

Nicholas Christopher-Hayes

Curriculum Vitae

Doctoral Student

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EDUCATION

Degree: 2021 – PRSNT **PhD, Psychology, University of California Davis**

2011 – 2015 **Bachelor of Arts, Psychology, University of Wisconsin-Milwaukee**

Relevant Courses: Child Psychology, Psychological Statistics, Research Methods, Neuropsychology, Advanced Physiological Psychology, Cellular & Molecular Neuroscience, Brain Injury, Cognitive Neuroscience, Computer Science (Java 1), Computer Science (Java 2)

Senior Research Project: *Oculomotor capture by aversive stimuli*

PROFESSIONAL RESEARCH EXPERIENCE

MAD Lab: 2021 – PRSNT **PI: Dr. Simona Ghetti**
University of California Davis, Psychology
Doctoral Student

DICoN Lab: 2019 – 2021 **PI: Dr. Tony W. Wilson**
University of Nebraska Medical Center, Department of Neurological Sciences
MEG Research Associate
-Processing and analysis of Magnetic Resonance Imaging (MRI), Magnetoencephalography (MEG), Positron Emission Tomography (PET), Arterial Spin Labelling (ASL), and Electromyography (EMG) data
-Processing pipeline and toolbox development
-Computer and data management
-Lab wiki development and maintenance
-Research study and cognitive task development
-Manuscript and figure preparation for inclusion in scholarly conference presentations and publications

Warren Neuroscience Lab: 2016 – 2019 **PI: Dr. David E. Warren**
University of Nebraska Medical Center, Department of Neurological Sciences
Clinical Research Associate
-Participant data collection with MRI, MEG, Transcranial Magnetic Stimulation (TMS), computerized tasks, and Eye-tracking
-Data processing and quality control
-Computer and data management
-Develop and implement research study protocols
-Manuscript and figure preparation for inclusion in scholarly conference presentations and publications

MINDfull of Memory Lab: 2016 – 2019 **PI: Dr. Deborah E. Hannula**
University of Wisconsin-Milwaukee, Department of Psychology
Research Assistant
-Participant data collection with computerized tasks and Eye-tracking hardware
-Behavioral and Eye-tracking data analysis
-Present and lead discussion in weekly lab meetings

OTHER PROFESSIONAL EXPERIENCE

La Fleur Law
Office, S.C.: 2015 – 2016 **Firm Administrator**, Milwaukee, WI

2012 – 2015 **Law Clerk**, Milwaukee, WI

UWM Men's
Panther Soccer
Club: 2015 – 2016 **President**, Milwaukee, WI

FUNDED AWARDS SURF:

Support for Undergraduate Research Fellows, Summer 2015 (\$1,500), University of Wisconsin-Milwaukee

PUBLICATIONS

Published:

- **Christopher-Hayes, N. J.**, Lew, B. J., Wiesman, A. I., Schantell, M., O'Neill, J., May, P. E., Swindells, S., Wilson, T. W. (2021). Cannabis use impacts pre-stimulus neural activity in the visual cortices of people with HIV. *Human Brain Mapping*. [Public Link](#)
- Wiesman, A. I., **Christopher-Hayes, N. J.**, Wilson, T. W. (2021b). Stairway to memory: Left-hemispheric alpha dynamics index the progressive loading of items into a short-term store. *NeuroImage* 235, 118024. [Public Link](#)
- Warren, D. E., Rangel, A. J., **Christopher-Hayes, N. J.**, Eastman, J. A., Frenzel, M. R., Stephen, J. M., Calhoun, V. D., Wang, Y., Wilson, T. W. (2021). Resting-state functional connectivity of the human hippocampus in periadolescent children: Associations with age and memory performance. *Human Brain Mapping*. [Public Link](#)
- Wiesman, A. I., Murman, D. L., May, P. E., Schantell, M., Losh, R. A., Johnson, H. J., Willet, M. P., Eastman, J. A., **Christopher-Hayes, N. J.**, Knott, N. L., Houseman, L. L., Wolfson, S. L., Losh, K. L., Johnson, C. M., Wilson, T. W. (2021c). Spatio-spectral relationships between pathological neural dynamics and cognitive impairment along the Alzheimer's disease spectrum. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring* 13. [Public Link](#)
- Wiesman, A. I., **Christopher-Hayes, N. J.**, Eastman, J. A., Heinrichs-Graham, E., Wilson, T. W. (2021). Response certainty during bimanual movements reduces gamma oscillations in primary motor cortex. *NeuroImage* 224, 117448. [Public Link](#)
- Arif, Y., Wiesman, A. I., **Christopher-Hayes, N. J.**, Wilson, T. W. (2021). Aberrant inhibitory processing in the somatosensory cortices of cannabis-users. *Journal of Psychopharmacology*. [Public Link Coming Soon](#)

Under Review:

- Wiesman, A. I., Murman, D. L., Losh, R. A., Schantell, M., **Christopher-Hayes, N. J.**, Johnson, H. J., Willet, M. P., Wolfson, S. L., Losh, K. L., Johnson, C. M., May, P. E., Wilson, T. W. Spatially resolved neural slowing predicts impairment and amyloid burden in Alzheimer's disease. (*BRAIN*, 2021).

In prep:

- **Christopher-Hayes, N. J.**, Embury, C. M., Wiesman, A. I., May, P. E., Schantell, M., Johnson, C. M., Wolfson, S. L., Murman, D. L., Wilson, T. W. Piecing it together: hippocampal subfield profiles relate to cognitive impairment along the Alzheimer's disease spectrum.
- Picci, G., **Christopher-Hayes, N. J.**, Petro, N., Wilson, T. W. Brain mediated adaptation following trauma in typically developing youth: A preliminary study.
- Phipps, C. J., Rangel, A., **Christopher-Hayes, N. J.**, Phatak, V., Murman, D., Warren, D. E. Measuring brain and cognitive changes in memory systems after targeted multiday repetitive transcranial magnetic stimulation of healthy young, healthy old, and amnesic mild cognitive impairment(aMCI) participants.
- Phipps, C. J., **Christopher-Hayes, N. J.**, Torres-Russotto, D., Warren, D. E.. Measurement of functional brain network connectivity in people with orthostatic tremor using MRI and transcranial magnetic stimulation.

- **Christopher-Hayes, N. J.**, Embury, C. M., Wiesman, A. I., May, P. E., Schantell, M., Johnson, C. M., Wolfson, S. L., Murman, D. L., Wilson, T. W. (2021). Piecing it together: relationships between hippocampal subfields and cognitive impairment along the Alzheimer's disease spectrum. Alzheimer's Association International Conference.
- **Christopher-Hayes, N. J.**, Embury, C. M., Wiesman, A. I., May, P. E., Schantell, M., Johnson, C. M., Wolfson, S. L., Murman, D. L., Wilson, T. W. (2021). Hippocampal subfield profiles relate to cognitive impairment along the Alzheimer's disease spectrum. Organization for Human Brain Mapping.
- Jing, R., **Christopher-Hayes, N. J.**, Rangel, A. J., Murman, D. L., Warren, D. E. (2020). Effect of Targeted Transcranial Magnetic Stimulation on Memory Performance in Older Adults with Amnesic Mild Cognitive Impairment. Journal of the American Geriatrics Society.
- Phipps, C. J., Rangel, A., **Christopher-Hayes, N. J.**, Phatak, V., Murman, D. L., Warren, D. E. (2020). Measuring change in memory networks after targeted repetitive transcranial magnetic stimulation. Organization for Human Brain Mapping.
- Phipps, C. J., Rangel, A., **Christopher-Hayes, N. J.**, Phatak, V., Murman, D. L., Warren, D. E. (2019). Measuring brain and cognitive changes in memory systems after targeted multiday repetitive transcranial magnetic stimulation of healthy young, healthy old, and amnesic mild cognitive impairment (aMCI) participants. Alzheimer's Association International Conference.
- Ellis, D. G., White, M. L., Hayasaka, H., **Christopher-Hayes, N. J.**, Warren, D. E., Wilson, T. W., Aizenberg, M. R. (2019). Accurate localization of primary motor cortex in brain tumor patients with DTI and deep learning. Radiological Society of North America.
- Ellis, D. G., White, M. L., Hayasaka, H., **Christopher-Hayes, N. J.**, Warren, D. E., Wilson, T. W., Aizenberg, M. R. (2019). Reliability of Functional Neuroimaging for Prediction of Eloquent Brain Function as Determined by Intraoperative Mapping in Brain Tumor Patients. Radiological Society of North America.
- Datta, P., Samson, K. K., Warren, D. E., **Christopher-Hayes, N. J.**, Malgireddy K. R. (2019). Assessment of clinical and imaging characteristics in medically refractory epilepsy with poor surgical outcomes. American Epilepsy Society.
- Warren, D. E., **Christopher-Hayes, N. J.**, Rangel, A., Stephen, J. M., Calhoun, V. D., Wang, Y.-P., Wilson, T. W. (2018). Measuring the relationship between memory performance and hippocampal structure/function in periadolescent children: a longitudinal investigation from the Dev-CoG project. Nanosymposium. Society for Neuroscience.
- **Christopher-Hayes, N. J.**, Rangel, A., Stephen, J. M., Calhoun, V. D., Wang, Y.-P., Wilson, T. W., & Warren, D. E. (2017). Adolescent changes in hippocampal volume and functional connectivity affect memory performance. Organization for Human Brain Mapping.
- Spooner, R. K., **Christopher-Hayes, N. J.**, Stephen, J. M., Calhoun, V. D., Wang, Y.-P., Wilson, T. W., & Warren, D. E. (2017). Intrinsic functional connectivity of the striatum covaries with cognitive performance in adolescents. Organization for Human Brain Mapping.
- Spooner, R. K., **Christopher-Hayes, N. J.**, Stephen, J. M., Calhoun, V. D., Wang, Y.-P., Wilson, T. W., & Warren, D. E. (2017). Childhood development of behavioral and brain network changes related to basal ganglia: resting-state functional connectivity of striatal regions varies with performance on cognitive tasks in children. Cognitive Neuroscience Society.
- Hopkins, L. S., **Christopher-Hayes, N. J.**, Helmstetter, F. J., Hannula, D. E. (2016). Contingency awareness is not required for fear conditioned capture of attention. Visual Sciences Society. [Public Link](#)

- Phipps, C. J., **Christopher-Hayes, N. J.**, Torres-Russotto, D., Warren, D. E. (2019). Measurement of functional brain network connectivity in people with orthostatic tremor using MRI and transcranial magnetic stimulation. University of Nebraska Medical Center Annual Research Day.

- Pham, D., **Christopher-Hayes, N. J.**, Rangel, A., Stephen, J. M., Calhoun, V. D., Wang, Y.-P., Wilson, T. W., & Warren, D. E. (2017). Brain correlates of memory ability in youth. University of Nebraska Medical Center Summer Undergraduate Research Symposium.
- Sajja, K., **Christopher-Hayes, N. J.**, Warren, D. E., Madhavan, D. (2017). Predicting outcomes after corpus callosotomy using FreeSurfer for processing and analyzing pre-surgical MRI images. University of Nebraska Medical Center Annual Research Day.
- **Christopher-Hayes, N. J.**, Hopkins, L. S., Helmstetter, F. J., Hannula, D. E. (2016). Oculomotor capture by aversive stimuli. UW-Milwaukee Undergraduate Research Symposium.

INVITED TALKS

- **Christopher-Hayes, N. J.** Neuroimaging and Neurostimulation in Alzheimer's. (2017). Fremont Area Alzheimer's Collaboration.

SYSTEMS AND COMPUTING

Authored Packages:

- 1) **ArtifactScanTool (AST)** – A Matlab-based package for automated statistical identification, rejection, and plotting of artifactual MEG channels and epochs. Versions available for BESA and Brainstorm software packages. Download here
- 2) **PyStiMEP** – A Python-based package for automated neurostimulation event-related motor evoked potential (MEP) identification, extraction, and plotting
- 3) **Snapshot** – A Python-based package for basic financial management and monthly reporting

Software: **FreeSurfer, Brainstorm, FSL, ASHS, AFNI, SPM, Fieldtrip, 3D Slicer**

Hardware: **Siemens Prisma 3T MRI System, Elekta MEGIN MEG System, Eye-Trac 6, Eyelink 1000, Nexstim NBS 5.1**

Languages: **Python, Git, Bash/Shell, Matlab, Java, HTML**

Research Systems: **MoinMoin Wiki (Python/Linux)**

SCIENTIFIC COMMUNITY OUTREACH

- 2018 – 2019 *Science Education Outreach and Engagement Program*, UNMC Science Education Partnership Award (SEPA): Health and science education in Native American communities and The National Cancer Institute's Youth Enjoy Science Research Program (YES)
- 2016 – 2017 *Fremont Area Alzheimer's Collaboration*, Memory Walk
- 2014 & 2015 *Federal TRIO Program*, Upward Bound Math-Science
- 2012 – 2014 *New Horizons Un-Limited Inc.* - Independent Disabilities Advocacy and Rehabilitation Center for Computer Training, Refurbishing, and Workforce Preparation

CERTIFICATIONS

- 2014 – PRSNT TMS (NBS System 5.1), MRI Safety, CITI

RESEARCH REFERENCES

- Dr. Simona Ghetti** Professor and Vice-Chair for Undergraduate Education Department of Psychology and Center for Mind and Brain University of California, Davis One Shields Avenue Davis, CA 95616 sghetti@ucdavis.edu
- Dr. Tony W. Wilson** Patrick E. Brookhouser Endowed Chair in Cognitive Neuroscience Director, Institute for Human Neuroscience Boys Town National Research Hospital 14090 Mother Teresa Lane Boys Town, NE 68010 531-355-8909 tony.wilson@boystown.org
- Dr. Deborah E. Hannula** Associate Professor, Associate Chair, Department of Psychology University of Wisconsin-Milwaukee Garland Hall P.O. Box 413 Milwaukee, WI 53201 414-229-4158 hannula@uwm.edu
- Dr. Alex I. Wiesman** National Institutes of Health Postdoctoral Fellow Montreal Neurological Institute McGill University 3801 Rue University | Montréal, QC H3A 2B4 438-506-3709 aiwiesman@gmail.com