

BIOGRAPHICAL SKETCH

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NAME: Conley, Alexander C.

eRA COMMONS USER NAME (credential, e.g., agency login): conleac1

POSITION TITLE: Research Instructor, Center for Cognitive Medicine, Vanderbilt University Medical Center

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Newcastle, Newcastle, NSW, Australia	B. Psyc. (Hons)	12/2011	Psychology
University of Newcastle, Newcastle, NSW, Australia	Ph.D.	05/2017	Psychology
Vanderbilt University Medical Center, Nashville, TN, USA	Postdoctoral Fellowship	08/2019	Clinical Neuroscience

A. Personal Statement

I have a strong background in cognition and neuroscience, and have been working in this field for the past 7 years. I have conducted experiments examining translational changes in cognition and neuroscience across human subjects ranging from late adolescence to the elderly, and have examined both healthy and clinical populations, specifically focusing on neurodegenerative diseases. In these experiments I have gained extensive experience working with cognitive tasks and functional neuroimaging modalities, specifically electroencephalography, but also with structure magnetic resonance imaging. My graduate work focused on examining the efficacy of a novel brain stimulation mechanism at enhancing response processing across both healthy individuals and stroke patients. In addition to this project, I was also involved in examining the effect of cerebrovascular risk factors on white matter integrity and cognitive functioning in older adults from both Australian and Taiwanese samples. I started my postdoctoral fellowship at Vanderbilt University Medical Center 2 years ago. My research at VUMC has focused primarily on the development and implementation of a novel cholinergic agent for the treatment of Alzheimer's disease. I have also been involved in examining the impact of subjective cognitive complaints on objective cognitive performance and cortical atrophy in postmenopausal women, to identify at risk individuals for pathological cognitive decline. In addition to my research, I have also been involved in a number of clinical trials for Mild Cognitive Impairment, Alzheimer's disease and geriatric depression.

B. Positions and Honors**Positions and Employment**

2012-2016 Casual Academic Tutor, University of Newcastle, Australia
 2016-2019 Postdoctoral Research Fellow, Center for Cognitive Medicine, Vanderbilt University Medical Center
 2019- Research Instructor, Center for Cognitive Medicine, Vanderbilt University Medical Center

Other Experience and Professional Memberships

2012-2016 Member, Australasian Cognitive Neuroscience Society
 2012-2017 Member, Hunter Medical Research Institute, Newcastle, Australia
 2016-2017 Member, Society for Psychophysiological Research
 2017- Member, International Society to Advance Alzheimer's Research and Treatment, ISTAART

Awards and Honors

2015	University of Newcastle, Faculty of Science & IT, Outstanding Research Higher Degree Student
2015	Visiting fellowship award, National Cheng-Kung University, Tainan, Taiwan
2018	ADDF Young Investigator Scholarship, 19th International Conference on Alzheimer's Drug Discovery, July 2018

C. Contributions to Science

1. My early publications examined the efficacy of applying anodal transcranial direct current stimulation (tDCS) over the motor cortex in healthy younger and older adults, as well as in chronic stroke patients. The work examined whether tDCS was influencing response processes such as preparation, selection or execution. Rather than identifying a specific process that was enhanced, my research found that tDCS did not enhance performance. We were able to replicate this null finding across all subject groups, and across both cognitive experiments and EEG recordings. These findings contribute to a growing body of articles that have shown that tDCS failing to enhance cognitive and motor performance. The implications of these articles have led to more rigorous testing of outcomes in future studies examining tDCS.
 - a. Conley, A.C., Marquez, J., Parsons, M.W., Fulham, W.R., Heathcote, A. & Karayanidis, F. (2015). Anodal tDCS over the Motor Cortex on Prepared and Unprepared Responses in Young Adults. *PLOS One*, doi: 10.1371/journal.pone.0124509.
 - b. Marquez, J., Conley, A.C., Karayanidis, F., Lagopoulos, J. & Parsons, M.W. (2015). Anodal direct current stimulation in the healthy aged: effects determined by the hemisphere stimulated. *Restorative Neurology and Neuroscience*, 33, 509-519. doi: 10.3233/RNN-140490.
 - c. Conley, A.C., Fulham, W.R., Marquez, J.L., Parsons, M.W. & Karayanidis, F. (2016) No Effect of Anodal Transcranial Direct Current Stimulation Over the Motor Cortex on Response-Related ERPs during a Conflict Task. *Front. Hum. Neurosci.* 10:384. doi: 10.3389/fnhum.2016.00384
 - d. Marquez, J. L., Conley, A. C., Karayanidis, F., Miller, J., Lagopoulos, J., & Parsons, M. W. (2017). Determining the benefits of transcranial direct current stimulation on functional upper limb movement in chronic stroke. *International Journal of Rehabilitation Research*. doi: 10.1097/MRR.0000000000000220
2. A focus of my recent publications have focused on novel biomarkers and therapeutics of cognitive neurodegeneration. My first article on this topic was a review of new pharmacological treatments for neurodegenerative disorders, and the different approaches being undertaken. One of the more promising areas is the use of repurposed medication, such as transdermal nicotine, which we investigated in the treatment of treatment resistant late-life depression. We found from a small open-label study that nicotine was effective at improving affective symptoms in most subjects. Additionally, my research has also focused on developing a better understanding of which individuals are at the highest risk of developing a neurodegenerative disorder. This is increasingly important, as we look for preventative approaches. We found that increased levels of subjective cognitive complaints were associated with higher levels of the Alzheimer's disease biomarkers of beta-amyloid and phosphorylated tau.
 - a. Conley, A.C., & Newhouse, P.A. (2018) Advances in Drug Discovery and Development in Geriatric Psychiatry. *Current Psychiatry Reports*. 20:10. <https://doi.org/10.1007/s11920-018-0871-5>
 - b. Gandelman, J. A., Kang, H., Antal, A., Albert, K., Boyd, B. D., Conley, A. C., ... & Taylor, W. D. (2018). Transdermal Nicotine for the Treatment of Mood and Cognitive Symptoms in Nonsmokers With Late-Life Depression. *The Journal of clinical psychiatry*, 79(5).doi: 10.4088/JCP.18m12137
 - c. Shokouhi, S., Conley, A. C., Baker, S. L., Albert, K., Kang, H., Gwirtsman, H. E., ... & Alzheimer's Disease Neuroimaging Initiative. (2019). The relationship between domain-specific subjective cognitive decline and Alzheimer's pathology in normal elderly adults. *Neurobiology of ageing*, 81, 22-29. doi: <https://doi.org/10.1016/j.neurobiolaging.2019.05.011>

3. A final focus of my research has been investigating ways to improve the use of EEG in clinical research. Part of this research has examined different ways of referencing evoked potentials and how these changes affect the morphology of components. This allows for a better methodological understanding of the spatial resolution of relative referencing montages and how they might affect the conclusions that are drawn from an experiment. The other way that I have investigated EEG in clinical research is by conducting a systematic review of how EEG is used in sports-related concussion. In particular, we assessed the reliability of using resting state EEG as a marker of the severity of the impact, as well as the recovery from the impact. This systematic review found that there was a wide variety of approaches to recording and analyses among the prior literature, which affected the reliability of resting state EEG as a biomarker. The article ended with a set of recommendations for future use of resting state EEG in sports-related concussion research.
 - a. Wong, A.S.W., Cooper, P.S., Conley, A.C., McKewen, M., Fulham, W.R., Michie, P.T., & Karayanidis, F. (2018). Event-Related Potential Responses to Task Switching Are Sensitive to Choice of Spatial Filter. *Front. Neurosci.* 12:143. doi: 10.3389/fnins.2018.00143
 - b. Conley, A.C., Cooper, P.S., Karayanidis, F., Gardner, A.J., Levi, C.R., Stanwell, P., Gaetz, M.B., & Iverson, G.L. (2018). Resting state electroencephalography and sport-related concussion: A systematic review. *Journal of Neurotrauma*. DOI: 10.1089/neu.2018.5761

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

1. 20140501.03 (Newhouse, PI) 03/01/2016-12/31/2019
Phase 1 Multiple Ascending Dose Testing a Muscarinic M1PAM for Alzheimer's Disease. Sponsor: Alzheimer's Drug Discovery Foundation. This project funds multiple dose testing of the putative cognitive enhancer M1PAM VU319 in normal human volunteers.
Role: Co-I
2. 1R01 AG066159-01 (Dumas/Newhouse) 9/1/2019-8/31/2024
Health of the cholinergic system and risk for Alzheimer's disease in postmenopausal women. Sponsor: NIA.

Completed Research Support

1. PCTR-16-383171 (Newhouse, PI) 12/1/2015-11/30/2018
Phase 1 Single Ascending Dose Testing of a Muscarinic M1 PAM for Alzheimer's Disease. Sponsor: Alzheimer's Association. The purpose of this grant is to provide critical information for Phase 1 first-in-human studies of a new drug target and provide a highly optimized clinical research tool that can be used to advance M1 PAMs for treatment of Alzheimer's disease.
Role: Co-I
2. 201511 (Karayanidis, Conley, Co-PIs) 11/2015–11/2016
Conley, A.C., Karayanidis, F. & Hsieh, S. Assessing cardiovascular risk factors on cognition across ages. Sponsor: John and Daphne Keats Endowment Research Fund, School of Psychology, University of Newcastle. This grant supported work to setup a research project examining the impact of cardiovascular risk factors on cognitive functioning in a Taiwanese sample using a research protocol developed at the University of Newcastle.
Role: Co-PI