

Exponent®
Engineering & Scientific Consulting

Tara O'Connell, Ph.D.

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Professional Profile

Dr. Tara O'Connell (formerly Cornwell) is a biomechanical engineering expert and movement scientist specializing in human subject experiments. Her interdisciplinary background includes experimental design, mathematics, and data analysis, empowering Dr. O'Connell to effectively lead user studies and provide analytical solutions to complex challenges.

Prior to joining Exponent, Dr. O'Connell evaluated motor control and the biomechanics of gait in various clinical populations, including people with chronic stroke or incomplete spinal cord injury. Through this research, she gained experience designing novel experiments with sensors and real-time feedback mechanisms, developing custom analysis pipelines in Visual3D, MATLAB, and Python, and leveraging theoretical models and optimization tools to simulate movement dynamics. With three degrees in biomedical engineering, Dr. O'Connell is well-equipped and motivated to deliver human-centered solutions to a variety of technological or clinical challenges.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, University of Southern California, 2025

M.S., Biomedical Engineering, University of Southern California, 2024

B.S., Biomedical Engineering, Northwestern University, 2019

American Heart Association Predoctoral Fellowship, 2023-2024

Prior Experience

Graduate Student Researcher, University of Southern California, 2021-2025

Neuromechanical Research Engineer, Northwestern University, 2019-2021

Undergraduate Research Assistant, Northwestern University, 2017-2019

Professional Affiliations

American Society of Biomechanics (ASB)

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Publications

Cornwell T, Finley J. "Stroke impairs the proactive control of dynamic balance during predictable treadmill accelerations." Journal of The Royal Society Interface 2025; 22 (231).

Johnson RT, Cornwell T, Novotny R, Finley JM. "Joint-level contributions to reducing mechanical work during split-belt walking in older adults." Journal of Biomechanics 2025; 179, 112444.

Cornwell T, Novotny R, Finley JM. "Associations between asymmetry and reactive balance control during split-belt walking." Journal of Biomechanics 2024; 172, 112221.

Dusane S, Shafer A, Ochs WL, Cornwell T, Henderson H, Kim KYA, Gordon KE. "Control of center of mass motion during walking correlates with gait and balance in people with incomplete spinal cord injury." Frontiers in Neurology 2023; 14, 1146094.

Cornwell T, Woodward J, Ochs W, Gordon KE. "Stabilization strategies for fast walking in challenging environments with incomplete spinal cord injury." Frontiers in Rehabilitation Sciences 2021; 2, 709420.

Dragunas AC, Cornwell T, Lopez-Rosado R, Gordon KE. "Post-stroke adaptation of lateral foot placement coordination in variable environments." IEEE Transactions on Neural Systems and Rehabilitation Engineering 2021; 29, 731-739.

Ochs WL, Woodward J, Cornwell T, Gordon KE. "Meaningful measurements of maneuvers: People with incomplete spinal cord injury 'step up' to the challenges of altered stability requirements." Journal of Neuroengineering and Rehabilitation 2021; 18 (1), 46.

Cornwell T, Woodward J, Wu M, Jackson B, Souza P, Siegel J, Dhar S, Gordon KE. "Walking with ears: Altered auditory feedback impacts gait step length in older adults." Frontiers in Sports and Active Living 2020; 2, 38.

Presentations

Cornwell T, Finley JM. The influence of stroke on proactive balance control during walking. Podium presentation, American Society of Biomechanics, Madison, WI, 2024.

Cornwell T, Finley JM. Stroke impairs proactive balance control in response to predictable gait perturbations. Poster presentation, American Society of Neurorehabilitation, San Antonio, TX, 2024.

Cornwell T, Novotny R, Finley JM. Gait asymmetry affects reactive balance control during split-belt walking in neurotypical older adults. Poster presentation, Society for Neuroscience, San Diego, CA, 2022.

Cornwell T, Woodward J, Gordon KE. Motor adaptation during walking has limited translation to discrete stepping in incomplete spinal cord injury. Poster presentation, American Society of Biomechanics, 2021.

Cornwell T, Brown G, Woodward J, Gordon KE. Using movement amplification to explore the effect of walking speed on stability in iSCI. Poster presentation, American Society of Biomechanics, 2020.

Cornwell T, Woodward J, Jackson B, Wu M, Dhar S, Souza P, Siegal J, Gordon KE. The effects of hearing loss on gait stability in older adults. Poster presentation, American Society of Biomechanics, Rochester, MN, 2018.

Project Experience

Led large-scale user studies with consumer electronics.

Additional Education & Training

Adjunct Major in Global Health Studies, Northwestern University, 2019

Peer Reviews

Journal of Experimental Biology