural Symposium	Stanford, CA
Oct 2022	Sheldon M. Golden Seminar on TBI	UC Berkeley
Feb 2022	UCSD T32 Biological Psychiatry Fellowship	UC San Diego
Nov 2021	International Clinical Neuroergonomics	Virtual
Nov 2021	Addiction Special Interest Group	UC San Diego
Oct 2021	Fechner Day Keynote Speaker	U. Missouri, St. Louis
May 2021	Markou Seminar	UC San Diego
Feb 2020	Palo Alto Research Company, Xerox	Palo Alto, CA
Feb 2020	International Sports Vision Assoc.	San Diego, CA
Feb 2019	International Sports Vision Assoc.	Park City, UT
Nov 2018	Duke University	Future of Surgery Symposium
Apr 2018	U. Waterloo Sports Vision Club	Waterloo Canada
Feb 2018	International Sports Vision Assoc.	Park City, UT
Sept 2017	Duke University	Center for Cognitive Neuroscience
June 2017	Triangle Assessment Network Grp	NetApps Headquarters, Apex NC
Apr 2017	Sports Vision Consortium	VSP Headquarters, Sacramento CA.

Oct 2016	Duke Sports Sciences Institute	Bassett Society Annual Meeting
June 2015	Duke University	Society for Philosophy and Psychology
Mar 2015	NIMBioS, Knoxville TN	Neurobiology of Expertise Workshop
Feb 2015	Womack Army Medical Hospital	Grand Rounds
Jan 2015	Duke University	Data Visualization Workshop – Perkins Library
Mar 2014	U. North Carolina, Chapel Hill	Department of Psychology
Mar 2014	Duke Medical Center	Brain Stimulation Division Meeting
Jan 2014	University of California, Irvine	Department of Cognitive Sciences
Dec 2013	System Planning Corp. (DARPA)	Quantifying Warriors Workshop
Apr 2013	Duke Medical Center	Department of Psychiatry
Dec 2012	University of New South Wales	Sydney Perception Group
Dec 2012	University of Western Sydney	MARCS Auditory Institute Workshop
Nov 2012	Duke University	Digital Scholarship Series – Perkins Library
Oct 2012	Duke University	Center for Cognitive Neuroscience
Mar 2012	Duke University	Computer Science - Visualization Techy Group
Apr 2012	Duke University	Sawyer Seminar Series
Feb 2011	University of Arizona at Tucson	Department of Psychology
Nov 2010	Reed College	Department of Psychology
Sept 2009	Osher Lifelong Learning Institute	Cognitive Neuroscience Lecture Series
Feb 2008	U. North Carolina, Chapel Hill	Department of Psychology
July 2006	Stanford University	Department of Psychology
Feb 2006	Smith-Kettlewell Institute	Brown Bag Talk Series
Jan 2006	Duke University	Center for Cognitive Neuroscience
Apr 2005	U. California San Francisco	Cognitive Neuroscience Working Group

## **Conference Presentations**

### **2025**

1. Appelbaum, L.G., Kohn, J., Stolz, L., Benster, L., Poorganji, M., Sun, Y., Stapper, N., Weissman, C.R. and Daskalakis, Z.J., Predicting treatment response to repetitive transcranial magnetic stimulation from medical records and electroencephalography. Society for Biological Psychiatry, April 24-26, Toronto CA,
2. Stapper, N., Sun, Y., Poorganji, M., Hadas, I., Zomorodi, R., Fitzgerald, P. B., Blumberger, D. M., Appelbaum, L. G., Daskalakis, Z. J., & Weissman, C. R. (2025). TMS-EEG biomarkers of suicidal ideation. Symposium at the 6th International Brain Stimulation Conference, Kobe, Japan.
3. Sun, Y., Poorganji, M., Boyd, E., Lochhead, L., Rodriguez, K., Hadas, I., Daskalakis, Z. J.\*, Appelbaum, L. G.\* (2025). Relationship between TMS-EEG source activity in the subgenual cingulate following left dorsolateral prefrontal cortex stimulation and the resting state functional connectivity between the two regions. Symposium at the 6th International Brain Stimulation Conference, Kobe, Japan. (\*co-senior)
4. M., Couture et al... (2025) Feasibility and Preliminary Outcomes of Spaced Transcranial Direct Current Stimulation in Major Depression. 6th International Brain Stimulation Conference, February 23–26, 2025, in Kobe, Japan.

### **2024**

5. Zakrzewski, J. J., Appelbaum, L. G. Weismann, C. R., Hadas, I., Ayers, C. R., Daskalakis, Z. J., & Twamley, E. W. (2025, February). Repetitive Transcranial Magnetic Stimulation (rTMS) Treatment for Comorbid Major Depressive Disorder and Hoarding Disorder: An Open Label Pilot Study. Accepted poster presentation at the 53<sup>rd</sup> meeting of the International Neuropsychological Society in New Orleans, LA.

6. Bukhari-Parlakturk N, Mulcahey PJ, Lutz M, Ghazi R, Huang Z, Dannhauer M, Simsek Z, Groves S, Lipp M, Fei M, Tran T, Wood E, Beynel L, Scott B, Termsarasab P, Petty C, Al-Khalidi HR, Voyvodic J, Appelbaum LG, Davis S, Michael A, Peterchev AV, Calakos N. TMS target comparison identifies motor network reorganization associated with behavioral improvement in writer's cramp dystonia. 149th annual meeting of the American Neurological Association. Orlando, FL; 2024 Sep 16.
7. Bukhari-Parlakturk N, Mulcahey PJ, Lutz M, Ghazi R, Huang Z, Dannhauer M, Simsek Z, Groves S, Lipp M, Fei M, Tran T, Wood E, Beynel L, Scott B, Termsarasab P, Petty C, Al-Khalidi HR, Voyvodic J, Appelbaum LG, Davis S, Michael A, Peterchev AV, Calakos N. TMS target comparison identifies motor network reorganization associated with behavioral improvement in writer's cramp dystonia. 2024 International Congress of Parkinson's Disease and Movement Disorder. Philadelphia, PA; 2024 Sept 30.
8. Poorganji M., Sun, Y., Rodriguez, K., Weissman, C., Miron, J-P., Kohn, J., Daskalakis, Z., and Appelbaum, L.G., "Resting-state EEG connectivity as predictive and diagnostic biomarker in Major Depressive Disorder" - NYC Neuromodulation Conference, Poster, New York, NY, 2024
9. Stolz L.A., Kohn J.N., Smith S., Benster L., Appelbaum., G. Predictive biomarkers of treatment response in Major Depressive Disorder. NYC Neuromodulation Conference, Talk, New York, NY, 2024
10. Lange, L., Sankar, V.V., Appelbaum, L.G., Broderick, R.C., Cai, Y., Chordiya, P., Jung, T-P., Spurzem, G.J., and Wu, Y.C. (2024) Decoding Psychological Stress during Laparoscopic Surgery Training: Insights from EEG. 31st International Conference on Neural Information Processing., Auckland, New Zealand. Dec 2-6, 2024.
11. B. Wang, V. Shah, L. M. Koponen., S. M. Goetz, A. D. Neacsiu, J. Y. Choi, Z. J. Daskalakis, P. B. Fitzgerald, L. G. Appelbaum, I. Hadas, H. Daniels, K. Rodrigues, E. S. Gotsis, N. W. Bailey, J. Raveendran, A. T. Gallo, S. Brinley, and A. V. Peterchev, (2024) Stochastic Approximator of Motor Threshold for Transcranial Magnetic Stimulation (SAMT): Performance in Clinical Trials, NYC Neuromodulation Conf., New York, NY, USA, July 31–Aug. 4, 2024.
12. Benster, L., Suprani, F., Weissman, C., Toney, K., Afshar, H., Daskalakis, Z., Appelbaum, L., Kohn, J. (2024) Predictors of treatment response to rTMS in treatment-resistant depression: a retrospective clinical cohort study. NYC Neuromodulation Conf., New York, NY, USA, July 31–Aug. 4, 2024.
13. Stapper, N., Kohn, J., Benster, L., Tello, V., Appelbaum, L., Weissman, C. Predictors of Decreases in Suicidal Ideation in Patients with Treatment-Resistant Depression Receiving Repetitive Transcranial Magnetic Stimulation Treatment: A Retrospective Clinical Cohort Analysis. Society for Biological Psychiatry, Austin, TX. May 2024
14. Benster, L., Suprani, F., Weissman, C.R., Toney, K., Afshar, H., Daskalakis, Z., Appelbaum, L.G., and Kohn, J. Predictors of treatment response to repetitive transcranial magnetic stimulation in treatment-resistant depression: a retrospective clinical cohort study. Society for Biological Psychiatry, Austin, TX. May 2024

## 2023

15. Appelbaum, L.G., Visual Expertise in Baseball. San Diego Baseball Sports Medicine Meeting. November 10, 2023.
16. Bukhari-Parlakturk N, Lutz M, Al-Khalidi R H, Unnithan S, Wang J, Scott B, Termsarasab P, Lawrence A, Calakos N. Suitability of automated writing measures for clinical trial outcome in writer's cramp. Samuel Belzberg 6th International Dystonia Symposium. Dublin, Ireland. June 1-3, 2023. poster presentation.
17. Bukhari-Parlakturk, N., Mulcahey, P., Lutz, M., Ghazi, R., Huang, Z., Dannhauer, M., Simsek, Z., Groves, S., Lipp, M., Fei, M., Tran, T., Wood, E., Beynel, L., Scott, B., Termsarasab, P., Petty, C., Al-

Khalidi, R-H., Voyvodic, J., Appelbaum, L.G., Davis, S., Michael, A., Peterchev, A., & Calakos, N., “Functional MRI-guided individualized TMS modifies motor network and reduces writing dysfluency in focal hand dystonia.” Human Brain Mapping Conference. Montreal, Canada. July 22-26, 2023. virtual poster presentation.

18. Young JR, Galla JT, Polick C, Papanikolas W, Evans M, Dedert E, Addicott M, Moore SD, Appelbaum LG, Beckham JC. Multimodal Smoking Cessation Using rTMS, CBT and NRT in Veterans with PTSD: Results from a Nonrandomized Phase II Trial. 2023 Society of Biological Psychiatry (SOBP). San Diego, CA.
19. Suprani, F., Benster, L., Jiang, T., Appelbaum, L., Daskalakis, Z., Weissman, C. (2023, April 27-29). “The role of concurrent antidepressant medications on repetitive transcranial magnetic stimulation (rTMS) effectiveness in treatment-resistant depression (TRD)” [Conference]. Society for Biological Psychiatry, San Diego, CA.

## 2022

20. Beynel, L., Deng, L., Crowell, C.A., Dannhauer, M., Hilbig, S.A., Palmer, H., Britto, A., Peterchev, A.V., Cabeza, R., Luber, B., Lisanby, S.H., Appelbaum, L.G. & Davis, S.W., (2022) Network controllability: a potential targeting approach for TMS, with important considerations for aging. 61st American College of Neuropsychopharmacology, Phoenix, AZ, Dec 7, 2022.
21. Bukhari-Parlakturk, N., Michael, A., Peterchev, A.P., Davis, S.W., Appelbaum, L.G., Dannhauer, M., Huang, Z., Groves, S., Voyvodic, J. Petty, C, Wood, E., Beynell, L., & Calakos, N. Engagement of Deep Brain Network as a Predictor Biomarker for Clinical Response to TMS. ISMRM Workshop on MRI of Neuromodulation: Target Engagement, Neural Mechanism & Biomarker Development in Bethesda, MD, USA October 20, 2022.
22. Appelbaum, L.G., Expediting skills acquisition in surgeons through psychophysiological monitoring and brain stimulation, In, Boosting Performance: The Mind. The Joint Meeting of Neuroergonomics and NYC Neuromodulation, New York City, July 29, 2022
23. Appelbaum, L.G., Vision and on-field performance: do elite athletes have better vision and can training improve performance, In, Boosting Performance: The Body. The Joint Meeting of Neuroergonomics and NYC Neuromodulation, New York City, July 30, 2022
24. Deng, L., Gamboa, O.L., Jonnalagadda, A., Dannhauer, M., Hamdan, R., Crowell, C., Wang, F., Goswami, N., Kothare, R., Peterchev, A.V., Sommer, M.A., Applebaum, L.G., Cabeza, R., & Davis, S.W. Impact of Timing, Targeting, and Brain State on rTMS of Human and Non-Human Primates, 7th Annual BRAIN Initiative Investigators Meeting, Washington, D.C., June 2022.
25. Appelbaum, L.G. & Liu, S. Expediting skill acquisition through psychophysiological monitoring and brain stimulation during surgical simulations. 29th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA. April 2022
26. Fogt, N. and Appelbaum, L.G. Research Review: A roadmap to build the evidence base for sports vision. International Sports Vision Association Feb 12, 2022. Kissimmee FL.

## 2021

27. Dannhauer, M., Huang, Z., Beynel, L., Wood, E., Li, Y., Palmer, H., Hilbig, S., Davis, S.W., Cabeza, R., & Applebaum, L.G., TAP: Targeting and analysis pipeline for optimization and verification of TMS coil placement. Human Brain Mapping. November 1. 2021, Brain Stimulation 14:P1620 (2021) 1589e1707. DOI: <https://doi.org/10.1016/j.brs.2021.10.102>
28. Peterchev, A.P., Koponen, L., Gomez, L., Zeng, Z., Hamdan, R., Wood, E., Dannhauer, M., Li, Z., Applebaum, L.G., & Murphy, D., How focal and quiet can TMS be? Human Brain Mapping. November 1. 2021, Brain Stimulation 14:6 (2021) <https://doi.org/10.1016/j.brs.2021.10.547>

29. Deng, L., Gamboa Arana, O.L, Davis, S., Jonnalagadda, M., Hamdan, R., Crowell, C, Wang, F., Goswami, N., Kothare, R., Peterchev, A., Sommer, M.A., Appelbaum, L.G., Cabeza, R., Davis, S.W., Impact of Timing, Targeting, and Brain State on rTMS of Human and Non-Human Primates. 7th Annual BRAIN Initiative Investigators Meeting, Washington, D.C., June 2021.
30. Appelbaum, L.G., Liu, S., Ferris, L.M., Hilbig, S., Asamoia, E., LaRue, J.L., Lyon, D., Connolly, K., & Port, N. Dynamic vision training transfers positively to batting performance among collegiate baseball batters. Expertise and Skill Acquisition Network (EASN) Virtual Conference, May 2021.
31. Liu, S., Donaldson, R., Subramaniam, A., Palmer, H., Champion, C. D., Cox, M. L., & Appelbaum, L. G. (2021, June). Developing expert gaze pattern in laparoscopic surgery requires more than behavioral training. Verbal presentation at the annual conference of the North American Society for the Psychology of Sport and Physical Activity (NASPSPA), Virtual Conference.
32. Lubner, B., Beynel, L. , Appelbaum, L.G., Deng, Z.-D. , Jones, T., Harrison, A., Lo, E., McKinley, A. R., & Lisanby, S.H. (2021). Individualized alpha frequency rTMS to the inferior frontal junction enhances visual search. 27th Annual Meeting of Organization of Human Brain Mapping.

## 2020

33. Sommer, M., Appelbaum, L.G., Cabeza, R., Davis, S., Peterchev, A., Gamboa-Arana, O-L., Brito, A., Goswami, N., Camalier, C. R., Crowell, C.A., Dannhauer, M., D'Arbeloff, T., Hamdan, R., Palmer, H., Liu, S., & Wang, F., Impact of Timing, Targeting, and Brain State on rTMS of Human and Non-Human Primates. (2020) BRAIN Initiative Investigators Meeting, June 2020, Washington DC.
34. Neacsiu, A.D., Beynel, L., Szabo, S.A, Appelbaum, L., Smoski, M., & LaBar, K. (2020). Establishing a Neural Target for Neuromodulation Enhanced Cognitive Therapy for Transdiagnostic Emotion Dysregulation. Poster to be presented at the presented at the 51st annual convention of the Society of Biological Psychiatry. New York, NY. (Conference Canceled due to COVID).
35. Vander Vegt CB, Appelbaum LG, Mihalik JP, Guskiewicz KM, Register-Mihalik JK. Pupillary Responses Indicate Working Memory Processing Differences: Implications For Healthy And Clinical Populations. ACSM, San Francisco, CA May 2020
36. Vander Vegt CB, Appelbaum LG, Mihalik JP, Guskiewicz KM, Register-Mihalik JK. Pupillary Responses Indicate Neurocognitive Processing Differences in Working Memory Following Concussion. NATA, Atlanta, GA June 2020

## 2019

37. Young, J. R., Smani, S. A., & Appelbaum L.G. (2019, October). Non-Invasive Brain Stimulation (NIBS) modalities for the treatment of Opioid Use Disorder (OUD): a qualitative review of the literature. Poster presented at the Addiction Medicine Essentials Conference, Durham, NC
38. Beynel, L., Davis, S.W., Crowell, C.A., Hilbig, S.A., Palmer, H., Brito, A., Hile, C., Lim, W., Nguyen, D., Dannhauer, M., Peterchev, A.V., Cabeza, R., Lisanby, S.H., Lubner, B., & Appelbaum, L.G. (October 2019) Site-, timing-, and load-specific effects of online repetitive transcranial magnetic stimulation (RTMS) on working memory (WM). Special nanosymposium “The Use of Transcranial Magnetic Stimulation to Modulate Human Memory”, Society for Neuroscience, Chicago, Ill.
39. Ferris LM, Liu S., Hilbig S., Port N.L., Applebaum L.G. Enhancing Performance through Vision: Sports Vision Training in Collegiate Baseball Hitters. In: Military Health Systems Readiness Symposium; Kissimmee, FL: Kissimmee, FL; 2019.
40. Edmunds, F.R., Liu, S., Appelbaum, L.G. (2019, October) Predictive Assessments in Hitting Performance in Professional Baseball. Poster presentation at the 3rd World Congress of Optometry, Orlando, FL.
41. Beynel, L., Davis, S.W., Crowell, C.A., Dannhauer, M., Lim, W., Palmer, H., Hilbig, S.A., Brito, A., Hile, C., Lubner, B., Lisanby, S.H., Peterchev, A.V., Cabeza, R., Appelbaum, L.G. (2019). Testing the feasibility and efficacy of a new dosing approach for rTMS. Carolina Neurostimulation Conference, Chapel Hill, NC, USA.

42. Dannhauer, M., Gomez, L., Lim, W., Beynel, L., Crowell, C.A., Davis, S.W., Palmer, H., Hilbig, S.A., Brito, A., Hile, C., Lubner, B., Lisanby, S.H., Cabeza, R., Appelbaum, L.G., Peterchev, A.V. (2019). Computational approaches for targeting brain areas in transcranial magnetic stimulation to brain areas across subjects. Carolina Neurostimulation Conference, Chapel Hill, NC, USA.
43. Gamboa, OL, Camalier, C. R., Dannhauer, M., Hamdan R., Connor Hile, C., Crowell, C., Wing, E., Beynel, L., Hilbig, S. A., Palmer, H., Wang, F., Appelbaum, L.G, Roberto Cabeza, R., Davis, S.W., Peterchev, A., Sommer, M. Impact of timing, targeting, and brain state on rTMS of human and non-human primates. (2019) Carolina Neurostimulation Conference, June 2019, Chapel Hill, NC.
44. Crowell, C.A., Beynel, L., Palmer, H., Hilbig, S.A., Brito, A., Lubner, B., Lisanby, S.H., Peterchev, A.V., Appelbaum, L.G., Cabeza, R., & Davis, S.W., (2019). Connectivity-based predictions of age-related response to rTMS. Carolina Neurostimulation Conference, Chapel Hill, NC, USA.
45. Sommer, M., Appelbaum, L.G., Cabeza, R., Davis, S., Peterchev, A., Gamboa-Arana, O-L., Brito, A., Camalier, C. R., Crowell, C.A., Dannhauer, M., D'Arbeloff, T., Hamdan, R., Hile, C., Hilbig, S., Palmer, H., & Wang, F., Impact of Timing, Targeting, and Brain State on rTMS of Human and Non-Human Primates. (2019) BRAIN Initiative Investigators Meeting, April 2019, Washington DC.
46. Liu, S., Folstein, J. R., Appelbaum, L. G., & Tenenbaum, G. (2019, June). Time, control strategy, and working memory capacity affect thinking a recalled experience of choking under pressure in student athletes. Presentation at the annual conference of the North American Society for the Psychology of Sport and Physical Activity (NASPSPA), Baltimore, MD.
47. Appelbaum, L.G., (2018) Sports Vision Training: A Research Perspective. Presented at the International Sports Vision Association Feb 10, 2019. Park City, UT.
48. Beynel, L., Appelbaum, L.G., Lubner, B., Crowell, C.A., Hilbig, S., Lim, W., Nguyen, D., Chrapliwy, N., Davis, S.W., Cabeza, R., Lisanby, S.H., & Deng, Z.D. (2019) Effects of online repetitive transcranial magnetic stimulation (rTMS) on cognition: a meta-analysis and recommendations for future studies. 3rd International Brain Stimulation Conference, Vancouver.
49. Beynel, L., Davis, S.W., Crowell, C.A., Hilbig, S., Palmer, H., Brito, A., Hile, C., Lim, W., Nguyen, D., Dannhauer, M., Peterchev, A.V., Cabeza, R., Lisanby, S.H., Lubner, B., Appelbaum, L.G. (2019). Site-specific effects of online repetitive transcranial magnetic stimulation (rTMS) on working memory (WM). 3rd International Brain Stimulation Conference, Vancouver.

## 2018

50. Appelbaum, L.G., Deng, Z-D, Palmer, H., Beynel, L., Watts, A., Young, J.R., Lisanby, S.H., Migaly, J. & Cox, M.L., (2018) Transcranial Direct Current Stimulation to Enhance Laparoscopic Technical Skill Learning: A Preregistered Randomized Controlled Trial. NYC Neuromodulation Conference & NANS Summer Seminar Series, New York, NY.
51. Crowell, C.A., Davis, S.W., Beynel, L., Lakhiani D., Hillbig, S.A., Brito, A., Palmer, H., Peterchev, A. V., Lubner, B., Lisanby, S.H., Appelbaum, L.G., Cabeza, R. Older adults benefit from more widespread network integration during working memory functioning. Society for Neuroscience, 2018, "Human Cognition and Behavior: Working Memory II" Nanosymposium.
52. Beynel, L., Deng, L., Crowell, C.A., Hilbig, S.A., Brito, A., Palmer, H., Lim, W., Peterchev, A.V., Lubner, B., Lisanby, S.H., Cabeza, R., Appelbaum, L.G., & Davis, S.W. (2018). Network controllability predicts rTMS-induced benefits to working memory ability. Society for Neuroscience, San Diego.
53. Beynel, L., Davis, S.W., Crowell, C.A., Hilbig, S.A., Lim, W., Palmer, H., Brito, A., Peterchev, A.V., Lubner, B., Lisanby, S.H., Cabeza, R., & Appelbaum, L.G. (2018). 5Hz repetitive transcranial magnetic stimulation to enhance working memory and neural factors underlying the rTMS-induced behavioral plasticity in old and young adults. Society for Neuroscience, San Diego.
54. Beynel, L., Davis, S.W., Crowell, C.A., Hilbig, S.A., Lim, W., Palmer, H., Brito, A., Peterchev, A.V., Lisanby, S.H., Cabeza, R., Appelbaum, L.G., & Lubner, B. (2018). Online repetitive transcranial magnetic



stimulation enhances working memory performance in younger and older adults. American College of NeuroPsychoPharmacology Conference, Florida.

55. Cox, M.L., Deng, Z-D, Palmer, H., Watts, A., Beynel, L., Young, J.R., Migaly, J. & Appelbaum, L.G., (2018) tDCS accelerates learning of laparoscopic surgical skills in a pre-registered, double-blind, randomized control design. Carolina Neurostimulation Conference, Chapel Hill, NC.
56. Brito, A., Abzug, Z., D'Arbeloff, T., Arana, O.L.G., Beynel, L., Crowell, C., Dannhauer, M., Hamdan, R., Hilbig, S.A., Palmer, H., Wing, E.A., Sommer, M., Cabeza, R., Davis, S.W., Peterchev, A.V., & Appelbaum, L.G. (2018) Online Paired-Pulse Transcranial Magnetic Stimulation (TMS) Alters Motion Perception in an Individually-Titrated Motion Discrimination Task. Carolina Neurostimulation Conference, Chapel Hill, NC.
57. Beynel, L., Appelbaum, L.G. Lubner, B., Crowell, C.A.C., Hilbig, S.A., Lim, W., Nguyen, D., Chrapliwy, N., Davis, S.W., Cabeza, R., Deng, Z.-D. (2018). Effects of online repetitive transcranial magnetic stimulation on cognitive processes: a meta-analysis. Carolina Neurostimulation Conference, Chapel Hill, NC.
58. Burris, K & Appelbaum, L.G. (2018) Eye on the ball: the relationship between sensorimotor abilities and on-field performance in professional baseball. MIT Sloan Sports Analytics, Boston MA. \*Research paper competition finalist.
59. Cox, M. L., Palmer, H., Watts, A., Beynel, L., Deng, Z.-D., Migaly, J., & Appelbaum, L. G. (2018). Utilizing Brain Stimulation to Enhance Laparoscopic Technical Skills Training: A Randomized Controlled Trial. Paper presented at the American College of Surgeons, Surgical Simulation Summit, Chicago, IL.
60. Teel EF, Register-Mihalik JK, Appelbaum LG, Battaglini CL, Carneiro KA, Guskiewicz KM, Marshall SP, & Mihalik JP (2018, June). The Effect of a Brief Aerobic Training Program on Concussion-Like Symptoms in Healthy University Students. To be presented at the National Athletic Trainer's Association Annual Meeting, New Orleans, Louisiana.
61. Sommer, M., Davis, S., Appelbaum, L.G., Cabeza, R., Peterchev, A., Beynel, L., Hamdan, R., Wing, E., & Abzug Z., Impact of Timing, Targeting, and Brain State on rTMS of Human and Non-Human Primates. (2018) BRAIN Initiative Investigators Meeting, April 2018, Washington DC
62. Appelbaum, L.G., Clements, J., Kirsch, E., Rao, H., Potter, N., Kopper, R. & Sommer, M. Psychophysiology of Visual-Motor Learning during a Simulated Marksmanship Task in Immersive Virtual Reality. (2018) Vision Science Society Annual Meeting, St. Pete Beach, FL.
63. Appelbaum, L.G., Visual hardware or software? What is the root of perceptual expertise in elite athletes, and can it be trained? (2018) presented at the International Sports Vision Association Feb 9, 2018. Park City, UT.
64. Teel, E.F., Register-Mihalik, J.K., Appelbaum, L.G., Battaglini, C.L., Carneiro, K.A., Guskiewicz, K.M., Marshall, S.P., Mihalik, J.P. The Effect of a Brief Aerobic Training Program on Concussion-Like Symptoms in Healthy University Students. (2018) National Athletic Trainers' Association, New Orleans, LA.

## 2017

65. Beynel, L., Davis, S.W., Crowell, C., Hilbig, S.A., Lim, W., Nguyen, D., Peterchev, A.V., Lisanby, S.H., Cabeza, R., Appelbaum, L.G., Lubner, B. (2017) fMRI- and computationally-guided rTMS enhances performance in working memory manipulation. Presented at the 56th annual meeting of the American College of Neuropsychopharmacology.
66. Hilbig, S, Appelbaum, L.G., Jangraw, D, Harrison, A, Jones, T, Sajda, P, Lisanby, S.H., Lubner, B. TMS selectively modulates cortical networks underlying perceptual decision making (2017). Human Brain Mapping conference.

67. Crowell, C., Davis, S.W., Beynel, L., Hilbig, S. Peterchev, A.V., Lubner, B., Lisanby, S.H., Appelbaum, L.G., Cabeza, R. Dissociating maintenance and manipulation operations in working memory. (2017) Human Brain Mapping conference.
68. Beynel, L., Davis, S.W., Crowell, C., Hilbig, S.H., Lim, W., Nguyen, D., Peterchev, A.V., Lubner, B., Lisanby, S.H., Cabeza, R., Appelbaum, L.G. Neuroimaging factors predicting benefits in working memory accuracy associated with rTMS. (2017) Human Brain Mapping conference, Vancouver Canada.
69. Appelbaum, L.G., Clements J, Rao HM, Khanna R, Zielinski DJ, Lu Y, Vittatoe K, Potter ND, Kopper R, Sommer MA. Changes in EEG and movement kinematics accompany sensorimotor learning in immersive virtual reality. 2017, 24th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA.
70. Lubner, B., Appelbaum, L.G., Beynel, L., & Lisanby, S.H. Individualized alpha-band rTMS to the inferior frontal junction selectively enhances visual search performance. 2017, 24th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA.

## 2016

71. Appelbaum, L.G., Clements, J., Lu, Y., Rao, H.M., Khanna, R., Zielinski, D.J., Vittatoe, K., Potter, N.D., Kopper, R., and Sommer, M.A. (November 2016). Sensorimotor orienting in immersive virtual reality: EEG correlates of skill learning. Society for Neuroscience, San Diego, CA.
72. Rao, H.M., Khanna, R., Zielinski, D.J., Lu, Y., Potter, N.D., Kopper, R., Sommer, M.A., and Appelbaum, L.G. (November 2016). Sensorimotor learning during a marksmanship task in immersive virtual reality. Society for Neuroscience, San Diego, CA.
73. Zielinski, D., Rao, H.M., Potter, N., Appelbaum, L.G., and Kopper, R. (March, 2016). Evaluating the effects of image persistence on dynamic target acquisition in low frame rate virtual environments. In IEEE Symposium on 3D User Interfaces. Greenville South Carolina. Honorable Mention for Best Poster Award
74. Sakraney, N., Morgan, J., Huettel, S.A., Moody, J., & Appelbaum, L.G. (April, 2016) The Semantics of Cognitive Neuroscience: Mapping Structure and Evolution. Cognitive Neuroscience Society. New York.
75. Morgan, J., Sakraney, N., Moody, J., Huettel, S.A., & Appelbaum, L.G. (April, 2016) Bridges and Communities: The Impact of Shared Concepts in Cognitive Neuroscience. Cognitive Neuroscience Society. New York.
76. Ruzic, L., Ngo, L., Appelbaum, L.G., De Brigard, F., & Huettel, S.A. (April, 2016) The neural components of cognition. Rethinking the Taxonomy of Psychology Conference. Rotman Annual Conference, Ontario, CA

## 2015

77. Appelbaum, L.G. (June, 2015) Neuro rhetoric: Mapping the semantic evolution of cognitive neuroscience. Society for Philosophy and Psychology. Durham NC.
78. Teel, E.F., Lynall, R.C., Appelbaum, L.G., & Mihalik, J.P., (June, 2015) The Effect of Sex, Sport, and Concussion History on Vision and Sensorimotor Performance in Healthy College Athletes. National Athletic Trainers' Association, St. Louis, MO.

## 2014

79. van den Berg, B., Appelbaum, L.G., Clark, K., Mitroff, S.R., & Woldorff, M.G. (November 2014). The neural cascade of processing underlying response time variability in visual search. Society for Neuroscience, Washington D.C.

## 2013

80. Appelbaum, L.G., Bel-Bahar, T., Wang, L., Krasich, K., Hughes, L. & Mitroff, S.R. (November 2013). Mapping the Core Factors of Visual Perceptual Performance. Psychonomic Society, Toronto CA.

81. Bel-Bahar, T., Gentzler, E., Adamo, S., Wang, L., Krasich, K., Hughes, L. Mitroff, S.R., & Appelbaum, L.G., (November 2013). Visualmotor performance is predicted by ERP amplitudes in a rapid serial visual presentation (RSVP) protocol. Psychonomic Society, Toronto CA.
82. Krasich, K., Hughes, L., Wang, L., Bel-Bahar, T., Mitroff, S.R., & Appelbaum, L.G., (November 2013). Visual Perception and Motor Skills Across the Day. Psychonomic Society Satellite – Objects, Perception, Attention, and Motion. Toronto CA.
83. Appelbaum, L.G., Cain, M.S., Schroeder, J.E., Darling, E.F., & Mitroff, S.R. (May, 2013). Improving visual cognition through stroboscopic training. Vision Sciences Society, Naples, FL.
84. Devyatko, D., Appelbaum, L.G., & Mitroff, S.R. (May, 2013). A common mechanism for perceptual reversals in motion-induced blindness, the Troxler effect, and perceptual filling-in. Vision Sciences Society, Naples, FL.
85. Appelbaum, L.G., Beam, E., Jack, J., Moody, J., & Huettel, S.A. (April, 2013). NeuroRhetoric: Mapping the Semantic Structure of Cognitive Neuroscience. Cognitive Neuroscience Society. San Francisco, CA.
86. Donohue, S.E., Appelbaum, L.G. & Woldorff, M.G. (April, 2013). The Effects of Response Number and Task on the Electrophysiological Correlates of Conflict Processing. Cognitive Neuroscience Society. San Francisco, CA.
87. San Martín, R., Appelbaum, L.G. Huettel, S.A., & Woldorff, M.G. (April, 2013). Neural signatures of value-driven attentional capture predict individual differences in economic choice. Cognitive Neuroscience Society. San Francisco, CA.

## 2012

88. Appelbaum, L.G., Clark, K., Mitroff, S.R., & Woldorff, M.G. (October 2012). Cognitive and Neural Plasticity due to Visual Search Training. Society for Neuroscience, New Orleans, LA.
89. Krebs, R., Boehler, C.N., Appelbaum, L.G. & Woldorff, M.G. (May 2012). Reward increases early attentional control in the Stroop task and modulates interference-related ERP components. European Society for Cognitive and Affective Neuroscience. Marseille, France.
90. Clark, K., Appelbaum, L.G., Mitroff, S.R., & Woldorff, M.G. (May 2012). Neural correlates of learning during a visual search task. Vision Sciences Society, Naples, FL.
91. Appelbaum, L.G., Boehler, C.N., & Woldorff, M.G. (April 2012). Proactive and reactive cognitive control in the human brain. Cognitive Neuroscience Society. Chicago, IL.

## 2011

92. Beam, E., Appelbaum, L.G., Jack, J., Moody, J., & Huettel, S.A. (November, 2011). Mapping the Intrinsic Structure of Cognitive Neuroscience. Society for Neuroscience, Washington, D.C.
93. San Martín, R., Appelbaum, L.G., Pearson, J.M., Huettel, S.A., & Woldorff, M.G. (November, 2011). Feedback-related activity predicts individual differences in Gain maximizing and Loss minimizing in a probabilistic decision-making task. Society for Neuroscience, Washington, D.C.
94. Mitroff, S.R., Appelbaum, L.G., Schroder, B, J., & Cain, M.S. (November 2011). Improved Visual Cognition Through Stroboscopic Training. Annual Meeting of the Psychonomic Society, Seattle, WA.
95. Appelbaum, L.G., Boehler, C.N., Won, R., Davis, L., & Woldorff, M.G. (April 2011). Strategic orientation of attention reduces temporally predictable stimulus conflict. Cognitive Neuroscience Society, San Francisco, CA.
96. Schroder, B, J., Appelbaum, L.G., Cain, M.S., & Mitroff, S.R. (May, 2011). Examining the Effects of Stroboscopic Vision. Vision Science Society, Naples, FL.
97. Appelbaum, L.G., Chen, W.D., Smith, D.S. Boehler, C.N., Woldorff, M.G. (November, 2011). Functional dynamics of stimulus conflict resolution in the human brain. Society for Neuroscience, San Diego, CA.

## 2010 and earlier

98. Appelbaum, L.G., Boehler, C.N., Woldorff, M.G. (April, 2010). Priming and backward interference in the human brain: stimulus onset asynchrony manipulations reveal processing interactions during the Stroop and reverse Stroop tasks. Cognitive Neuroscience Society, Montreal, Canada.
99. Boehler, C. N., Appelbaum, L.G., Krebs, R. M., Hopf, J.M., & Woldorff, M.G. (April, 2010). Pinning down response inhibition in the brain - conjunction analyses of the Stop-signal task. Cognitive Neuroscience Society, Montreal, Canada.
100. Ales, J., Appelbaum, L.G., Norcia, A.M. (May, 2010). Neural signatures of shape discrimination decisions at threshold. Vision Science Society, Naples, FL.
101. Appelbaum, L.G., Chen, W.D., Meyerhoff, K., Davis, L.A., Won, R.J., Woldorff, M.G. (May, 2009). Priming and backward interference in the human brain: SOA manipulations reveal processing interactions during the Stroop and reverse Stroop tasks. Vision Science Society, Naples FL.
102. Appelbaum, L.G., Meyerhoff, K., Chen, W.D., Woldorff, M.G. (October, 2008). Automaticity and information integration in the human brain: EEG insights from SOA variants of the Stroop and reverse Stroop tasks. Optical Society of America, Fall Vision Meeting, Rochester NY.
103. Meyerhoff, K.L., Appelbaum, L.G., and Woldorff, M.W. (April, 2008). The Temporal Sensitivity of the Stroop Color-Word Interference Effect. Cognitive Neuroscience Society, San Francisco, CA.
104. Appelbaum, L.G., Vildavski, V.Y., Pettet, M.W., Wade, A.R., & Norcia, A.M. (November, 2007). Voluntary attention: the influence of feedback on figural processing." Society for Neuroscience, San Diego, CA.
105. Norcia, A.M., Appelbaum, L.G., Pettet, M.W., Vildavski, V.Y., & Wade, A.R. (November, 2007). Neural correlates of temporal attention: anticipatory responses in the human visual cortex to periodic stimuli." Society for Neuroscience, San Diego, CA.
106. Palomares, M., Norcia, A.M., Wade, A.R., Pettet, M.W., Vildavski, V.Y., Appelbaum, L.G. (October, 2007). On the differences and similarities between real and implied motion: a high-density EEG study. Optical Society of America, Fall Vision Meeting, Berkeley, CA.
107. McKee, S., Wade, A.R., Pettet, M.W., Vildavski, V.Y., Appelbaum, L.G., Norcia, A.M. (October, 2007). Disparity processing in the human brain imaged with high density EEG. Optical Society of America, Fall Vision Meeting, Berkeley, CA.
108. Appelbaum, L.G., Vildavski, V.Y., Pettet, M.W., Wade, A.R., & Norcia, A.M. (May, 2007). Neural dynamics of visual scene segmentation. Vision Science Society, Sarasota FL.
109. Norcia, A.M., Wade, A.R., Pettet, M.W., Vildavski, V. and Appelbaum, L.G. (February, 2007). Periodic Visual Stimuli Lead to Anticipatory Responses in Human Prefrontal and Occipital Cortex: Results from EEG Source Imaging. Annual Interdisciplinary Conference, Jackson, WY.
110. Norcia, A.M., Wade, A.R., Vildavski, V.Y., Pettet, M.W., Appelbaum, L.G. (August, 2007). "Anticipatory responses in human visual cortex to predictable stimuli: An EEG source-imaging study. Perception 36. European Conference on Visual Perception.
111. Appelbaum, L.G., Pettet, M.W., Vildavski, V., Wade, A., Norcia, A.M. (February, 2006). Cue-invariant Networks for Figure and Background Processing in Human Visual Cortex. Annual Interdisciplinary Conference, Jackson, WY.
112. Appelbaum, L.G., Pettet, M.W., Vildavski, V., Wade, A., Norcia, A.M. (November, 2006). Cortical networks underlying visual scene segmentation. Society for Neuroscience, Atlanta GA.
113. Appelbaum, L.G., Vildavski, V.Y., Pettet, M.W., Wade, A.R., & Norcia, A.M. (October, 2006). Dynamics of scene segmentation: The role of boundary information. Journal of Vision, 6(13):42. Optical Society of America, Fall Vision Meeting, Rochester NY.

114. Norcia, A.M., Pettet, M.W., Vildavski, V.Y., Wade, A.R., & Appelbaum, L.G. (October, 2006). Regions of human visual cortex sensitive to small vernier offsets as determined by EEG source-imaging. *Journal of Vision*, 6(13):21. Optical Society of America, Fall Vision Meeting, Rochester, NY.
115. Appelbaum, L.G., Vildavski, V.Y., Pettet, M. W., Wade, A. R., & Norcia, A. M. (May, 2006). Cortical networks underlying scene segmentation. *Journal of Vision*, 6(6):475. Vision Science Society, Sarasota, FL.
116. Norcia, A.M., Han, Y., Pettet, M.W., Vildavski, V.Y., Wade, A.R., & Appelbaum, L.G. (May, 2006). Modulation of local and global motion responses by sustained visual attention.” *Journal of Vision*, 6(6):588. Vision Science Society, Sarasota, FL.
117. Appelbaum, L.G., Wade, A.R., Pettet, M., Vildavski, V., & Norcia, A. M. (October, 2005). Dynamics of texture segmentation.” *Journal of Vision*, 5(12):12. Optical Society of America, Fall Vision Meeting, Tempe AZ.
118. Sperling, G., Appelbaum, L.G., & Lu, Z-L. (August, 2005). Amplifying the effective perceptual contrast of a grating.” *Perception* 34. European Conference on Visual Perception, Coruna, SP.
119. Hou, C., Pettet, M., Vildavski, V., Appelbaum, L.G., & Norcia, T. (May, 2005). The Temporal Order of Border and Surface Processing: Illusory Contours and Salient Regions. Association of Research in Vision and Ophthalmology, Ft. Lauderdale, FL.
120. Appelbaum, L.G., Lu, Z-L., & Sperling, G. (May, 2005). Neuromagnetic responses to first- and second-order motion. *Journal of Vision*, 5(8):926. Vision Science Society, Sarasota, FL.
121. Appelbaum, L.G., Pettet, M.W., Vildavski, V., Wade, A., Norcia, A.M. (November, 2005). Dynamics of Texture Segmentation. Society for Neuroscience, Washington, DC.
122. Appelbaum, L.G. and Srinivasan, R. (November, 2003). Neural Correlates of Figure-Ground Segregation during Bistable Perception of the Rubin Face-Vase Illusion.” Society for Neuroscience, New Orleans, LA.
123. Appelbaum, L.G., Lu, Z-L., & Sperling, G. (January, 2002). Amplifying Contrast: Example from Motion and Texture. Annual Interdisciplinary Conference, Jackson, WY.
124. Appelbaum, L.G., Lu, Z-L., & Sperling, G., (May, 2001). Contrast Amplification in a Texture Discrimination Task.” Association of Research in Vision and Ophthalmology, Ft. Lauderdale, FL.
125. Appelbaum, L.G., Lu, Z-L., & Sperling, G. (October, 2001). Facilitation of Subthreshold Contrasts by Means of Texture-Slant Discrimination.” Optical Society of America, Fall Vision Meeting, Irvine, CA.
126. Adamson, A. Mills, D. and Appelbaum, L.G. (April, 1999). Sentence Processing in Adults and Children: Evidence from ERPs. Cognitive Neuroscience Society, San Francisco, CA.
127. Mervis, C.B., Klein, B.P., Bertrand, J., Kwitny, S., & Appelbaum, L.G., (April, 1998). Attention to faces in infancy: Comparison of an infant with Williams syndrome to typically developing infants.” 11th International conference on infant studies, Atlanta, GA.

## **Teaching**

### **Instructor of Record Undergraduate Courses**

Neuroplasticity and Expertise (Psych/Neuro 351)	Duke University	2016, Spring
Neural Basis of Cognitive Plasticity (Psych/Neuro 290)	Duke University	2015, Spring
Neural Basis of Cognitive Plasticity (Psych/Neuro 290)	Duke University	2012, Spring
Introduction to Cognitive Psychology (Psych 230)	UNC, Chapel Hill	2008, Summer
Introduction to Cognitive Psychology (Psych 230)	UNC, Chapel Hill	2008, Spring
Sensation and Perception (Psych 225)	UNC, Chapel Hill	2007, Summer
Biological Psychology (Psych 498)	San Francisco State University	2006, Fall
Biological Psychology (Psych 498)	San Francisco State University	2006, Spring

Learning and Memory (Psych 491)	San Francisco State University	2005, Spring
Cognitive Neuroscience (Psych 160)	University of California, Irvine	2004, Summer

### **Team Taught Graduate Courses**

NEU 200C Cognitive Neuroscience	UCSD	2023, 2024, Spring
Principles in Cognitive Neuroscience	Duke University	Annually 2009-2020
Neuroscience Bootcamp (TMS Methods)	Duke University	Annually 2017-2020
Advanced fMRI Methods	Duke University	2010 - 2012

### **Fellowship Courses**

Visiting Fellowship in Transcranial Magnetic Stimulation (4 CME hours)	Duke University SOM	Quarterly 2017-21
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### **Continuing Medical Education Courses**

Council on Optometric Practitioner Education. Research Review (1 CME hour 75835-FV)	ISVA Conference	2019, 2020, 2022
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## **Research Supervision**

### **Supervised Mentee Research Fellowships and Awards:**

- 2024 JDP Best Student Article awarded to Ms. Lindsay Benster
- 2024 Neuroscience Graduate Program Community Leadership Award to Ms. Louise Stolz
- 2024 Society for Biological Psychiatry conference travel award to Mr. Noah Stapper
- 2023 McNair Scholars Fellowship at UCSD – Awarded to Mr. Jaden Huynh
- 2022 SDSU University Graduate Fellowship (\$30,000) – Awarded to Lindsay Benster
- 2021 VA Career Development Award - Awarded to Dr. Jonathan Young
- 2020 Duke Rhodes Information Initiative DATA+ program lead
- 2020 American Society of Clinical Psychopharmacology, Early Career Research Award - Dr. Jonathan Young
- 2020 Chair's Choice Travel Award, Society of Biological Psychiatry – Awarded to Dr. Jonathan Young
- 2019 NIH K99/R01 Award (mentoring consultant) – Awarded to Dr. Luis Gomez
- 2019 Summer Neuroscience Program fellowship - Awarded to Mr. Edem Asamoah
- 2019 Stanford University Research Conference Travel Award – Awarded to Joyce Wang
- 2018 Duke University Psychology and Neuroscience Travel Award – Awarded to Joyce Wang
- 2018 DIBS Germinator Award – Awarded to Dr. Lysianne Beynel
- 2018 Duke Undergraduate Research Office Travel Award – Awarded to Ms. Sade Abiodun
- 2018 IEEE Doctoral Consortium Travel Award - Awarded to Ms. Jillian Clements
- 2017 Summer Neuroscience Program fellowship - Awarded to Ms. Elayna Kirsch
- 2016 Duke Undergraduate Research Office Travel Award – Awarded to Ms. Natasha Sakraney
- 2016 Duke Neuroscience Program in Research - Awarded to Ms. Kelly Vittetoe
- 2016 – 2018 Duke BioCoRE Fellowship – Awarded to Ms. Amanda Watts
- 2015 Pitzer College Summer Research Fellowship - Awarded to Ms. Sage Lachman
- 2013 Duke Student Science Education Outreach Grant - Awarded to Mr. Jonathan Winkle & Ms. Pinar Yoldas
- 2013 Duke Psychology Vertical Integration Program - Awarded to Ms. Clara Colombatto and Ms. Kait Clark
- 2013 Duke Neuroscience Student Research Award to Ms. Eliza Gentzler and Mr. Stephen Adamo

## Faculty

Cory Weissman, MD PhD	UCSD Psychiatry	2024 -	NIH K32 Award
Jonathan Young, MD	Durham VA	2021 – 2024	VA CDA 1 and 2
Noreen Bukhari-Parlakturk, MD PhD	Duke Neurology	2018 – 2021	KL2 Career Development
Andrada Neacsiu, Ph.D.	Duke Psychiatry	2017 – 2020	KL2 Career Development
Andrada Neacsiu, Ph.D.	Duke Psychiatry	2016 – 2018	NARSAD Young Investigator

## Research Scientist

Yinming Sun, PhD	UCSD Psychiatry	2023 –
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## Project Scientist

Jordan Kohn	UCSD Psychiatry	2023 –
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## Postdoctoral Fellows

Mohsen Poorganji	UCSD Psychiatry	2023 –
Sicong (“Zone”) Liu, PhD	Duke Psychiatry	2018 – 2021
Olga Lucia Gamboa Arana, PhD	Duke Psychiatry	2018 – 2019
Lysianne Beynel, PhD	Duke Psychiatry	2016 – 2020
Lingling Wang, PhD	Duke Psychiatry	2013 – 2014
Tarik Bel-Bahar, PhD	Duke Psychiatry	2012 – 2013

## Residents and Fellows

Federico Suprani	UCSD Psychiatry	2022 – 2023
Jonathan Young, MD (Psychiatry)	Duke Psychiatry	2016 – 2020
Morgan Cox, MD (Surgery)	Duke Surgery	2015 – 2018

## Ph.D. Theses

Louise Stolz	UCSD, Neuroscience Graduate Program	Class of 2025	Primary Advisor
Lindsay Benster	UCSD/SDSU Joint Doctoral Program	Class of 2026	Co-Primary Advisor
Emma Boyd	UCSD, Neuroscience Graduate Program	Class of 2025	Primary Advisor
Sydney Smith	UCSD, Cognitive Science	Class of 2024	Committee member
Andrew Bender	UCSD, Neuroscience	Class of 2025	Committee member
Quirine van Engen	UCSD, Cognitive Science	Class of 2025	Committee member
Joanna Eckhardt	UCSD, Neuroscience	Class of 2026	Committee member
Cynthia Nyongesa	UCSD, Neuroscience	Class of 2026	Committee member
Noah Stapper	UCSD/SDSU Joint Doctoral Program	Class of 2028	Committee member
Mohsen Poorganji	University of Toronto	Defended, 2022	External Appraiser
Jean-Philippe Miron	University of Toronto	Defended, 2022	External Appraiser
Christina Vander Vegt	UNC, Exercise Sports Sciences	Defended 2020	Committee member

Kyle Burris	Duke, Statistics	Defended, 2019	Committee member
Jillian Clements	Duke, Engineering	Defended, 2019	Co-Chair
Liz Teel	UNC, Exercise Sports Sciences	Defended, 2017	Committee member

### Medical Students

Kamryn Toney	UCSD Summer K25 Psychiatry Research Fellowship	Summer 2023	Co-supervisor
Chelsea Carter	UCSD Summer K25 Psychiatry Research Fellowship	Summer 2024	Co-supervisor
Brian Cui	UCSD Short-term Summer Research Training Program	Summer 2024	Co-supervisor
Miles Melamed	UCSD Medical School summer rotation	Summer 2024	Supervisor

### Master's Thesis

Taryn Gilrein	UNC Exercise Sports Sciences	Defended, 2014	Committee member
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### Graduate Practicum and Rotations

Can Ozger	Ph.D. Lab Rotation	UCSD	Fall 2024
Lora Khatib	Ph.D. Lab Rotation	UCSD	Spring 2023
Mohammad Shensa	MD. Independent Study Project	UCSD SOM	2022 - 2023
Miles Martinez	Ph.D. Practicum	Duke University	Spring, 2021
Tracy d'Arbaloff	Ph.D. Practicum	Duke University	Spring, 2018
Lifu Deng	Ph.D. Lab Rotation	Duke University	Spring, 2018
Matthew DeLang	DPT Lab Rotation	Duke University	2016 - 2017

### Undergraduate Honors Thesis Supervision

Jaden Huynh (UCSD)	Defended, May 2023	Primary advisor
Ashwin Subramaniam (Duke)	Defended, April 2022	Primary advisor
Edem Asamoah (Duke)	Defended, April 2021	Primary advisor
Erikson Nichols (Duke)	Defended, April 2020	Primary advisor
Rachel Donaldson (Duke)	Defended, April 2020	Primary advisor
Joyce Wang (Duke)	Defended, April 2019	Primary advisor
Elayna Kirsch (Duke)	Defended, April 2018	Primary advisor
Jordan Cohen (Duke)	Defended, April 2017	Committee member
McKenzie Middlebrooks (Duke)	Defended, April 2017	Committee member
Natasha Sakraney (Duke)	Defended, April 2016	Primary advisor
Yvonne Lu (Duke)	Defended, April 2016	Primary advisor
Annie Apple (Duke)	Defended, April 2016	Primary advisor
Garland Austin (Duke)	Defended, April 2016	Primary advisor
Peter Cangialosi (Duke)	Defended, April 2016	Committee member
Delaney Lagrew (Duke)	Defended, April 2016	Committee member
Sheetal Hedge (Duke)	Defended, April 2015	Committee member
April Ratliff (Duke)	Defended, April 2015	Committee member



Daniela De Albuquerque (Duke)	Defended, April 2015	Committee member
Eliza Gentzler (Duke)	Defended, April 2014	Primary advisor
Christopher Mazis (Duke)	Defended, April 2014	Committee member
Elizabeth Beam (Duke)	Defended, April 2013	Committee member

## Undergraduate Student Mentoring

### UCSD

Erin Wilbanks	Summer 2024		
Vidhi Oswal	2024	Aashi Patel	2024
Rodeen Ahghari	2023 – present	Vanessa Tello	2023 – present
Tianli Jiang	2022 – 2023	Jaden Huynh	2022 – 2023
Ted Feng	2021 – 2023	Shelby Bruneniaks	2021 – 2022
Leo Feng	2022 – 2024	Jordan Baker	2021 – 2022

### Duke University

Shailen Parmar	2019 – 2020	Garland Austin	2015 – 2016
Jessica Ho	2019 – 2022	Chrislyn Choo	2014 – 2015
J.T. Gala	2019 – 2021	Sheetal Hedge	2014 – 2015
Ashwin Subramaniam	2019 – 2022	Natasha Sakraney	2014 – 2016
Angikar Ghosal	2019 – 2020	Kelly Vittetoe	2014 – 2017
Erikson Nichols	2018 – 2020	Rajan Khanna	2014 – 2017
Edem Asamoah	2018 – 2021	Clara Colombatto	2013
Rachel Donaldson	2017 – 2020	Annie Apple	2013 – 2016
Maria Naclerio	2017 – 2020	Ben Ramger	2013 – 2016
Elayna Kirsch	2016 – 2018	Laura Holton	2013 – 2016
Amanda Watts	2016 – 2018	Yvonne Lu	2013 – 2016
Wesley Lim	2016 – 2018	Eliza Gentzler	2013 – 2014
Joyce Wang	2015 – 2019	Floyd Wilks	2013 – 2014
Eliane Schinder	2015 – 2016	Gabriela Asturias	2013 – 2014

## Clinical Research Managers

Jessica Rico	UCSD Psychiatry	2022 – 2024
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## Clinical Research Coordinators

Hadley Daniels	UCSD Psychiatry	2023 – present
Felix Angulo	UCSD Psychiatry	2023 – present
Jashell Smith	UCSD Psychiatry	2023 – present
Katie Rodrigues	UCSD Psychiatry	2022 – present
Karina Banks	UCSD Psychiatry	2022 – present
Bianca Bacio	UCSD Psychiatry	2022 – present
Katherine Crouthamel	UCSD Psychiatry	2022 – 2024
Caroline Huang	UCSD Psychiatry	2023 – 2024
Ringo Leung	UCSD Psychiatry	2022 – 2023
Alexander Wen	UCSD Psychiatry	2022 – 2022

Liam Lochhead	UCSD Psychiatry	2021 – present
Eleanor Wood	Duke Psychiatry	2020 – 2021
Hannah Palmer	Duke Psychiatry	2017 – 2020
Susan Hilbig	Duke Psychiatry	2015 – 2020
Connor Hile	Duke Psychiatry	2018 – 2019
Alexandra Brito	Duke Psychiatry	2017 – 2018
Duy Nguyen	Duke Psychiatry	2016 – 2017
Courtney Crowell	Duke Psychiatry	2016 – 2019
Kristina Krasich	Duke Psychiatry	2012 – 2014
Lauren Hughes	Duke Psychiatry	2012 – 2013

### **Undergraduate Student Advising**

Undergraduate Neuroscience Major Advisor, Duke University Classes of 2015, 2016, 2017, 2018

### **Service**

#### **University Services**

UCSD, Faculty Athletic Advisory Board (FABA), 2022, 2023  
 UCSD Health Sciences Faculty Mentor Training Program (FMTP) – Workshop Leader, 2022-2025  
 Search Committee, Associate Dean of Education, Duke School of Medicine, 2019 – 2020

#### **Departmental/Program Services**

##### UCSD Psychiatry

Psychiatry, Internal FTE Committee, 2024  
 Psychiatry, Neuromodulation Search Committee, 2024  
 Psychiatry Faculty Open Search Committee, three-year term starting in 2023  
 Psychiatry Research Council, three-year term starting 2021

##### UCSD Neuroscience Graduate Program

Neuroscience Graduate Program Admissions Committee, 2021  
 Neuroscience Seminar Series Faculty Committee, 2023-2025  
 Neuroscience Graduate Program, Mock Study Section Reviewer, 2023

##### UCSD Keck Center for Functional magnetic Resonance Imaging (CFMRI)

CFMRI Strategic Planning Committee, 2024 - present

##### Duke

PhD Admission Committee, Duke Cognitive Neuroscience Admitting Program, 2020 – Present  
 Resident Interview Committee, Duke Psychiatry and Behavioral Sciences, 2019 – Present  
 Co-Chair, Duke Psychiatry and Behavioral Sciences Faculty Search Committee, 2018 – 2019  
 Duke University Center for Cognitive Neuroscience, Colloquium Organizer, 2012 – 2013 and 2017 – 2018

#### **Society, Conference, and Other Services**

Triangle Brain Stimulation Working Group, Organizer: Biannual symposium for brain stimulation at Duke, UNC, Wake Forest and surrounding universities. 2018 - 2021

Tenure Letter writer for Committee on Appointments and Promotions; 2022  
Conference Section Chair, Fall Vision Meeting - Optical Society of America, 2006-2009  
UC Irvine Neuroscience Symposium, Co-Chair, 2003

### **Data Safety Monitoring Board**

Data Safety Monitor – NIH 1R03HD094614-01A1 – “Realistic measurements of tDCS-modulated activity and electric fields in the human brain in vivo”, PI Pratik Chhatbar.

Data Safety Monitor – Industry Sponsored Trial – “Optimizing parameters of low intensity of focused ultrasound stimulation for stroke patients”, PI Wayne Feng.

## **Review Activities**

### **Grant Review**

NIMH Special Emphasis Panel/ Scientific Review Group 2022/10 ZRG1 BDCN-S(55)  
NIMH Special Emphasis Panel/ Scientific Review Group 2022/2 ZMH1 ERB-E(01)  
NIH Special Emphasis Panel/Scientific Review Group 2019/05 ZRG1 BBBP-X (02)  
NIH Special Emphasis Panel/Scientific Review Group 2017/05 ZRG1 BDCN-J (51)  
Army Research Office (2016, 2018, 2020)  
National Science Foundation, USA (2018)  
Netherlands Organisation for Scientific Research (2016)  
Manitoba Medical Service Foundation, Canada (2017)  
Ontario Physicians' Services Incorporated Foundation, Resident Research Award (2020)  
Duke BASS Connections reviewer (2015 and 2020)

### **Book Reviewer**

Cambridge University Press

### **Journal Review Board**

Brain Topography (2017-2021)  
Frontiers in Perception Science  
Frontiers in Cognitive Neuroscience

### **Guest Journal Editor**

Optometry and Vision Science - Feature Issue: “Visual Function and Sports Performance”  
Frontiers in Cognitive Neuroscience – Research Topic: “Neural Mechanisms of Perceptual-Cognitive Expertise in Elite Performers”

### **Ad hoc Journal Reviewer**

<b>Journal</b>	<b>Year at start of each review</b>
Acta Psychologica	2015
Annals of Biomedical Engineering	2020
Applied Neuropsychology: Adult	2023
BMC Neuroscience	2010
Brain and Behavior	2019

Brain Research	2011
Brain Sciences	2020
Brain Topography	2017
Clinical Neurophysiology	2022, 2023 (x2), 2024
Cognitive, Affective, & Behavioral Neuroscience	2013
Cortex	2014
Current Biology	2020
eNeuro	2019
Experimental Brain Research	2010
Frontiers in Human Neuroscience	2008, 2009, 2016
Human Brain Mapping	2009 (x2), 2011 (x2)
Human Movement Science	2021
International Journal of Sport and Exercise Psychology	2024
International Journal of Sports Physiology and Performance	2018
International Journal of Sports Science and Coaching	2018
International Review of Sports and Exercise Psychology	2019
Journal of Cognitive Enhancement	2017, 2019
Journal of Cognitive Neuroscience	2009, 2010, 2012, 2014, 2016
Journal of Neurophysiology	2007, 2009 (x2), 2012
Journal of Neuroscience	2009, 2011
Journal of Science and Medicine in Sports	2017, 2018, 2024
Journal of Sports and Exercise Psychology	2016 (x2), 2018, 2024
Journal of Science and Medicine in Sport (JSAMS Plus)	2022
Journal of Sports Science	2019, 2020
Journal of Vision	2010, 2011, 2014, 2015, 2017 (x2)
Medicine & Science in Sports & Exercise	2020
Motor Control	2016
NeuroImage	2016, 2024
Neuropsychologia	2012, 2013, 2014, 2020
Optometry and Vision Science	2024
Perceptual and Motor Skills	2014
Personality and Individual Differences	2016
PLoS One	2010, 2019
Proceedings of the National Academy of Science	2013
Psychophysiology	2022
Quest	2019
Scandinavian Journal of Medicine and Science in Sports	2021
Science Advances	2022
Scientific Reports	2016, 2017
Sport Sciences for Health	2019
Sports Medicine	2020
Sports Medicine - Open	2018

## **Scientific Outreach**

Member Wu-Tsai Human Performance Alliance, 2022 - present  
 Insights into Sports Vision newsletter: Sports Vision Research: Seeing Improvements  
[Perception and Action Podcast Guest](#), April 2020  
 BOOST: Building Opportunities & Overtures in Science & Technology, instructor, 2019  
 InnoJam: development program for URM in science. guest instructor, 2018, 2019  
 Summer Symposia in Neuroscience and Philosophy, instructor, 2016, 2017, 2018  
 Duke Accelerated STEM High School Program, instructor, 2016, 2017, 2018, 2019  
 Duke BioCoRE mentor, 2016, 2017, 2018  
 Duke Brain Bee, Shadow a Neuroscientist Volunteer, 2011, 2013, 2014, 2015, 2016  
 Duke University Outreach; Brain Awareness Week Organizer/Presenter, 2010, 2011, 2012, 2013, 2016  
 North Carolina Museum of Life and Science, Heroes and Villains Event Presenter, 2012  
 North Carolina Museum of Life and Science, BRAINS! Event Presenter, 2013  
 Carolina Science Café Presenter, 2013  
 North Carolina Science Festival, The Science of Sports Presenter, 2014, 2016

## **Professional Societies, Training and Certifications**

### **Professional Society Membership**

Sigma Xi	Member, 2002 – 2006
Vision Science Society	Member, 2004 – 2020
Society for Neuroscience	Member, 2005 – 2020
Optical Society of America	Member, 2005 – 2009
Cognitive Neuroscience Society	Member, 2009 – 2020
Psychonomic Society	Member, 2013 – 2015
International Sports Vision Association	Member, 2016 – Present
Organization for Human Brain Mapping	Member, 2017
American Psychological Association	Member, 2022 - 2023
Society for Biological Psychiatry	Member, 2023 - Present

### **Professional Training**

Center for the Improvement of Mentored Experiences in Research (CIMER), Facilitating Entering Mentoring Level 1 Trainer. Virtual, April 2022.

Senior Faculty Mentor Training 2021: Optimizing Health Sciences Faculty Mentoring Relationships at University of California, San Diego.

Health Sciences Faculty Search Committee Training for Inclusive Hiring (certification valid 2024-2027)

Visiting Fellowship in Transcranial Magnetic Stimulation – Duke University Medical Center, 2013

### **Certifications**

UCSD Keck CFMRI certified functional magnetic resonance imaging operator (2021 – present)

Basic Life Saving

U.S. Coast Guard - Operator Uninspected Passenger Vessel (OUPV) License

Nike SPARQ Sensory Performance Certified Trainer

NAUI Scuba Diving Instructor