

CURRICULUM VITAE

Natalia Sánchez, PhD
May 1, 2025

Chapman University
Department of Physical Therapy
Crean College of Health and Behavioral Sciences
Rinker Health Science Campus
9401 Jeronimo Rd. Irvine, CA 92618
Email: sanchezaldana@chapman.edu

ACADEMIC APPOINTMENTS

Assistant Professor (Tenure Track)
Director, Gait Behavior Laboratory

<https://www.gaitbehaviorlab.com/>

Crean College of Health and Behavioral Sciences; Physical Therapy
Chapman University
Irvine, CA 92618

August 2022 – Present

Assistant Professor (Affiliate)

Fowler School of Engineering; Electrical Engineering and Computer Science
Chapman University
Orange, CA 92703

January 2023 – Present

Assistant Professor of Research

Division of Biokinesiology and Physical Therapy
University of Southern California
Los Angeles, CA 90033

May 2019 – July 2022

EDUCATION

POST-GRADUATE TRAINING

University of Southern California

Graduate Certificate in Clinical, Biomedical and Translational Investigations
Keck School of Medicine, Department of Preventive Medicine

Los Angeles, CA
Sept. 2019 – Dec. 2020

University of Southern California

Postdoctoral research fellow, Biokinesiology and Physical Therapy
Advisor: James M. Finley

Los Angeles, CA
Sept. 2015 – April 2019

GRADUATE TRAINING

Northwestern University

Doctor of Philosophy, Biomedical Engineering, Neural Engineering Track
McCormick School of Engineering, Department of Physical Therapy and Human Movement Sciences
Advisor: Julius P.A. Dewald
Dissertation: Abnormal Static and Dynamic Joint Torque Patterns in the Lower Extremities of Individuals with Chronic Hemiparetic Stroke

Evanston, IL
September 2015

Northwestern University

Master of Science, Biomedical Engineering

Evanston, IL
December 2012

Natalia Sánchez, PhD.

McCormick School of Engineering

Thesis: A multiple-degree-of-freedom lower extremity isometric device to simultaneously quantify hip, knee, and ankle torques

UNDERGRADUATE TRAINING

Universidad EIA – Universidad CES

Bachelor of Science, Biomedical Engineering

Medellín, Colombia

January 2008

Rehabilitation Institute of Chicago

Undergraduate Research Assistant

Chicago, IL

January – June 2007

SCHOLARLY ACTIVITY – FUNDING RECEIVED

Ongoing Research Support

NIH NCMRR R03HD107630

06/01/2023-05/31/2025

“Determining the effects of increased demands for voluntary adjustments on the neuromuscular control of walking post-stroke”

Aim: This proposal will assess changes in muscle activation patterns associated with walking adaptations driven explicitly vs. implicitly, to determine which tasks can lead to effective walking adaptations and underlying muscle activation patterns.

Role: **Principal Investigator**

Amount: \$200,000 (direct costs)

NIH NCATS R03TR004248

07/08/2022-04/30/2024

(No cost extension 04/30/2025)

“A precision medicine approach to identify walking phenotypes and rehabilitation targets after injury”

Aim: Identify kinetic, kinematic and muscle level subtypes of walking impairment to inform more targeted intervention prescription.

Role: **Principal Investigator**

Amount: \$100,000 (direct costs)

Completed Research Support

NIH NCMRR R03HD104217-01

05/01/2021-04/30/2023

“A novel, comprehensive approach to post-stroke gait rehabilitation”

Aim: Determine the feasibility and optimal parameters of a combined biofeedback- and intensity-based gait training approach in persons post-stroke.

Role: Consultant (PI Kristan Leech USC)

Amount: 0.2 Person months

NIH NCATS KL2TR001854

06/01/2019-05/31/2022

“Development and application of big data techniques to gait analysis: dissociating recovery from compensation during gait in individuals post-stroke”

Aim: we propose to develop a large, longitudinal stroke gait database to which we can apply scientifically sound machine-learning algorithms. This will allow the identification of gait patterns that could be used to predict locomotor recovery in a prospective, observational study.

Role: Institutional Scholar (Siegel PI)

Amount: \$300,000 (direct costs)

5/1/2025

Natalia Sánchez, PhD.

NIH NCMRR P2CHD065702

07/01/2020-06/30/2021

Center for Large Data Research & Data Sharing in Rehabilitation (CLDR) Pilot Project Program
"Stroke Initiative for Gait Data Evaluation (STRIDE)"

Aim: STRIDE is an initiative based at the University of Southern California to create an inter-institutional, public database containing de-identified demographic and kinematic, kinetic, and spatiotemporal measures assessed via gait analysis in individuals post-stroke, to provide a larger and more heterogeneous research dataset than that typically amassed at a single institution.

Role: Pilot project award PI (Ottenbacher PI)

Amount: \$10,000

SC CTSI Research Voucher

01/2020-12/2020

Use of automated trial promoter for participant recruitment via social media

Role: Principal Investigator

Amount: \$3,000

USC CTSI Clinical Research Pilot Award

06/01/2018-05/31/2019

"Clinical and Behavioral Assessment of Fall Risk during Walking in People Post-Stroke"

The aims of this pilot study are to: 1) establish the validity of an objective biomechanical assessment of fall risk that directly measures a patient's ability to recover from a loss of balance; 2) determine which patient-specific physical and psychological factors are associated with measures of fall risk; and 3) determine if shifting a patient's walking pattern toward the typical pattern observed in healthy individuals leads to improvements in balance.

Role: Co-Investigator (James Finley PI)

Amount: \$40,000

American Heart Association

06/01/2016-05/31/2018

Post-doctoral Fellowship 16POST29610000

"Is asymmetry optimal? Characterization of Individual Differences in the Metabolic Cost of Asymmetry Post-Stroke"

The primary objective of this project was to understand how short-term, biofeedback-based interventions aimed at improving walking symmetry affect the energy cost of walking in people post-stroke.

Role: **Principal Investigator** – Post-doctoral Fellow (James Finley mentor, Carolee Winstein co-mentor)

Amount: \$98,950 (direct costs)

American Heart Association

01/01/2013-12/31/2014

Pre-doctoral Fellowship 13PRE14690048

Lower Extremity Synergies After Hemiparetic Stroke

Aim: The primary objective of this project was to characterize changes in the voluntary control of the lower extremity post-stroke.

Role: **Principal Investigator** – Pre-doctoral Fellow (Jules Dewald mentor)

Amount: \$52,000 (direct costs)

AWARDS

Judge Travel Award to the Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) (2023)

Training in Grantsmanship for Rehabilitation Research (TIGRR) (2021)

TIGRR Workshop is funded by NIH/NICHHD grant number 2R25HD074546-07.

Natalia Sánchez, PhD.

Summer Program in Data Curation for Rehabilitation Research and Related Clinical Trials offered by the Inter-university Consortium for Political and Social Research (ICPSR) (2018)
Full Scholarship

Society for the Neural Control of Movement (2018)
Under-represented minorities' diversity fellowship

Honors Student - Escuela de Ingeniería de Antioquia – Universidad CES (2008)

PUBLICATIONS

* Indicates trainee

Manuscripts in preparation (full draft)

N Sánchez, J Stenum. Calculating the Center of Mass Velocity and the Constraints of Split-Belt Treadmill Walking

Manuscripts under review

N Sánchez, A Kuch*, SN. Jeffcoat*, A Hooyman, A Haver-Hill, M Bonilla-Yanez, CK. Holl, KA. Leech. The differential effects of fast walking speed on muscle coactivation in the paretic and non-paretic extremities post-stroke.

A Kuch*, A McKenzie, N Schweighofer, JM. Finley, Y Wen, **N Sánchez**, Identification of distinct subtypes of post-stroke and neurotypical gait behaviors using neural network analysis of kinematic time series data. <https://www.biorxiv.org/content/10.1101/2024.10.28.620665v1> . IEEE Trans Neural Syst Rehabil Eng (R&R).

S.N. Jeffcoat*, A. Aragon*, A. Kuch*, S. Farrokhi, **N. Sánchez**. Perception of task duration influences metabolic cost during split-belt adaptation. (2024) <https://biorxiv.org/cgi/content/short/2024.05.24.595558v1>.

Published Peer-Reviewed Manuscripts

SA. Brinkerhoff, **N Sánchez**, MN Culver, WM Murra, AT Robinson, JD McCullough, MW Miller, JA Roper. The dual timescales of gait adaptation: Initial stability adjustments followed by subsequent energetic cost adjustments. Journal of Experimental Biology (2024). IF: **2.9**

N Sánchez, N Schweighofer, SJ. Mulroy, RT. Roemmich, TM. Kesar, G Torres-Oviedo, BE. Fisher, JM. Finley, CJ. Winstein. Multi-Site Identification and Generalization of Clusters of Walking Behaviors in Individuals With Chronic Stroke and Neurotypical Controls, Neurorehabilitation and Neural Repair (2023). <https://doi.org/10.1177/15459683231212864>. IF: **4.895**

SA. Brinkerhoff, **N Sánchez***, JA. Roper. Weekly exercise affects gait adaptation in healthy young adults. PLOS One, (2023), <https://doi.org/10.1371/journal.pone.0286649>. ***Co-Senior Author**. IF **3.752**.

SJ. Abram, KL. Poggensee, **N. Sánchez**, SN. Simha, JM. Finley, SH. Collins, and JM Donelan. General variability leads to specific adaptation toward energy optimal policies. Current Biology (2022), <https://doi.org/10.1016/j.cub.2022.04.015>. IF **10.9**

N Sánchez, N Schweighofer, JM Finley. Different biomechanical variables explain within-subjects versus between-subjects variance in step length asymmetry post-stroke. IEEE Trans Neural Syst Rehabil Eng. 2021;29:1188-1198. doi: 10.1109/TNSRE.2021.3090324. IF **4.528**

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S Park, C Liu, **N Sánchez**, JK. Tilson, SJ. Mulroy, and JM. Finley. Using biofeedback to reduce spatiotemporal asymmetry impairs dynamic balance in people post-stroke. *Neurorehabil Neural Repair*. 2021 Jun 1;15:459683211019346. doi: 10.1177/15459683211019346. IF: **4.895**

N Sánchez, CJ Winstein. Lost in translation: simple steps in experimental design of neurorehabilitation-based research interventions to promote motor recovery post-stroke. *Front Hum Neurosci*. 2021;15:644335. doi: 10.3389/fnhum.2021.644335. IF **3.473**

N Sánchez, S Simha, JM Donelan, JM Finley. Using asymmetry to your advantage: learning to acquire and accept external assistance during prolonged split-belt walking. *J Neurophysiol*. 2021 Feb 1;125(2):344-357. doi: 10.1152/jn.00416.2020. IF **2.714**

N Sánchez, S Simha, JM Donelan, JM Finley. Taking advantage of external mechanical work to reduce metabolic cost: the mechanics and energetics of split-belt treadmill walking. *J Physiol*. 2019 Aug;597(15):4053-4068. doi: 10.1113/JP277725. IF **5.5**

F Pozzi, HA Plummer, **N Sánchez**, Y Lee, LA Michener. Electromyography activation of shoulder and trunk muscles is greater during closed chain compared to open chain exercises. *J Electromyogr Kinesiol*. 2019 May 12; 102306. doi: 10.1016/j.jelekin.2019.05.007. IF **2.641**

N Sánchez, AM Acosta, R Lopez-Rosado, JPA Dewald. Neural Constraints Affect the Ability to Generate Hip Abduction Torques When Combined with Hip Extension or Ankle Plantarflexion in Chronic Hemiparetic Stroke. *Front Neurol*. 2018;9:564. doi: 10.3389/fneur.2018.00564. IF **3.4**

N Sánchez, JM Finley. Individual Differences in Locomotor Function Predict the Capacity to Reduce Asymmetry and Modify the Energetic Cost of Walking Post-Stroke. *Neurorehabil Neural Repair*. 2018 Aug;32(8):701-713. doi: 10.1177/1545968318787913. IF: **4.895**

N Sánchez, S Park, JM Finley. Evidence of Energetic Optimization during Adaptation Differs for Metabolic, Mechanical, and Perceptual Estimates of Energetic Cost. *Sci Rep*. 2017 Aug 9;7(1):7682. doi: 10.1038/s41598-017-08147-y. IF: **4.996**

N Sánchez, AM Acosta, R Lopez-Rosado, AHA Stienen, JPA Dewald. Lower Extremity Motor Impairments in Ambulatory Chronic Hemiparetic Stroke: Evidence for Lower Extremity Weakness and Abnormal Muscle and Joint Torque Coupling Patterns. *Neurorehabil Neural Repair*. 2017 Sep;31(9):814-826. doi: 10.1177/1545968317721974. IF: **4.895**

N Sánchez, AM Acosta, AHA Stienen, JPA Dewald . A multiple degree of freedom lower extremity isometric device to simultaneously quantify hip, knee, and ankle torques. *IEEE Trans Neural Syst Rehabil Eng*. 2015 Sep;23(5):765-75. doi: 10.1109/TNSRE.2014.2348801. IF **4.528**

Published Datasets

Sánchez N, Stroke Initiative for Gait Data Evaluation (STRIDE), [United States], 2012-2020. Inter-university Consortium for Political and Social Research [distributor], 2021-06-21. <https://doi.org/10.3886/ICPSR38002.v1>

Conference Proceedings

N Sánchez, JPA Dewald. Constraints imposed by the lower extremity extensor synergy in chronic hemiparetic stroke: Preliminary findings. *Annu Int Conf IEEE Eng Med Biol Soc*. 2014;2014:5804-7. doi: 10.1109/EMBC.2014.6944947

ABSTRACTS

Natalia Sánchez, PhD.

* Indicates trainee

Conference presentations – Platforms

RT. Johnson, J Anderson, and **N Sánchez**. Musculoskeletal modeling and predictive simulation explain heterogeneous gait patterns post-stroke. XX International Symposium on Computer Simulation in Biomechanics, Uppsala, Sweden 2025.

JA Smith, **N Sánchez**, N Ferreira, SN Jeffcoat*, S Sigward, S Farrokhi. Differences in Running-Related Injury Rates and Training Habits between Young and Masters Runners. APTA Combined Sections Meeting, Houston, TX, February 2025.

N Sánchez, S Schaefer. Promoting Inclusion in Neurorehabilitation Research. Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS). Phoenix, AZ, November 2023.

SA. Brinkerhoff, **N Sánchez**, and JA. Roper. Weekly Exercise Amount Affects Gait Adaptation in Healthy Young Adults. American Society of Biomechanics, Virtual Conference 2021.

N Sanchez, SN. Simha, JM Donelan, and JM. Finley. Using Visual Guidance to Acquire Work From the Treadmill During Split-belt Walking Does Not Accelerate Adaptation. American Society for Biomechanics, Virtual Conference 2020.

N Sanchez, SN. Simha, JM Donelan, and JM. Finley. Is more better? Evaluating the role of time in energy optimization during split-belt adaptation. Dynamic Walking. Canmore, Alberta. Canada 2019.

C Liu, S Park, **N Sánchez**, JK. Tilson, SJ. Mulroy, and JM. Finley. Asymmetries in the Reactive Control of Angular Momentum during Post-stroke Gait. International Society for Biomechanics. Calgary, Alberta. Canada. July, 2019

S Park, C Liu, **N Sánchez**, JK. Tilson, SJ. Mulroy, and JM. Finley. Impact of Modifying Spatiotemporal Asymmetry on Dynamic Balance during Walking Post-Stroke. Calgary, Alberta. Canada. July, 2019

F Pozzi, HA Plummer, **N Sánchez**, Y Lee, LA Michener. Closed chain exercises of the upper extremity elicit greater activation of shoulder and trunk muscles. Combined Sections Meeting, Washington, DC 2019.

N Sánchez, S Simha, JM Finley, JM Donelan. Exploiting Asymmetry to Gain Assistance during Split-belt Treadmill Walking. Advances in Motor Learning & Motor Control. San Diego, CA. November, 2018

N Sánchez, Simultaneous dimensionality reduction and regression to draw inference in gait analysis: an application to understanding gait asymmetry post-stroke. Submitted for World Congress of Biomechanics. Dublin, Ireland. July 2018.

N Sánchez, S Simha, JM Finley, JM Donelan. Experimental Analysis and Model-Based Predictions of Work Minimizing Strategies for Split-belt Walking. Dynamic Walking, Pensacola, FL 2018.

J.M. Finley, Chang Liu, and **N. Sanchez**. Mapping the Influence of Spatiotemporal Asymmetries on Energetic Cost and Reactive Balance during Walking. Dynamic Walking Conference in Mariehamn, Sweden. 2017.

N Sanchez. “Explicit modification of step length asymmetry transfers to over-ground walking post-stroke”. American Society of Biomechanics, Boulder, CO 2017.

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N Sánchez. “Volitional Coupling of Hip Extension with Hip Abduction is Altered Post-Stroke”. World Congress of Biomechanics. Boston, MA. July 2014. Invited Speaker.

N Sánchez. “Spontaneous Extension-Adduction Coupling in the Post-Stroke Lower Extremity: Implications for Rehabilitation”. Biomedical Engineering Society Annual Meeting. Seattle, WA. September 2013.

Conference presentations – Peer-reviewed abstracts (Posters)

SN. Jeffcoat*, A Kuch*, A Hooyman, A Haver-Hill, M Bonilla-Yanez, CK. Holl, KA. Leech, **N Sánchez.** The differential effects of fast walking speed on muscle coactivation in the paretic and non-paretic extremities post-stroke. American Society for Neurorehabilitation. Annual conference. Atlanta, GA, 2025.

JA Smith, **N Sánchez,** N Ferreira, SN Jeffcoat*, S Sigward, S Farrokhi. The Association between Pain Sensitivity, Fear Avoidance, and Pain Catastrophizing in Runners. APTA Combined Sections Meeting, Houston, TX February 2025.

P. Brown, L. Tierney, **N. Sánchez.** Parkinson's Boot Camp integrated into a DPT Curriculum: An inter-professional Learning Model. APTA Educational Leadership Conference, Oakland CA, 2024.

A Kuch*, K Leech, N Schweighofer, C Winstein, **N Sánchez,** The Impact of Lower Extremity Motor Impairment on Post-Stroke Coactivation in Gait. American Society of Biomechanics. Madison WI, 2024

S.N. Jeffcoat*, A. Kuch*, R.T. Johnson, **N. Sánchez.** Expert split belt walkers? Gait biomechanics and energetics over ten days of adaptation. American Society of Biomechanics. Madison WI, 2024

A Aguirre-Ramirez*, A Kuch*, **N Sánchez.** Minimal detectable change in spatiotemporal gait parameters during treadmill walking in stroke survivors. American Society of Biomechanics. Madison WI, 2024

A Cain, S Kettlety, **N Sánchez,** J Finley, K Leech. Overall gait asymmetry is associated with the metabolic cost of walking in individuals with chronic stroke. American Society for Neurorehabilitation. Annual conference. San Antonio, TX, 2024.

A Kuch*, A McKenzie, N Schweighofer, JM. Finley, Y Wen, **N Sánchez,** Time series clustering using gait kinematics can distinguish between neurotypical controls and subgroups of gait behaviors post-stroke. American Society for Neurorehabilitation. Annual conference. San Antonio, TX, 2024.

S.N. Jeffcoat*, A. Aragon*, A. Kuch*, S. Farrokhi, **N. Sánchez.** Perception of task duration impacts locomotor patterns and energy expenditure during split-belt adaptation and de-adaptation. American Society for Neurorehabilitation. Annual conference. San Antonio, TX, 2024.

A Haver-Hill, SA Kettlety, **N Sanchez,** KA. Leech. Comprehensive Gait Asymmetry Metrics Relate to Gait Speed and Not Motor Impairment. American Society of Biomechanics, Knoxville TN, 2023.

N Sánchez, N Schweighofer, SJ. Mulroy, RT. Roemmich, TM. Kesar, G Torres-Oviedo, BE. Fisher, JM. Finley, CJ. Winstein. Multi-site generalization of clusters of walking impairment in individuals with chronic stroke. American Society for Neurorehabilitation. Annual conference. Charleston, SC, 2023.

N Sánchez, N Schweighofer, SJ. Mulroy, RT. Roemmich, TM. Kesar, G Torres-Oviedo, BE. Fisher, JM. Finley, CJ. Winstein. Multi-site identification of phenotypes of locomotor impairment in individuals with chronic stroke. APTA Combined Sections Meeting. San Antonio TX, Feb 2022 (withdrawn due to COVID pandemic).

N Sánchez, N Schweighofer, JM Finley. Between vs. Within-Subject Predictors of Step Length Asymmetry Post-Stroke: One Predictor Does Not Fit All. American Society for Neurorehabilitation. Virtual conference. 2021
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N Sánchez. Combined dimensionality reduction and regression to identify correlates of step length asymmetry post-stroke. Society for the Neural Control of Movement, Santa Fe, NM, May 2018.

T Sukal-Moulton, **N Sánchez**, JPA Dewald. Simultaneous isometric joint torques measurement in the lower extremities of children and adults. American Academy for Cerebral Palsy and Developmental Medicine. Montreal, Canada. September 2017.

N Sánchez, S Park, J.M. Finley. Symmetry is Not Always Optimal: Mapping the Metabolic Cost Landscape of Walking on a Split-belt Treadmill. Society for the Neural Control of Movement. Montego Bay, Jamaica. April 2016. (Poster presentation).

S Park, **N Sánchez**, J.M. Finley. Modifying Adaptive Locomotor Learning using Body Weight Support. Society for the Neural Control of Movement. Montego Bay, Jamaica. April 2016. (Poster presentation).

R. Lopez-Rosado, **N Sánchez**, S. Adkins, M. Gordon, C. Montejano, JPA. Dewald. "Does Supine vs. Standing Posture Change Joint Torque Coupling Patterns in the Paretic Lower Extremity?" American Physical Therapy Association (APTA) Combined Sections Meeting. Las Vegas, NV. February 2014. (Poster presentation).

Conference presentations – Non peer-reviewed abstracts (Posters)

N Sánchez, JM Donelan, J.M. Finley. Guided exploration of energetic cost during split belt walking influences locomotor adaptation. Society for Neuroscience – Annual Meeting, San Diego CA, November 2022 (Poster presentation).

N Sánchez, SN Simha, JM Donelan, J.M. Finley. Prolonged exposure to split-belt walking promotes energy optimization during locomotor adaptation. Society for Neuroscience – Annual Meeting, Chicago IL, October 2019. (Poster presentation).

C. Liu, S. Park, **N. Sánchez**, J.K. Tilson, S.J. Mulroy, and J. M. Finley (2019), Altering Spatiotemporal Asymmetry Influences the Reactive Control of Balance During Walking in People Post-stroke. Society for Neuroscience – Annual Meeting, Chicago IL, October 2019. (Poster presentation).

S. Park, C. Liu, **N. Sánchez**, J.K. Tilson, S.J. Mulroy, and J. M. Finley (2019), Impact of Modifying Spatiotemporal Asymmetry on Frontal Plane Whole-body Angular Momentum during Walking Post-stroke. Society for Neuroscience – Annual Meeting, Chicago IL, October 2019. (Poster presentation).

JM. Finley, **N Sánchez**, CJ Winstein Y Gerasimenko, D Sayenko, VR Edgerton. Transcutaneous spinal stimulation modulates overground walking performance in individuals post-stroke. Society for Neuroscience – Annual Meeting, Chicago IL, October 2019. (Poster presentation).

Y Gerasimenko, D Sayenko, **N Sánchez**, JM. Finley, VR Edgerton. Transcutaneous spinal cord stimulation facilitates stepping performance in stroke patients. Society for Neuroscience – Annual Meeting, Chicago IL, October 2019. (Poster presentation).

N Sánchez, L Trejo, J.M. Finley. The capacity to modify asymmetry and reduce metabolic cost in people post-stroke depends on the direction of baseline asymmetry. Society for Neuroscience – Annual Meeting, Washington DC. November 2017. (Poster presentation).

N Sánchez, S Park, J.M. Finley. Perceptual, physiological and neuromechanical correlates of effort associated with step-length manipulations during split-belt walking. Society for Neuroscience – Annual Meeting, San Diego, CA. November 2016. (Poster presentation).

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N. Sánchez, A.C. Dragunas, K.E. Gordon, J.P.A. Dewald. Effects of Abnormal Post-Stroke Extension/Adduction Coupling in the Lower Extremity During Gait Initiation: Preliminary Results. Society for Neuroscience – Annual Meeting, Chicago, IL. October 2015. (Poster presentation).

Hurley D, Hruby S, Joshi, Kang HW, Thompson CK, Miller LC, **Sanchez N**, Powers RK, Negro F, Farina D, Dewald JP, Heckman CJ. Mapping the discharge of motor unit populations in the human lower extremity. Society for Neuroscience – Annual Meeting, Chicago, IL. October 2015. (Poster presentation).

J. Yao, **N. Sánchez**, M. Owen, C. Carmona, J. Sullivan, JPA. Dewald. Sensorimotor Changes After an Intervention Using a Novel Assistive System – Rein Hand: A Case Report. American Society for Neurorehabilitation, Chicago, IL 2015. (Poster presentation).

N Sánchez, JPA Dewald. “Effect of paretic ankle plantarflexion in spontaneous and voluntary joint torque coupling patterns”. Society for Neuroscience – Annual Meeting, Washington, DC. November 2014. (Poster presentation)

MA Owen, **N Sánchez**, JPA Dewald. “Cortical representation in the internal capsule in chronic stroke: preliminary results from a diffusion tensor study”. Society for Neuroscience – Annual Meeting, San Diego, CA. November 2013. (Poster presentation)

N Sánchez, R Lopez-Rosado, JPA Dewald. “Increased hip adductor, as opposed to reduced hip abductor activity, may explain hip abductor weakness during isometric hip extension in the paretic lower extremity following stroke”. Society for Neuroscience – Annual Meeting, San Diego, CA. November 2013. (Poster presentation).

N Sánchez, JPA Dewald. “Preliminary evidence for hip extension-adduction joint torque coupling in the lower extremity post-stroke”. Society for Neuroscience – Annual Meeting, New Orleans, LA. October 2012. (Poster presentation).

N Sánchez, RL Hawe, JPA Dewald. “Assessment of reproducibility and sensitivity of corticospinal tract DTI derived metrics in stroke”. Society for Neuroscience – Annual Meeting, San Diego, CA. November 2010. (Poster presentation).

RL Hawe, **N Sánchez**, JPA Dewald. “Reliability of Diffusion Tensor Imaging Measures in Subjects with and without Stroke”. Annual Meeting of the Organization for Human Brain Mapping. Barcelona, Spain. June 2010. (Poster presentation).

University Presentations (Posters)

H. Hashiguchi, R. Berns, **N. Sánchez**. Reliability of Metabolic Cost Measurements During Treadmill Walking Across Specific Time Intervals. Chapman University Undergraduate Symposium. Fall 2024 (poster presentation)

A. Aguirre-Ramirez*, A Kuch*, **N Sánchez**. Minimal detectable change in spatiotemporal gait parameters during treadmill walking in stroke survivors. Chapman University Undergraduate Symposium. Spring 2024 (poster presentation)

A. Aragon*, S.N. Jeffcoat *, A. Kuch*, **N. Sánchez**. Perception of task duration and differences in sex affects energetic cost during locomotor adaptation. Chapman University Undergraduate Symposium. Spring 2024 (poster presentation)

L Corona, J Cota, E Heisterkamp, B Nakano, R Wingen, J Yeung, **N Sanchez**. These Belts Are Made for Walking: Impact of Knowledge of Task Duration on Energy Expenditure and Gait Symmetry during Split Belt

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Treadmill Adaptation. Presented at Chapman University, Department of Physical Therapy Research Day. April 1, 2024 (poster presentation)

L Graham, M Howard, J Malloy, K McCarthy, M Vasquez, **N Sánchez**. Impact of Knowledge of Walking Duration on Physiological Effort and Energy Expenditure on a Split Belt Treadmill - A Single-Blind Study Presented at Chapman University, Department of Physical Therapy Research Day. December 5, 2023 (poster presentation)

INVITED TALKS AND PRESENTATIONS

Fowler School of Engineering Seminar Series, Chapman University

Identification of factors that shape healthy and pathological walking patterns, February, 2024

University of California Irvine Stroke Research Rehab Network Workshop

One size does not fit all: quantifying behavioral subgroups post-stroke to guide research interventions, April 2023

American Society for Neurorehabilitation – Career development seminar series

Identifying Funding Opportunities, March 2023.

Purdue University. Department of Health and Kinesiology.

Determining the factors that shape healthy and pathological walking patterns. March 2022

University of Texas – Austin. Department of Kinesiology and Health Education.

Determining the factors that shape healthy and pathological walking patterns. January 2022

University of Pittsburgh – Carnegie Mellon University, Center for the Neural Basis of Cognition (CNBC)

Early Career Research Seminar Series - underrepresented/minority neuroscientists. What We Have Learned from Assessing the Energetics of Adaptation to Split-Belt Walking. December 2020.

University of Colorado – Boulder, Department of Integrative Physiology IPHY Colloquium

It Pays to Walk Asymmetrically: What We Have Learned from Assessing the Energetics of Adaptation to Split-Belt Walking. November 2020

Division of Biokinesiology and Physical Therapy Neurorehabilitation Seminar.

Is More Better? Evaluating the Role of Experience in Energy Optimization during Split-Belt Adaptation. Los Angeles, CA, September 2019.

California Physical Therapy Association.

Cutting Edge Evidence: Everything a Practicing Clinician Needs to Know to Improve Outcomes After Stroke. Split-belt training after stroke and FES+Fast walking. Case presentation on exploration after stroke. Long Beach, CA. April 2019.

WORKSHOPS, COURSES AND CERTIFICATES

- Chapman Center for Excellence in Teaching and Learning – Bridging the Readiness Gap: A Roadmap for Empowering Student Success (January 2024)
- Chapman Office of Diversity, Equity, and Inclusion – Safe Space Workshop (June 2024)
- Chapman Center for Excellence in Teaching and Learning – Inclusive teaching certificate (January 2024)
- American Red Cross – Basic Life Support Certification (March 2023)

Natalia Sánchez, PhD.

- Chapman University Mindfulness Certificate (October – November 2023)
- American Physical Therapy Association Academy of Education Physical Therapy Faculty Development Workshop (July 2023)
- Summer Program in Data Curation for Rehabilitation Research and Related Clinical Trials offered by the Inter-university Consortium for Political and Social Research (ICPSR) (July 2018)

TEACHING EXPERIENCE

Chapman University

- PT651: Scientific Inquiry II (statistics) Fall 2022 - Present
Course Director/ Instructor. 2.5 contact hours per week
Doctorate in Physical Therapy Program. Department of Physical Therapy, Chapman University
- PT511: Biomechanics Fall 2022 - Present
Instructor. 2 contact hours per week
Doctorate in Physical Therapy Program. Department of Physical Therapy, Chapman University
- PT650: Scientific Inquiry I (foundations of clinical research) Fall 2022
Course Director/ Instructor. 2.5 contact hours per week
Doctorate in Physical Therapy Program. Department of Physical Therapy, Chapman University

University of Southern California

- BKN610: Technology in Sport: Field Assessment of Athletic Performance Spring 2018 – 2022
Course Director/ Instructor. 2 contact hours per week
MS in Biokinesiology with Emphasis in Sports Science. Division of Biokinesiology and Physical Therapy, University of Southern California
- PT534: Functional Neuroanatomy Fall 2018 – 2021
Course and Lab Instructor. 10 contact hours per week
Doctorate in Physical Therapy Program. Division of Biokinesiology and Physical Therapy, University of Southern California
- NGP100: Matlab Programming Bootcamp Summer 2019
Instructor. 40 Contact Hours
Neuroscience Graduate Program. University of Southern California

Northwestern University

- Biophysical Signal Processing Winter 2012, 2014
Teaching Assistant. Northwestern University's Interdepartmental Neuroscience Program
- Neuroanatomy Laboratory Winter 2013
Lab Instructor. Department of Physical Therapy and Human Movement Sciences, Northwestern University
- Advanced Systems Physiology: Neuroscience Fall 2010
Teaching Assistant. Department of Biomedical Engineering, Northwestern University

Natalia Sánchez, PhD.

RESEARCH MENTORING AND ADVISING

Post-Doctoral Fellows

Andrian Kuch, PhD Post-doctoral Fellow, Gait Behavior Lab Chapman University Next position: Post-Doctoral Fellow University of Quebec	Fall 2023 – Sum. 2025
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Pre-doctoral Fellows

Sebastian Correa PhD Student Biomedical Engineering – Case Western Reserve University Mentor – PI: James Sulzer	Spring 2023 – Present
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Research Assistants

Rachel Berns Part-time research assistant, Gait Behavior Laboratory Chapman University	Summer 2024 – Fall 2025
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Paloma Pallante Part-time research assistant, Gait Behavior Laboratory Chapman University	Summer 2024 – Present
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Samantha Jeffcoat Full-time research assistant, Gait Behavior Laboratory Chapman University	Spring 2023 – Sum. 2025
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Isabel Munoz-Orozco Undergraduate student in Kinesiology. California State University, Northridge Participant recruitment, data collection and processing Next position: PhD Student in Kinesiology at University of Michigan	Spring 2022
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DPT Students

Laura Corona, Jessica Cota, Emi Heisterkamp, Brandon Nakano, Rebecca Wingen, Joseph Yeung Doctorate in Physical Therapy at Chapman University PT 752 Scientific Inquiry Project	Sum. 2023 – Spr. 2024
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Lorcan Graham, Makenna Howard, Julia Malloy, Khloe McCarthy, Marissa Vasquez Doctorate in Physical Therapy at Chapman University PT 752 Scientific Inquiry Project	Spring 2023 – Fall 2023
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Carly Post Doctorate in Physical Therapy Student. Division of Biokinesiology and Physical Therapy. University of Southern California Data collection and clinical measures of walking recovery post-stroke Next position: Instructor of Physical Therapy University of Southern California	Spring 2022
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Natalia Sánchez, PhD.

Suzanne Adkins, Matthew Gordon, Cynthia Montejano 2013 – 2014
Doctorate of Physical Therapy Students at Northwestern University.
Effect of supine vs. standing posture in joint torque coupling patterns in the paretic lower extremity
Presented at CSM, 2014. Poster presentation

Undergraduate Students

Evan Shrier Spring 2024 – Present
Undergraduate Student in Applied Physiology, Gait Behavior Lab
Chapman University

Hailey Hashiguchi Spring 2024 – Present
Undergraduate Student in Applied Physiology, Gait Behavior Lab
Chapman University

Alejandro Aguirre-Ramirez Fall 2023 – Present
Undergraduate Student in Biology, Gait Behavior Lab
Chapman University
Awards: American Society of Biomechanics student travel award.

Adrian Aragon Sum. 2023 – Sum. 2024
Undergraduate Student in Applied Physiology, Gait Behavior Lab
Chapman University

Camille Grandjean 2019 – 2020
Undergraduate Student in Biomedical Engineering. University of Southern California

Noah Tristan 2019 – 2020
Undergraduate Student in Biomedical Engineering. University of Southern California

ACADEMIC MENTORING

Sungyool Park, Hahn Pham, Jordan Ramirez, Samuel Reardon, 2026 Summer Cohort
Richard Rise, Savannah Ryan, Alana Salva, Julia Sciesinski
Doctorate in Physical Therapy at Chapman University

Hannah Kapicki, Kyle Kawashiri, Annette Kim, Ashley Maayah, 2026 Fall Cohort
Maegan Mendoza, Scarlett Miller, Nathan Ng
Doctorate in Physical Therapy at Chapman University

Sarah Andershak, Delanie Barnes, Alexis Barriga, Kylie Chavez 2025 Fall Cohort

SCIENTIFIC REVIEW

GRANT REVIEW

University of Nebraska Internal Grants Reviewer April 2025

National Institutes of Health July 2024 – Present
Eunice Kennedy Shriver National Institute of Child Health and Human Development
5/1/2025

Natalia Sánchez, PhD.

Function, Integration, and Rehabilitation Sciences Study Section (Permanent Member)

National Institutes of Health

June 2023, Oct. 2023

Musculoskeletal Rehabilitation Sciences Study Section – MRS (Temporary Member)

EDITORIAL BOARD

Neurorehabilitation and Neural Repair

April 2025 – Present

Associate Editor

Neurorehabilitation and Neural Repair

Nov. 2023 – April 2025

Early Career Editor

Manuscripts Reviewed: 13

JOURNAL REVIEW

Year	Scientific Journal (number of reviewed papers)
2025	Science Translational Medicine (1) PLOS Computational Biology (1) Journal of Neurophysiology (1) Transactions in Neural Systems and Rehabilitation Engineering (1)
2024	Frontiers in Human Neuroscience (1) PLOS One (1) Journal of Experimental Biology (1) Journal of Neurophysiology (1) Transactions in Neural Systems and Rehabilitation Engineering (2)
2023	Frontiers in Neuroscience (1) Journal of Neurophysiology (1) Journal of Neurorehabilitation Engineering (1) Neurorehabilitation and Neural Repair (2) Journal of Biomechanics (1)
2022	Scientific Reports (1) Journal of Neurorehabilitation Engineering (1) Journal of Biomechanics (1) Journal of Neurophysiology (1) Frontiers in Neuroscience (1)
2021	Experimental Brain Research (1) Journal of Biomechanics (1) Journal of Experimental Biology (1) Journal of Neurophysiology (2) Neurorehabilitation and Neural Repair (1)
2020	Frontiers in Neurology (1) The Journal of Physiology (1) Royal Society Open Science (1) Journal of Neurorehabilitation Engineering (2)

5/1/2025

Natalia Sánchez, PhD.

Experimental Gerontology (1)
eLife (1)
Journal of Biomechanics (1)
Transactions in Neural Systems and Rehabilitation Engineering (1)
Journal of Neurophysiology (1)

2019 Transactions in Biomedical Engineering (1)
Neuroscience (1)
Frontiers in Neuroscience (1)
Journal of Neurorehabilitation Engineering (1)
Gait and Posture (1)
Transactions in Neural Systems and Rehabilitation Engineering (1)
Journal of Applied Biomechanics (1)

2018 Neurorehabilitation and Neural Repair (3)
Journal of Neurophysiology (1)
Journal of Neurorehabilitation Engineering (1)

2017 Gait and Posture (1)

2016 Journal of Applied Biomechanics (1)

CONFERENCE REVIEW

American Society of Neurorehabilitation Abstract Reviewer annual conference	2022 - Present
American Society of Biomechanics Abstract Reviewer annual conference	2023, 2024
Advances in Motor Learning and Motor Control Abstract Reviewer annual conference	2019, 2023
Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) Scholarship reviewer, Judge	2023
IEEE EMBS Abstract Reviewer annual conference	2014

SERVICE AND LEADERSHIP

Professional Service

American Society for Neurorehabilitation Annual Meeting Program Committee	Oct 2022 – Present
American Society for Neurorehabilitation Diversity, Equity and Inclusion Taskforce	June 2022 – Present

University Service

5/1/2025

Natalia Sánchez, PhD.

Chapman University

Department of Physical Therapy CAPTE Accreditation Committee	May 2024 – Present
Department of Physical Therapy DEI Taskforce	October 2023 – Present
DPT Policy/Procedures Committee	April 2023 – Present
Reviewer of applications Doctor of Physical Therapy program	November 2022 – Present
Faculty Search Doctor of Physical Therapy program	September 2022, 2023

University of Southern California

The Diversity, Anti-Racism, Inclusion, and Community Engagement Council	Sept 2020 – July 2022
Student Support Subcommittee Division of Biokinesiology and Physical Therapy, University of Southern California	
Leader International Students Affinity group Division of Biokinesiology and Physical Therapy, University of Southern California	June 2020 – July 2022
Member Research, Teaching, Practice and Clinical Practice promotion committee Division of Biokinesiology and Physical Therapy, University of Southern California	June 2020 – July 2022
Reviewer of applications Division of Biokinesiology and Physical Therapy Doctor of Physical Therapy program	May 2019 – July 2022
Herman Ostrow School of dentistry USC Poster Judge for the Herman Ostrow School of Dentistry Research Day	March 2016 – July 2022
Organizer USC National Biomechanics Day	April 2019
USC Viterbi School of Engineering Judge for the 22nd Grodins Research Symposium in the Department of Biomedical Engineering	July 2018
Mentor STEM Goes Red, American Heart Association Mentoring of female high school students in the greater LA area with interest in STEM careers	January 2018 – July 2020
Newsletter Contributor Association for Women in Science	Sept 2013 – Sept 2016
Science Club Mentor Mentoring in science of middle school kids for Chicago Public Schools and McCormick Boys & Girls Club.	Sept 2013 – May 2015
Northwestern University Brain Awareness Organization. Chicago Public Schools teacher training in neuroscience.	Apr 2013 – Aug 2015

SOCIETIES AND MEMBERSHIPS

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|------------------------------|----------------|
| • Society for Neuroscience | 2009 – Present |
| • American Heart Association | 2012 – Present |

Natalia Sánchez, PhD.

- Society for the Neural Control of Movement 2016 – Present
- American Society of Biomechanics 2017 – Present
- American Society for Neurorehabilitation 2018 – Present