Thomas J. Covey, PhD
Assistant Professor of Neurology

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Contact: Division of Cognitive and Behavioral Neurosciences
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Education:

2016 Ph.D., Neuroscience, State University of New York at Buffalo
Dissertation: "Adaptive working memory and visual search training have differential effects on brain function and cognitive performance: Evidence from event-related brain potentials and transfer of gains"

2010 M.S., Neuroscience, State University of New York at Buffalo
Thesis: "Behavioral indices of information processing speed, neural efficiency, and working memory and their relationship with quantitative structural MRI in Multiple Sclerosis"

2008 B.S., Brain and Cognitive Sciences with Distinction, University of Rochester

Professional Appointments:

2017-Present Assistant Professor, Department of Neurology, Division of Cognitive and Behavioral Neurosciences, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

2011-Present Laboratory Manager, Division of Cognitive and Behavioral Neurosciences, Department of Neurology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

2016-2017 Research Assistant Professor, Division of Cognitive and Behavioral Neurosciences, Department of Neurology, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

Awards & Honors:

2017 Dean's Award for Outstanding Dissertation Research
Awarded for best dissertation in the Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

2017 Bishop Award in Neuroscience
Awarded for best Neuroscience doctoral dissertation, University at Buffalo

2012 Gina M. Finzi Memorial Summer Graduate Fellowship from the Lupus Foundation of America, Inc.

2011 Society for Neuroscience Conference Graduate Student Travel Award
Presentation Title: Single trial variability of event-related potentials as an index of neural efficiency during information processing

2011 Gina M. Finzi Memorial Summer Graduate Fellowship from the Lupus Foundation of America, Inc.

Professional Society Memberships:

2011-Present Society for Neuroscience

2009-Present Psi Chi International Honor Society in Psychology

2014 Society for Psychophysiological Research

Invited Presentations:

2013 Modification of the cognitive desktop: Examining working memory dysfunction and assessing potential methods for strengthening this core cognitive ability. Cognitive Psychology Brown Bag Seminar, University at Buffalo.

2013 The neural basis of cognitive functioning: Methods, experimental findings, and implications. Biology Program Seminar Series, Canisius College.

2014 Can targeted training of working memory broadly enhance cognition and intellectual function? Works in Progress meeting, University at Buffalo.

2014 An introduction to Event-Related Potentials (ERPs): The good, the bad, and the noisy. Department of Communicative Disorders and Sciences Colloquium, University at Buffalo.

2015 The effects of training working memory and stimulus interference control processes on cognitive performance and underlying brain activity: Preliminary findings. Department of Neurology Grand Rounds, University at Buffalo.

2017 Use of neurocognitive outcome measures in testing the efficacy of photobiomodulation therapy for the treatment of TBI: A pilot study. Center for Translational and Clinical Biophotonics Seminar Series, University at Buffalo.

2017 Improving performance at the cognitive desktop: The effects of targeted working memory training on neurocognitive processes in healthy individuals and in patients with Multiple Sclerosis. Department of Neurology Grand Rounds, University at Buffalo.

Additional Academic Talks and Panels:

2010 Processing speed, neural efficiency and working memory: Their relationship with MRI measures in Multiple Sclerosis. Platform presentation at the 4th Annual University at Buffalo Neuroscience Research Day.

2011 Panel Moderator, "Careers in Neuroscience" panel discussion. University at Buffalo.

2012 Panelist, "Being a Graduate Student in the Biomedical and Psychological Sciences." Presented to undergraduate and graduate students at the University at Buffalo.

2013 Event-related potential indices of working memory functioning: Implications for the evaluation of cognitive dysfunction in clinical populations and outcomes following targeted training. Platform presentation at the 2nd annual Brain and Behavior Science Symposium, University at Buffalo.

2013 Panelist, "Graduate School in the Biological Sciences." Presented to undergraduate students at SUNY Geneseo.

2014 Disrupting the cognitive desktop: An examination of brain dysfunction and working memory deficits in Systemic Lupus Erythematosus. Presented at University at Buffalo Neuroscience Graduate Student Association meeting.

2014 Panelist, "Graduate School in the Biological Sciences." Presented to undergraduate students at SUNY Geneseo.

2015 Panelist, Brain Bee Research and Medical Careers Discussion. Presented to high school students at Canisius College.

2016 Evaluation of inhibitory control and distraction using event-related potentials in healthy individuals and patients with Multiple Sclerosis. Platform presentation at Human-Computer Interaction International Conference, Toronto.

2017 Visual-verbal working memory training versus visual search training have overlapping and distinct transfer effects on tasks of spatial working memory and cognitive control: An event-related potential study. Platform presentation at Society for Neuroscience Conference, Washington, DC.

Professional Service:

2009-Present Manuscript Reviewer

Journals that I have reviewed for recently or have reviewed for on an ongoing basis: International Journal of Psychophysiology; Experimental Brain Research; Physiology & Behavior; Progress in Neuropsychopharmacology & Biological Psychiatry; Journal of Clinical and Experimental Neuropsychology

Journals that I have reviewed for in the past: Psychiatry Research: Neuroimaging; Journal of Psychosomatic Research

Service to the Public:

2009-2015 Brain Awareness Week Organizer/Participant
Community outreach initiative from the Society for Neuroscience, focused on teaching elementary, middle, and high school students about the brain at local area schools.

2011 "The development of cognitive function." Talk presented as part of a mini-symposium entitled "How the Brain Learns." Presented to the teaching faculty at Highgate Heights Elementary School, Buffalo.

2015 National Brain Bee Judge
An initiative of the Society for Neuroscience, where high school students taking part in the competition are quizzed about Neuroscience

University Service:

2010-2011 Treasurer, University at Buffalo Neuroscience Graduate Student Association

2011 University at Buffalo Mark Diamond Research Fund Committee Reviewer

2011-2012 President, University at Buffalo Neuroscience Graduate Student Association
Highlights:

- Organized and moderated a "Careers in Neuroscience" panel discussion targeted towards an audience of undergraduate and graduate students.
- Helped organize Brain Bee 2012 event
- Organized Brain Awareness Week 2012 events
- Organized Neuroscience GSA Invited Speaker event, 2012
- Initiated Neuroscience GSA newsletter

2012 Organizer, "Being a Graduate Student in the Biomedical and Psychological Sciences" panel discussion.

2012-2014 Editor-in-Chief, Founder, *NeuroNews*, a newsletter from the UB Neuroscience Graduate Student Association.

2013-2014 Webmaster, University at Buffalo Neuroscience Graduate Student Association

Courses Taught & Other Educational Activities:

Fall 2017 Course Director/Instructor, Biomedical Sciences Transfer Student Seminar (BMS 198)
Biomedical Undergraduate Education, University at Buffalo
Description: The primary aims of the course are the enrichment of critical thinking, writing, communication, and study skills in incoming UB Biomedical Sciences transfer students (typically sophomore/junior level); course material is focused on topics in Neuroscience and the Biomedical Sciences.

Fall 2017 Guest Instructor, Biomedical Sciences Freshman Seminar (BMS 199)
Biomedical Undergraduate Education, University at Buffalo
Description: Discussion-based seminars focusing on introductory Neuroscience topics; also part of a panel discussion on scientific careers.

Spring 2015 Adjunct Instructor, Neurobiology I (Bio 541)
Physical Therapy Department, Daemen College, Buffalo NY
Description: Taught fourth-year students in the Physical Therapy program; two part class included a neuroanatomy laboratory, and a team-taught lecture section.
Neuroanatomy Laboratory Section: Instructed at weekly laboratory sections, including neuroanatomy lectures, sheep brain dissection, and lab practicals.
Lecture sections taught: Learning and memory, coding of information, sensation and perception, spinal reflexes, motor function

2010-2014 Prep Class Instructor, Western New York Brain Bee
Canisius College, Buffalo NY
Description: Event is part of a national competition for high school students, an initiative of the Society for Neuroscience. The prep class is a one day, 3-4 hour team-taught class. Sections I have taught include: Diagnostic methods and therapies in neuroscience; stress response; the aging brain; research methods in neuroscience; learning and memory.

Fall 2011 Guest Instructor, Neuroscience 521: Systems Neuroscience
Neuroscience Program, University at Buffalo, Buffalo NY
Description: Graduate student level course, instructed journal club portion of the Cognitive Neuroscience section.

2011-Present I frequently present lectures about neuroimaging and brain research methods, working memory, and other cognitive neuroscience topics to students at laboratory meetings (including undergraduate and graduate level) in the Division of Cognitive and Behavioral Neurosciences. I also regularly lead laboratory students in the Division in journal article discussions.

Research Supervision:

As a member of the Division of Cognitive and Behavioral Neurosciences I have been directly involved in the mentorship and training of 20+ undergraduate and graduate students (11 Psychology MA students; 4 Neuroscience MS students; 1 Neuroscience PhD student; and 14 undergraduate students, including two Psychology honors thesis projects).

Current Graduate Student Advisement and Thesis/Dissertation Committees:

2017-Present Xuedi Wang, PhD Program in Neuroscience

2017-Present Swapna Balkundi, MA Program in Psychology

Previous thesis/research projects in which I have served a major mentorship role include:

2017 Rosanna Pagan-Aleman, MA, Psychology
Thesis: The n-back task compared to neuropsychological tests of working memory in patients with Systemic Lupus Eurythematosus.
Current Position: PsyD Clinical Psychology Program at The Chicago School of Professional Psychology.

2017 Melissa Meynadasy, BS, Psychology Honors Thesis, High Honors
Thesis: Response priming and conflict processing in Police Officers with a range of PTSD Symptomatology: An event-related brain potential study.
Current Position: Research Assistant in the Division of Cognitive and Behavioral Neurosciences, Department of Neurology, University at Buffalo.

2016 Xuedi Wang, MS, Neuroscience
Thesis: Working memory impairment and brain structural damage in patients with Systemic Lupus Erythematosus: A combined event-related potential and multimodal imaging study
Current Position: PhD student, Neuroscience Program, University at Buffalo

2016 Johan Nakuci, MS, Biological Sciences
Thesis: Systemic Lupus Erythematosus induced theta and alpha activity impairment during working memory maintenance
Current Position: PhD student, PhD Program in Biomedical Sciences, University at Buffalo.

2016 Kayla Sherwood, MA, Psychology
Thesis: Individual differences in the efficacy of working memory training and transfer
Current Position: Care Management, Liberty Resources Inc.

2015 Megan Spelman, MS, Neuroscience
Thesis: MRI measures as predictors of working memory performance in Systemic Lupus Erythematosus
Current Position: Medical Student, LECOM Bradenton, Fl.

2015 Erika Pugh, MA, Psychology
Thesis: The relationship between maintenance and retrieval stages of working memory in Systemic Lupus Erythematosus: An electrophysiological study
Current Position: Clinical Research Assistant, Alzheimer's Disease Research Unit, Yale University School of Medicine

2015 Lan Yan Goh, MA, Psychology
Thesis: Perceptual task difficulty and inhibitory control in Police officers: An event-related potential (ERP) study using a Go/Nogo continuous performance task
Current Position: Psychologist, ICA Psychological Services

2015 Amanda Adams, MA, Psychology
Thesis: The relationship between polysomnographic variables and quality of life in individuals with obstructive sleep apnea.
Current Position: Behavior Specialist, Anderson Center for Autism

2013 Sara Long, MA, Psychology
Thesis: Gender differences in obstructive sleep apnea: A study to improve diagnostic sensitivity for women
Current Position: PhD Student at Colorado State University; Lecturer at University of Colorado, Colorado Springs

2013 Rowena Chin, BS, Psychology Honors Thesis, Highest Honors, Winner of Feldmen-Cohen Award (Best Undergraduate Psychology Honors Thesis)
Thesis: An event-related potential (ERP) study of the effects of perceptual task difficulty on cognitive control.
Current Position: Completed MS in Neuroscience at University College London; Accepted at multiple schools in Neuroscience PhD programs

2013 Rushell Dixon, Collaborative Learning and Integrated Mentoring in the Biosciences (CLIMP) Undergraduate Program Scholar
Project Title: Working memory deficiencies in neuropsychiatric Systemic Lupus Erythematosus

Grant & Fellowship Support:

Active:

2018-2020 National Institutes of Justice Research Grant
Title: The effects of Post-Traumatic Stress Disorder (PTSD) symptoms on behavioral, psychological, and neurophysiological measures of decision making in police officers.
Role: Co-PI
Amount: $814,158

2017-2020 National Multiple Sclerosis Society Research Grant
Title: The effects of working memory training on brain function, structure, and cognition in MS
Role: Co-PI
Amount: $608,839

2016-2018 American Society for Laser Medicine and Surgery Pilot Research Grant
Title: Neurocognitive, electrophysiological and MRI changes associated with low level laser therapy (photobiomodulation) in the treatment of Traumatic Brain Injury: A pilot study
Role: Co-Investigator
Amount: $60,000

2018-2019 Biogen Research Grant (Pending)
Title: Evaluating event-related brain potential changes associated with Natalizumab therapy in Multiple Sclerosis patients
Role: Co-PI
Amount: $130,000

Completed:

2014-2016 National Multiple Sclerosis Society Pilot Research Grant
Title: Does working memory training improve brain function and cognition in healthy individuals and patients with Multiple Sclerosis?
Role: Graduate Student Investigator
Amount: $44,000

2014 Mark Diamond Research Fund Dissertation Grant from the University at Buffalo
Title: Event-related potential indices of improved brain function and transfer effects after working memory training.
Role: Graduate Student Investigator
Amount: $2,000

2012 Conference Travel Grant from the University at Buffalo Graduate Student Association
Title: Electrophysiological, behavioral, and structural indices of working memory dysfunction in Systemic Lupus Erythematosus
Poster presented at Society for Neuroscience conference.
Amount: $500

2012 Gina M. Finzi Memorial Summer Graduate Fellowship from the Lupus Foundation of America, Inc.
Title: MRI, electrophysiology and working memory impairment in SLE
Role: Graduate Student Fellowship
Amount: $4,000

2011 Gina M. Finzi Memorial Summer Graduate Fellowship from the Lupus Foundation of America, Inc.
Title: White matter integrity and working memory dysfunction in SLE
Role: Graduate Student Fellowship
Amount: $2,000

Submitted Grant Applications (under review):

2017 Language Learning Early Career Research Grant
Title: The relationship between dynamic neural indices of executive function and receptive language performance in school-aged children.
Role: Principal Investigator

Publications:

Covey, TJ, Shucard, JL, Benedict, RHB, Weinstock-Guttman, B, & Shucard, DW. 2017. Improved cognitive performance and event-related potential changes following working memory training in patients with Multiple Sclerosis. Multiple Sclerosis Journal – Experimental, Translational, and Clinical, In Press.

Covey, TJ, Shucard, JL, & Shucard, DW. 2017. Event-related potential indices of cognitive dysfunction and brain resource reallocation during working memory in patients with Multiple Sclerosis. Clinical Neurophysiology, 128, 604-621.

Covey, TJ, Shucard, JL, & Shucard, DW. 2016. Evaluation of inhibitory control and distraction using event-related potentials in healthy individuals and patients with Multiple Sclerosis. In: Foundations of Augmented Cognition: Neuroergonomics and Operational Neuroscience. Lecture Notes in Computer Science, 9743, 165-176.

Shucard, DW, Covey, TJ, & Shucard, JL. 2016. Single trial variability of the P3 event-related potential as an index of neural efficiency during working memory. In: Foundations of Augmented Cognition: Neuroergonomics and Operational Neuroscience. Lecture Notes in Computer Science, 9743, 273-283.

Covey, TJ, Shucard, JL, Violanti, JM, Lee, J, & Shucard, DW. 2013. The effects of exposure to traumatic stressors on inhibitory control in police officers: A dense electrode array study using a Go/NoGo continuous performance task. International Journal of Psychophysiology, 87(3), 363-375.

Covey, TJ, Shucard, JL, Shucard, DW, Stegen, S, & Benedict, RHB. 2012. Comparison of neuropsychological involvement and vocational outcomes in Systemic Lupus Erythematosus and Multiple Sclerosis patients. Journal of the International Neuropsychological Society, 18(3), 541-555.

Covey, TJ, Zivadinov, R, Shucard, JL, & Shucard, DW. 2011. Information processing speed, neural efficiency, and working memory performance in Multiple Sclerosis: Differential relationships with structural MRI. Journal of Clinical and Experimental Neuropsychology, 33(10), 1129-1145.

Manuscripts under Review:

Covey, TJ, Shucard, JL, & Shucard, DW. Working memory training and perceptual discrimination training impact overlapping and distinct neurocognitive processes: Evidence from event-related potentials and transfer of training gains. In revision for Cognition.

Manuscripts in Preparation (listed in order of expected timeline to submit):

Shucard, JL, Chin, RHZ, Covey, TJ, & Shucard, DW. Perceptual task difficulty and inhibitory control during a go-nogo task: An event-related potential study. To be submitted to International Journal of Psychophysiology.

Kordovski, V, Shucard, DW, Covey, TJ, Adams, J, & Shucard, JL. Do neuropsychological tests of working memory, information processing speed, and memory span predict performance on a visual n-back task? In revision.

Covey, TJ, Shucard, JL, Wang, X, & Shucard, DW. Anteriorization of the P3 event-related potential component during an n-back working memory task in patients with Systemic Lupus Erythematosus. In preparation.

Conference Abstracts (Posters):

Meynadasy, MM, Covey, TJ, Shucard, JL, Violanti, JM, & Shucard, DW. Response priming and conflict processing in police officers with PTSD symptomatology: An event-related brain potential study. Presented at University at Buffalo Celebration of Academic Excellence, Buffalo; and at SUNY Undergraduate Research Conference, Fredonia, 2017.

Shucard, DW, Chin, R, Covey, TJ, & Shucard, JL. Perceptual task difficulty and inhibitory control during a Go-NoGo task: An event-related potential study. Presented at the 44th annual meeting of the Society for Neuroscience, Washington, 2014.

Solak, JM, Covey, TJ, Shucard, JL, & Shucard, DW. Event-related potentials altered in Multiple Sclerosis during a visual N-back task. Presented at the Ignasious Research Day, Canisius College, 2014.

Dixon, R, Shucard, J, Covey, T, & Shucard, DW. Working memory deficiencies in Neuropsychiatric Systemic Lupus Erythematosus. Presented at the CLIMB UP Research Symposium, University at Buffalo, 2013.

Kordovski, V, Shucard, J, Covey, T, Benedict, R, & Shucard, D. Electrophysiological indices of cognitive functioning and brain-behavior relationships in Systemic Lupus Erythematosus. Presented at the 2nd annual Brain and Behavior Sciences Symposium, University at Buffalo, 2013.

Covey, TJ, Shucard, JL, Lee, JT, Zivadinov, R, & Shucard, DW. Electrophysiological, behavioral, and structural indices of working memory dysfunction in Systemic Lupus Erythematosus. (Includes substantial additions from what was presented in poster at UB Neuroscience Research Day, 2011). Presented at the 42nd annual meeting of the Society for Neuroscience, New Orleans, 2012.

Ma, Y, Covey, TJ, Lee, JT, Shucard, JL, & Shucard, DW. An event-related brain potential study of encoding and retrieval during working memory in SLE. Presented at the 6th annual University at Buffalo Neuroscience Research Day, Buffalo 2012.

Kordovski, VM, Covey, TJ, Adams, JA, & Shucard, DW. N-back performance measures and their relationship to neuropsychological tests of cognitive function. Presented at the 6th annual University at Buffalo Neuroscience Research Day, Buffalo 2012.

Kandel, A, Ching, MI, Covey, TJ, & Shucard, DW. Timing of Mobile Cardiac Outpatient Telemetry May Increase Diagnostic Yield of Atrial Fibrillation in Select Patients with Cryptogenic Strokes. Presented at the International Stroke Conference, New Orleans 2012. Published abstract, Stroke, 2012.

Covey, TJ, Shucard, JL, Lee, JT, & Shucard, DW. Single trial variability of event-related brain potentials as an index of neural efficiency during information processing. Presented at the 41st annual meeting of the Society for Neuroscience, Washington 2011.

Lee, JT, Shucard, JL, Covey, TJ, & Shucard, DW. Stage effect on ERP topography during spatial working memory. Presented at the 5th annual University at Buffalo Neuroscience Research Day, Buffalo 2011.

Covey, TJ, Shucard, JL, Lee, JT, Zivadinov, R, & Shucard, DW. Brain structure and functional indices of working memory dysfunction in Systemic Lupus Erythematosus. Presented at the 5th annual University at Buffalo Neuroscience Research Day, Buffalo 2011.

Shucard, JL, Lee, J, Covey, TJ, Violanti, J, & Shucard, DW. Evidence of frontal dysregulation associated with heightened attention to task-irrelevant stimuli in police officers with high PTSD symptomatology: A dense electrode array ERP study. Presented at the 40th annual meeting of the Society for Neuroscience, San Diego 2010.

Shucard, DW, Chichelli, TL, Lee, W, Covey, T, Lee, J, & Shucard, J. ERP P3 amplitude change over trials during the performance of a working memory n-back task in older versus younger adults. Presented at the 49th annual meeting of the Society for Psychophysiological Research, Berlin 2009. Published abstract, Psychophysiology, 2010.

Covey, T, Shucard, DW, Zivadinov, R, Lee, W, Dwyer, M, & Shucard, J. Complex, not simple, processing speed is associated with working memory performance and structural MRI indices of brain damage in multiple sclerosis. Presented at the 39th annual meeting of the Society for Neuroscience, Chicago 2009; and the 3rd annual University at Buffalo Neuroscience Research Day, Buffalo 2009.