

Curriculum Vitae
Lawrence Gregory Appelbaum
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Personal Information

Department of Psychiatry and Behavioral Science
Duke University Medical Center
54231 Duke Hospital South
400 Trent Dr., Box 3620
Durham, NC 27710

Phone: 919.613.7664
Fax: 919.681.0815
E-mail: greg@duke.edu
Website: www.dukeoptilab.org

Education

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

Academic and Professional Experience

Appointments

2017 – Present Associate Professor. Dept of Psychiatry and Behavioral Sciences, Duke University SoM, NC
Secondary Appointment, Department of Psychology & Neuroscience, Duke University, NC
Affiliate, Center for Cognitive Neuroscience, Duke University, NC
2011 – 2017 Assistant Professor. Dept of Psychiatry and Behavioral Sciences, Duke University SoM, 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
2004 – 2006 NSRA Postdoctoral Fellow. Smith-Kettlewell Eye Research Institute, San Francisco, CA

Center Directorships

2015 – Present Director, Brain Stimulation Research Center, Duke University School of Medicine

Research Laboratory

Head – Human Performance Optimization Laboratory (Opti Lab), Duke University School of Medicine

Other Professional Activities

2019 – Present Board of Directors, International Sports Vision Association
2018 – Present Consultant – RightEye LLC
2018 – Present Scientific Advisor – NeuroTrainer, LLC
2016 – Present Advisory Board – NeuroPlus, LLC

2015 – Present Founder and President – Psychometric Consulting, LLC,

Funding

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

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 July 31, 2021
Total funding: \$1,936,033 (department sub-award \$1,138,584)
Summary: This project will test neuronal dose-response relationships of rTMS in human and non-human primates.

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
Total funding: \$1,000,000
Summary: This project will develop TMS coils with improved depth-focality tradeoff

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 July 9, 2020
Total funding: \$920,725
Summary: This ARO proposal is investigate sensorimotor function in elite athletes and soldiers and relate this function to injury and achievement.

Title: Using fMRI-guided TMS to increase central executive function in older adults
Funding Source: National Institute of Aging [U01 AG050618]
Role: Co-PI (with Roberto Cabeza)
Grant Period: September 1, 2015 through March 31, 2020
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: Co-PI (with Roberto Cabeza)
Grant Period: June 15, 2019 through March 31, 2020
Total funding: \$379,688
Summary: This Administrative Supplement to our NIA U01 award extends fMRI-guided transcranial magnetic stimulation enhancement of working memory to adults with Mild Cognitive Impairments.

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, 2020
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: 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 is to develop test fMRI connectivity targeting of Transcranial Magnetic Stimulation to modulate Amygdala activity as a potential therapeutic for PTSD.

Completed Research Support

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 utilizes simultaneously recorded EEG & fMRI to study the mechanisms of multisensory attention.

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: This Duke University Institute for Brain Sciences Incubator award is to investigate the use of rTMS to change brain function and behaviors that could help support smoking cessation.

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 University Institute for Brain Sciences is to develop functional Near-Infrared Spectroscopy measures of 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 University Institute for Brain Sciences is to develop and apply 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) is 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 is to establish 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
Role: Sub-Contract PI (Project PI: Chris Johnson, NHRC)
Grant Period: May 1, 2014 through April 30, 2015
Sub-Contract: \$89,162
Summary: This grant (NHRC BAA 13-001) is to assess the efficacy of visual training techniques for improving shooting performance and sensorimotor abilities in special operations soldiers.

Title: Identifying, Assessing, and Enhancing Human Perceptual and Cognitive Abilities
Funding Source: DARPA: D12AP00025-002
Role: Co-PI (with Steve Mitroff)
Grant period: October 1, 2012 through July 31, 2014
Total funding: \$987,000
Summary: This research studies 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.

Equipment Grants

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

Honors and Awards

2018 Finalist, MIT Sloan Sports Analytics research paper competition
2017 - present Faculty Associate of the Duke Initiative for Science & Society

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| 2017 | Senior Honors, Honoree, Duke University |
| 2012 | Duke University, Dean's Service Recognition for Teaching: top 5% course evaluations |
| 2012 - 2013 | Australian International Research Initiatives, U. Western Sydney, Visiting Faculty Fellow |
| 2003 | Jack I. Yellow 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 |

Publications

Refereed Journal Articles (in reverse chronological order)

1. Beynel, L., Appelbaum, L.G., Lubner, B., Crowell, C.A., Hilbig, S.A., Lim, W., Nguyen, D., Chrapliwy, N., A., Davis, S.W., Cabeza, R. Lisanby, S.H., & Deng, Z-D. (in press). Effects of Online Repetitive Transcranial Magnetic Stimulation (rTMS) on Cognitive Processing: A Meta-Analysis and Recommendations for Future Studies. **Neuroscience & Biobehavioral Reviews**
2. Beynel, L., Davis, S., Crowell, C., Hilbig, S., Lim, W., Palmer, H., Brito, A., Peterchev, A., Lubner, B., Lisanby, S., Cabeza, R., & Appelbaum, L. (2019). Online repetitive transcranial magnetic stimulation during working memory in younger and older adults: a randomized within-subject comparison. **PLoS ONE**. 14(3):e0213707.
3. Addicott MA, Lubner B, Nguyen D, Palmer H, Lisanby SH, Appelbaum LG (2019). Low and high frequency rTMS effects on resting-state functional connectivity between the postcentral gyrus and the insula. **Brain Connectivity**. (ePub online April 2, 2019, <https://doi.org/10.1089/brain.2018.0652>)
4. Wilkins, L. and Appelbaum, L.G., (2019) An Early Review of Stroboscopic Visual Training: Insights, Challenges and Accomplishments to Guide Future Studies. **International Review of Sport and Exercise Psychology**. (ePub online March 1, 2019, <https://doi.org/10.1080/1750984X.2019.1582081>)
5. Addicott, M.A., Daughters, S.B., Strauman, T.J., and Appelbaum, L.G. (2018). Distress tolerance to auditory feedback and functional connectivity with the auditory cortex. **Psychiatry Research: Neuroimaging**. 282(30), 1-10.
6. Teel, E.F., Marshall, S.W., Appelbaum, L.G., Battaglini, C.L., Carneiro, K.A., Guskiewicz, K.M., Register-Mihalik, J.K., & Mihalik, J.P. A randomized controlled trial investigating the feasibility and adherence to an aerobic training program in healthy individuals. **Journal of Sports Rehabilitation**. (Epub ahead of print).
7. Davis, S.W., Crowell, C.A., Beynel, L., Deng, L., Lakhlani D., Hilbig, S.A., Lim, W., Palmer, H., Nguyen, D., Peterchev, A. V., Lubner, B., Lisanby, S.H., Appelbaum, L.G., Cabeza, R. (2018) Complementary topology of maintenance and manipulation brain networks in working memory. **Nature Scientific Reports**. 8:17827 | DOI:10.1038/s41598-018-35887-2
8. Teel, E.F, Register-Mihalik, J.K., Appelbaum, L.G., Battaglini, C.L., Carneiro, K.A., Guskiewicz, K.M., Marshall, S.W., & Mihalik, J.P. (in press). Randomized controlled trial evaluating effectiveness of aerobic training on common sport-related concussion outcomes in healthy participants. (2018). **Journal of Athletic Training**.
9. Wang, W-C., DeLang, M.D., Vittetoe, K., Ramger, B. & Appelbaum, L.G. (2018) Laterality Preferences in Athletes: Insights from a Database of 1770 Male Athletes. **American Journal of Sports Science**; 6(1): 20-25.
10. Rao, H.M., Khanna, R., Zielinski, D.J., Lu, Y., Clements, J.M., Potter, N.D., Sommer, M.A., Kopper, R. & Appelbaum, L.G. (2018) Sensorimotor learning during a marksmanship task in immersive virtual reality. **Frontiers in Psychology**. ePub available Feb 12, 2018. DOI: 10.3389/fpsyg.2018.00058

11. Burris, K., Vittetoe, K., Ramger, B., Suresh, S., Tokdar, S.T., Reiter, J.P. & Appelbaum, L.G. (2018) Sensorimotor abilities predict on-field performance in professional baseball. **Nature Scientific Reports**. 8(116), 1-9.
12. Klemish, D., Ramger, B., Vittetoe, K., Reiter, J.P., Tokdar, S. & Appelbaum, L.G (2018). Visual Abilities Distinguish Pitchers from Hitters in Professional Baseball. **Journal of Sports Sciences**. 36(2), 171-197. DOI: 10.1080/02640414.2017.1288296.
13. Devyatko, D., Appelbaum, L.G., & Mitroff, S.R. (2017). A common mechanism for perceptual reversals in motion-induced blindness, the Troxler effect, and perceptual filling-in. **Perception**. Vol. 46(1) 50-77.
14. Appelbaum, L.G. & Erickson, G. (2016). Sports Vision Training: a review of the state-of-the-art in digital training techniques. **International Review of Sport and Exercise Psychology**. Published online Dec 21, 2016. [<http://dx.doi.org/10.1080/1750984X.2016.1266376>]
15. van den Berg, B., Appelbaum, L.G., Clark, K., Lorig, M.M., & Woldorff, M.G, (2016). Visual search performance is predicted by both prestimulus and poststimulus electrical brain activity. **Nature Scientific Reports**. Published online Nov 30, 2016 [doi: 10.1038/srep37718]
16. Appelbaum, L.G., Lu, Y., Khanna, R., & Detwiler, K.R. (2016). The effects of sports vision training on sensorimotor abilities in collegiate softball athletes. **Athletic Training and Sports Health Care**. 8(4), 154-163. [DOI: 10.3928/19425864-20160314-01]
17. Krasich, K., Ramger, B., Holton, L., Wang, L., Mitroff, S.R., & Appelbaum, L.G. (2016). Perceptual and visual-motor learning in a computerized training battery. **Journal of Motor Behavior**. 48(5), 401-412.
18. Donahue, S., Appelbaum, L.G., McKay, C.C., & Woldorff, M.G. (2016). The neural dynamics of stimulus and response conflict processing as a function of response complexity and task demands. **Neuropsychologia**. 84, 14-28. [PMID: 26827917]
19. San Martín, R., Appelbaum, L.G., Pearson, J.M., Huettel, S.A, & Woldorff, M.G., (2016). Cortical brain activity reflecting attentional biasing toward reward-predicting cues covaries with economic decision-making performance. **Cerebral Cortex**. 26(1): 1-11. [PMID: 25139941]
20. Norcia, A.M., Appelbaum, L.G., Ales, J.M., Cottareau, B., & Rossion, B. (2015). The steady state visual evoked potential in vision research: a review. **Journal of Vision**. 15(4). [PMID: 26024451]
21. Grooms, D., Appelbaum, L.G., & Onate, J. (2015) The Implication of Visual-Motor Processing in Anterior Cruciate Ligament Injury and Rehabilitation. **Journal of Orthopaedic & Sports Physical Therapy**. 45(5): 381-393. [PMID: 25579692]
22. Wang, L.L., Krasich, K., Bel-Bahar, T., Hughes, L., Mitroff, S.R., & Appelbaum, L.G. (2015). Mapping the Structure of Perceptual and Visual-Motor Abilities in Healthy Young Adults. **Acta Psychologica**. 157, 74-84. [PMID: 25747573]
23. Clark, K., Appelbaum, L.G., Mitroff, S.R., & Woldorff, M.G. (2015) Improvement in visual search with practice: Mapping learning-related changes in neurocognitive stages of processing. **Journal of Neuroscience**. 35(13): 5351-5359. [PMID: 25834059]
24. McClintock, S.M., Choi, J., Deng, Z.D., Appelbaum, L.G., Krystal, A.D., & Lisanby, S.H. (2014) Multifactorial determinants of the neurocognitive effects of electroconvulsive therapy. **Journal of Electroconvulsive Therapy**. 30(2): 165-176. [PMID: 24820942]
25. Beam, E.**, Appelbaum, L.G.**, Jack, J., Moody, J., & Huettel, S.A., (2014). Mapping the semantic structure of cognitive neuroscience. **Journal of Cognitive Neuroscience**. 26(6): 1949-1965. [**Authors Contributed Equally]. [PMID: 24666126]
26. Appelbaum, L.G., Boehler, C.N., Won, R.J., Davis, L.A., & Woldorff, M.G. (2014). The dynamics of proactive and reactive cognitive control processes in the human brain. **Journal of Cognitive Neuroscience**. 26(5): 1021-1038. [PMID: 24345171]

27. Mills, D.L., Dai, L., Yam A., Fishman, I., U. Bellugi, U., A. L. Reiss, A.L., Appelbaum, L.G. & Korenberg, J.R. (2013). Genetic mapping of brain activity in Williams Syndrome: ERP markers of face and language processing are stable across development. **Developmental Neuropsychology** 38(8): 613-642. [PMID: 24219698]
28. Appelbaum, L.G., Donahue, S., Park, C.J., & Woldorff, M.G. (2013). Is one is enough? The case for non-additive influences of visual cues on cross-modal Stroop interference. **Frontiers in Perception Science** 4(799). [PMID: 24198800]
29. Appelbaum, L.G., Cain, M.S., Darling, E.F., & Mitroff, S.R., (2013). Action video game playing is associated with improved visual sensitivity, but not alterations in visual sensory memory. **Attention, Perception and Psychophysics**. 75(6): 1161-1167. [PMID: 23709062]
30. Donahue, S., Appelbaum, L.G., Park, C.J., Roberts, K.C., & Woldorff, M.G. (2013). Cross-modal stimulus conflict: The effects of stimulus input timing in a visual-auditory Stroop task. **PLoS ONE** 8(4). [PMID: 23638149]
31. San Martín, R., Appelbaum, L.G., Pearson, J.M., Huettel, S.A, & Woldorff, M.G., (2013). Rapid brain responses independently predict gain-maximization and loss-minimization during economic decision-making. **Journal of Neuroscience**, 33(16): 7011-7019. [PMID: 23595758]
32. Ales, J.M., Appelbaum, L.G., Cottureau, B., & Norcia, A.M., (2013). The time course of shape discrimination in the human brain. **NeuroImage** 67, 77-88. [PMID: 23116814]
33. Krebs R.M., Boehler C.N., Appelbaum L.G., Woldorff M.G. (2013) Reward Associations Reduce Behavioral Interference by Changing the Temporal Dynamics of Conflict Processing. **PLoS ONE** 8(1). [PMID: 23326530]
34. Appelbaum, L.G., Cain, M.S., Schroeder, J.E., Darling, E.F., & Mitroff, S.R. (2012). Stroboscopic visual training improves information encoding in short-term memory. **Attention, Perception, and Psychophysics**. 74(8), 1681-1691. [PMID: 22810559]
35. Appelbaum, L.G., Boehler, C.N., Davis, L.A., Won, R.J., & Woldorff, M.G. (2012). Strategic allocation of attention reduces temporally predictable stimulus conflict. **Journal of Cognitive Neuroscience**. 24:1834-1848. [PMID: 22360623]
36. Appelbaum, L.G., Ales, J.M., & Norcia, A.M. (2012). The time course of segmentation and cue-selectivity in the human visual cortex. **PLoS ONE** 7(3): e34205. [PMID: 22479566]
37. Boehler, C.N., Appelbaum, L.G., Krebs, R.M., Hopf, J.M., & Woldorff, M.G. (2012). The influence of different Stop-signal response time estimation procedures on behavior-behavior and brain-behavior correlations. **Behavioral Brain Research**. 229, 123-130. [PMID: 22245527]
38. Appelbaum, L.G., Cain, M.S., Darling, E.F., Stanton, S.J., Nguyen, M.T., & Mitroff, S.R., (2012). What is the identity of a sports spectator? **Personality and Individual Differences**. 52, 422-427. doi:10.1016/j.paid.2011.10.048.
39. Appelbaum, L.G., Schroder, B, J., Cain, M.S., & Mitroff, S.R., (2011). Improved visual cognition through stroboscopic training. **Frontiers in Perception Science**. 2(276), 1-13. [PMID: 22059078]
40. Boehler, C.N., Appelbaum, L.G., Krebs, R.M., Hopf, J.M., & Woldorff, M.G. (2011). The role of stimulus salience and attentional capture across the neural hierarchy in a stop-signal task. **PLoS ONE**, 6(10), 1-10. [PMID: 22022611]
41. Appelbaum, L.G., Smith, D.V., Boehler, C.N., Chen, W.D., & Woldorff, M.G. (2011). Rapid modulation of sensory processing induced by stimulus conflict. **Journal of Cognitive Neuroscience**. 23(9), 2620-2628. [PMID: 20849233]
42. Jack, J & Appelbaum, L.G. (2010). This is your brain on rhetoric: research direction for neuroretorics. Special issue on Neuroretorics in **Rhetoric Society Quarterly**. 40: 5, 411-437.

43. Appelbaum, L.G., Ales, J.M., Cottureau, B., & Norcia, A.M. (2010). Configural specificity of the lateral occipital cortex. **Neuropsychologia**, 48, 3323-3328. [PMID: 20638395]
44. Boehler, C.N., Appelbaum, L.G., Krebs, R.M., Hopf, J.M., & Woldorff, M.G. (2010). Pinning down response inhibition in the brain - conjunction analyses of the Stop-signal task. **NeuroImage**, 52(4), 1621-1632. [PMID: 20452445]
45. Appelbaum, L.G., Meyerhoff, K.L., & Woldorff, M.G. (2009). Priming and backward influences in the human brain: processing interactions during the Stroop interference effect. **Cerebral Cortex**, 19(11), 2508-2521. [PMID: 19321654]
46. Appelbaum, L.G., Liotti, M., Perez, R., Fox, S.P., & Woldorff, M.G. (2009). The temporal dynamics of implicit processing of non-letter, letter, and word-forms in the human visual cortex. **Frontiers in Human Neuroscience**, 3:56. [PMID: 20046826]
47. Appelbaum, L.G., & Norcia, A.M. (2009). Attentive and pre-attentive aspects of figural processing. **Journal of Vision**, 9(11), 18 11-12. [PMID: 20053081]
48. Appelbaum, L.G., Wade, A.R., Pettet, M.W., Vildavski, V.Y., & Norcia, A.M. (2008). Figure-ground interaction in the human visual cortex. **Journal of Vision**, 8(9), 8 1-19. [PMID: 18831644]
49. Appelbaum, L.G., Lu, Z-L., & Sperling, G. (2007). Contrast amplification in global texture orientation discrimination. **Journal of Vision**, 7(10), 13 11-19. [PMID: 17997682]
50. Appelbaum, L.G., Wade, A.R., Vildavski, V.Y., Pettet, M.W., & Norcia, A.M. (2006). Cue-invariant networks for figure and background processing in human visual cortex. **Journal of Neuroscience**, 26(45), 11695-11708. [PMID: 17093091]
51. Mervis, C.B., Morris, C.A., Klein-Tasman, B.P., Bertrand, J., Kwitny, S., Appelbaum, L.G., & Rice, C.E. (2003). Attentional characteristics of infants and toddlers with Williams Syndrome during triadic interactions. **Developmental Neuropsychology**, 23(1-2), 243-268. [PMID: 12730027]
52. Mills, D.L., Alvarez, T.D., St George, M., Appelbaum, L.G., Bellugi, U., & Neville, H. (2000). Electrophysiological studies of face processing in Williams syndrome. **Journal of Cognitive Neuroscience**, 12 1, 47-64. [PMID: 10953233]

Book Chapters

1. Beynel, L., Appelbaum, G., & Kimbrel, N. A. (in press). 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.
2. Jack, J., Appelbaum, L.G., Beam, E., Huettel, S.A., & Moody, J. (2017). "Mapping Rhetorical Topologies in Cognitive Neuroscience." *Persuasive Topologies: Equipment for a Post-Critical Rhetoric of Technoscience, Media, and Culture*. Eds. Walsh, L. and Boyle, C. New York: Palgrave Macmillan.
3. Mills, D.L.; Alvarez, T.D.; St George, M.; Appelbaum, L.G.; Bellugi, U.; & Neville, H. (2001). Neurophysiological markers of face processing in Williams syndrome. *Journey from cognition to brain to gene: Perspectives from Williams syndrome*. 73-104. MIT Press.

Book Sections

1. Appelbaum, L.G. & Harris, J.A., (2012). "Attention and the processing of visual scenes". In Norbert, M. (Ed.) *Science of Learning*. Springer.
2. Appelbaum, L.G. (2011) The influence of attention on figure-ground processing. *The Encyclopedia of the Sciences of Learning*, Springer Press.
3. Appelbaum, L.G. (2009). "Perceptual Segregation". In B. Goldstein (Ed.), *Encyclopedia of Perception* (pp. 793-796): SAGE Press.

Refereed Conference Papers

1. Appelbaum, L.G., Deng, Z-D, Palmer, H., Beynel, L., Watts, A., Young, J.R., Lisanby, S.H., Migaly, J. & Cox, M.L., (2019) Proceedings #2: Transcranial Direct Current Stimulation to Enhance Laparoscopic Technical Skill Learning: A Preregistered Randomized Controlled Trial. **Brain Stimulation**. 12(2) e57-e59.
2. Clements, J. M., Kopper, R., Zielinski, D. J., Rao, H., Sommer, M. A., Kirsch, E., Mainsah, B. O., Collins, L. M., and Appelbaum, L. G. (2018) Neurophysiology of visual-motor learning during a simulated marksmanship task in immersive virtual reality. In **Proceedings of the 25th IEEE Conference on Virtual Reality and 3D User Interfaces**, March 18-22, 2018, Reutlingen, Germany.
3. 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.
4. Zielinski, D., Rao, H.M., Potter, N., Appelbaum, L.G., and Kopper, R. (2016). Evaluating the effects of image persistence on dynamic target acquisition in low frame rate virtual environments. In **IEEE Symposium on 3D User Interfaces (3DUI)**.

Publicly Available Pre-Print Papers

1. Beynel, L., Davis, S., Crowell, C., Hilbig, S., Lim, W., Nguyen, D., Peterchev, A., Luber, B., Lisanby, S., Cabeza, R., & Appelbaum, L. (2018) Effects of 5Hz repetitive transcranial magnetic stimulation to dorsolateral prefrontal cortex on working memory manipulation abilities. **BioRxiv preprint**. <https://www.biorxiv.org/content/early/2018/03/08/278655>
2. Luber, B., Jangraw, D.C., Appelbaum, L.G., Harrison, A., Hilbig, S., Beynel, L., Jones, T., Sajda, P., & Lisanby, S.H. (2018) Transcranial magnetic stimulation identifies spatially and temporally localized causal networks underlying perceptual decision making in the human brain. **BioRxiv preprint**. <https://www.biorxiv.org/content/early/2018/04/18/304063>
3. Appelbaum, L.G., Deng, Z-D, Palmer, H., Beynel, L., Watts, A., Young, J.R., Lisanby, S.H., Migaly, J. & Cox, M.L., (2018) Utilizing Transcranial Direct Current Stimulation to Enhance Laparoscopic Technical Skills Training: A Randomized Controlled Trial. **BioRxiv preprint**. <https://www.biorxiv.org/content/early/2018/10/30/455329.article-info>
4. Davis, S.W., Crowell, C.A., Beynel, L., Deng, L., Lakhiani D., Hilbig, S.A., Palmer, H., Wang, J., Peterchev, A. V., Luber, B., Lisanby, S.H., Appelbaum, L.G., Cabeza, R. (2019) Older adults benefit from more widespread brain network integration during working memory. **BioRxiv preprint**. <https://www.biorxiv.org/content/10.1101/642447v1>

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.

Pre-Registered Clinical and Research Trials

1. Appelbaum, L.G., (2016) Using TMS to Increase Executive Function in Older Adults (WMTMS). Identification No. NCT02767323. Available at: <https://clinicaltrials.gov/ct2/show/NCT02767323>.
2. Appelbaum, L.G., (2017) Effects of rTMS on Human Brain Activity Measured With EEG and fMRI. Identification No. NCT03259568. Available at: <https://clinicaltrials.gov/ct2/show/NCT03259568>.
3. Appelbaum, L.G., (2018) Utilizing Transcranial Direct Current Stimulation to Enhance Laparoscopic Technical Skills Training. Identification No. NCT03083483. Available at: <https://clinicaltrials.gov/ct2/show/NCT03083483>

4. Appelbaum, L.G., (2017) Utilizing Gaze Training to Enhance Laparoscopic Skills Training. Identification No. NCT03413943. Available at: <https://clinicaltrials.gov/ct2/show/NCT03413943>
5. Appelbaum, L. G., Liu, S., Hilbig, S., Rankin, K., Naclario, M., Asamo, E., ... Burriss, K. (2018). Sports Vision Training in Collegiate Baseball Batters. doi: 10.17605/OSF.IO/496RX.

Pre-Registered Meta Analyses and Reviews

1. Beynel, L., Appelbaum, L.G., Davis, S. W., Lubner, 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. Available at: 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. Available at: http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42019119982

Invited Talks and Colloquia

| | | |
|-----------|------------------------------------|--|
| 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 | Vision Service Providers, National HQ, 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 and Neurophysiology 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 Technology 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 & Neuroimaging Working Group |

Representative Conference Abstracts (12 out of 86)

1. **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.
2. 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.
3. **Appelbaum, L.G.**, Cain, M.S., Schroeder, J.E., Darling, E.F., & Mitroff, S.R. Improving visual cognition through stroboscopic training. Vision Sciences Society, Naples, FL. May, 2013.
4. **Appelbaum, L.G.**, Boehler, C.N., & Woldorff, M.G., Proactive and reactive cognitive control in the human brain. Cognitive Neuroscience Society. Chicago, IL. April 2012.
5. Beam, E., **Appelbaum, L.G.**, Jack, J., Moody, J., & Huettel, S.A., Mapping the Intrinsic Structure of Cognitive Neuroscience. Society for Neuroscience, Washington DC, 2011.
6. Mitroff, S.R., **Appelbaum, L.G.**, Schroder, B, J., & Cain, M.S., Improved Visual Cognition Through Stroboscopic Training. Annual Meeting of the Psychonomic Society, Seattle WA, November 2011.
7. **Appelbaum, L.G.**, Boehler, C.N., Won, R., Davis, L., & Woldorff, M.G., Strategic orientation of attention reduces temporally predictable stimulus conflict. Cognitive Neuroscience Society, San Francisco, April 2011.
8. **Appelbaum, L.G.**, Boehler, C.N., Woldorff, M.G., 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. 2010.
9. **Appelbaum, L.G.**, Meyerhoff, K., Chen, W.D., Woldorff, M.G. "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. 2008. [Abstract].
10. **Appelbaum, L.G.**, Vildavski, V.Y., Pettet, M.W., Wade, A.R., & Norcia, A.M. "Voluntary attention: the influence of feedback on figural processing." Society for Neuroscience, San Diego, CA. 2007.
11. **Appelbaum, L.G.**, Pettet, M.W., Vildavski, V., Wade, A., Norcia, A.M. "Cue-invariant Networks for Figure and Background Processing in Human Visual Cortex." Annual Interdisciplinary Conference, Jackson, WY, Feb 2006. [Abstract].
12. **Appelbaum, L.G.**, Lu, Z.-L., & Sperling, G. "Amplifying Contrast: Example from Motion and Texture." Annual Interdisciplinary Conference, Jackson, WY, Jan 2002. [Abstract].

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 |

Sensation and Perception (Psych 130)

University of California, Irvine

2003, Summer

Team Taught Graduate Courses

Principles in Cognitive Neuroscience (Graduate)

Duke University

Annually 2009-16

Research Supervision

Faculty Supervision

| | | |
|-----------------------------------|------------------------|---|
| Noreen Bukhari-Parlakturk, MD PhD | February 2018– present | Duke KL2 Career Development Mentor |
| Andrada Neacsiu, Ph.D. | January 2017 – present | Duke KL2 Career Development Mentor |
| Andrada Neacsiu, Ph.D. | January 2016 – 2018 | NARSAD Young Investigator Award Mentor |

Supervised Postdoctoral Fellows

| | |
|------------------------------|------------------------------|
| Sicong ('Zone') Liu, PhD | March 2018 - present |
| Olga Lucia Gamboa Arana, PhD | February 2018 – present |
| Lysianne Beynel, PhD | January 2016 – present |
| Lingling Wang, PhD | January 2013 – March 2014 |
| Tarik Bel-Bahar, PhD | November 2012 – October 2013 |

Supervised Residents

| | |
|-----------------------------|----------------|
| Jonathan Young (Psychiatry) | 2016 - Present |
| Morgan Cox (Surgery) | 2015 - 2018 |

Supervised Clinical Research Coordinators/Specialists (Duke University SOM)

| | |
|------------------|------------------------------|
| Ethan Campbell | May 2019 - present |
| Connor Hile | June 2018 – Jun 2019 |
| Alexandra Brito | June 2017 – May 2018 |
| Hannah Palmer | May 2017 – present |
| Duy Nguyen | August 2016 – June 2017 |
| Courtney Crowell | June 2016 – July 2019 |
| Susan Hilbig | November 2015 – present |
| Kristina Krasich | November 2012 – July 2014 |
| Lauren Hugens | November 2012 – October 2013 |

Ph.D. Thesis Supervision

| | | | |
|-----------------------|-------------------------------------|---------------------------|------------------|
| Christina Vander Vegt | UNC Exercise and Sports Sciences | Advancement, July 2019 | Committee member |
| Kyle Burris | Duke, Department of Statistics | Defended, July 2019 | Committee member |
| Jillian Clements | Duke, Engineering | Defended, May 2019 | Co-Chair |
| Liz Teel | UNC Exercise and Sports Sciences | Defended, April 2017 | Committee member |

Master's Thesis Supervision

| | | | |
|---------------|----------------------------------|----------------------|------------------|
| Taryn Gilrein | UNC Exercise and Sports Sciences | Defended, April 2014 | Committee member |
|---------------|----------------------------------|----------------------|------------------|

Supervised Graduate Research (Duke University)

| | | |
|------------------|--------------|--------------|
| Tracy d'Arbaloff | Practicum | Spring, 2018 |
| Lifu Deng | Lab Rotation | Spring, 2018 |
| Matthew DeLang | Lab Rotation | 2016 - 2017 |

Undergraduate Honors Thesis Supervision (Duke University)

| | | |
|------------------------|----------------------|------------------|
| Joyce Wang | Defended, April 2019 | Primary advisor |
| Elayna Kirsch | Defended, April 2018 | Primary advisor |
| Jordan Cohen | Defended, April 2017 | Committee member |
| McKenzie Middlebrooks | Defended, April 2017 | Committee member |
| Natasha Sakraney | Defended, April 2016 | Primary advisor |
| Yvonne Lu | Defended, April 2016 | Primary advisor |
| Annie Apple | Defended, April 2016 | Primary advisor |
| Garland Austin | Defended, April 2016 | Primary advisor |
| Peter Cangialosi | Defended, April 2016 | Committee member |
| Delaney Lagrew | Defended, April 2016 | Committee member |
| Sheetal Hedge | Defended, April 2015 | Committee member |
| April Ratliff | Defended, April 2015 | Committee member |
| Daniela De Albuquerque | Defended, April 2015 | Committee member |
| Eliza Gentzler | Defended, April 2014 | Primary advisor |
| Christopher Mazis | Defended, April 2014 | Committee member |
| Elizabeth Beam | Defended, April 2013 | Committee member |

Supervised Undergraduate Research (Duke University)

| | | | |
|------------------|----------------|-------------------|-------------|
| | | Sheetal Hedge | 2014 – 2015 |
| Erikson Nichols | 2018 – Present | Natasha Sakraney | 2014 – 2016 |
| Edem Asamoah | 2018 – Present | Kelly Vittetoe | 2014 – 2017 |
| Rachel Donaldson | 2017 – Present | Rajan Khanna | 2014 – 2017 |
| Maria Naclerio | 2017 – Present | Clara Colombatto | 2013 |
| Elayna Kirsch | 2016 – 2018 | Annie Apple | 2013 – 2016 |
| Amanda Watts | 2016 – 2018 | Ben Ramger | 2013 – 2016 |
| Wesley Lim | 2016 – 2018 | Laura Holton | 2013 – 2016 |
| Joyce Wang | 2015 – Present | Yvonne Lu | 2013 – 2016 |
| Eliane Schinder | 2015 – 2016 | Eliza Gentzler | 2013 – 2014 |
| Garland Austin | 2015 – 2016 | Floyd Wilks | 2013 – 2014 |
| Chrislyn Choo | 2014 – 2015 | Gabriela Asturias | 2013 – 2014 |

Supervised Mentee Research Fellowships and Awards:

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
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 Program in Research - Awarded to Ms. Eliza Gentzler and Mr. Stephen Adamo

Undergraduate Student Advising

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

Training and Certifications

Professional Training

Visiting Fellowship in Transcranial Magnetic Stimulation – Duke University Medical Center

Certifications

Transcranial Magnetic Stimulation Operators Certification - Duke University Medical Center

Duke Immersive Virtual Environment Operator Certificate

Basic Life Saving

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

Nike SPARQ Sensory Performance Certified Trainer

NAUI Scuba Diving Instructor

Professional Service and Outreach

Organizational Duties

Co-Chair, 2018-19 Psychiatry and Behavioral Sciences Faculty Search Committees

Center for Cognitive Neuroscience Colloquium Organizer, 2012-13 & 2017-18

Conference Section Chair, Fall Vision Meeting - Optical Society of America, 2006-2009

UC Irvine Neuroscience Symposium, Co-Chair, 2003

Grant Review

NIH Special Emphasis Panel/Scientific Review Group 2019/05 ZRG1 BBBP-X (02) M

NIH Special Emphasis Panel/Scientific Review Group 2017/05 ZRG1 BDCN-J (51) S

Army Research Office

National Science Foundation, USA

Netherlands Organisation for Scientific Research

Manitoba Medical Service Foundation, Canada

Book Reviewer

Cambridge University Press

Journal Review Board

Brain Topography (2017-2021)

Ad hoc Journal Reviewer

| | |
|--|--|
| Proceedings of the National Academy of Science | Frontiers in Human Neuroscience |
| Journal of Neuroscience | Vision Research |
| Journal of Neurophysiology | PLoS One |
| Journal of Cognitive Neuroscience | Experimental Brain Research |
| Human Brain Mapping | BMC Neuroscience |
| Neuropsychologia | Brain Research |
| Cognitive, Affective, & Behavioral Neuroscience | Journal of Vision |
| Perceptual and Motor Skills | Cortex |
| Acta Psychologica | Motor Control |
| Journal of Sports and Exercise Psychology | Nature, Scientific Reports |
| Brain Topography | Journal of Cognitive Enhancement |
| International Journal of Sports Physiology and Performance | International Journal of Sports Science and Coaching |
| Journal of Science and Medicine in Sports | BrainFacts.org (publication of the Society for Neuroscience) |
| eNeuro | |

Professional Society Membership

| | |
|--------------------------------|------------------------|
| Sigma Xi | Member, 2002 – Present |
| Vision Science Society | Member, 2004 – Present |
| Society for Neuroscience | Member, 2005 – Present |
| Cognitive Neuroscience Society | Member, 2009 – Present |
| Psychonomic Society | Member, 2013 – 2015 |
| Optical Society of America | Member, 2005-2009 |

Scientific Outreach

BOOST: Building Opportunities & Overtures in Science & Technology, instructor, 2019
Summer Symposia in Neuroscience and Philosophy, instructor, 2016, 2017, 2018
Duke Accelerated STEM High School Program, instructor, 2016, 2017, 2018, 2019
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