

CLAIRE CAMPBELL

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EDUCATION

University of Southern California
Ph.D., Neuroscience Graduate Program

Expected 2024

University of California, Davis
B.S., Neurobiology, Physiology, and Behavior

June 2014

RESEARCH EXPERIENCE

PhD Neuroscience Candidate, University of Southern California

August 2019-Present

Herting Neuroimaging Lab, Department of Population and Public Health Sciences

Advisor: Megan Herting, Ph.D.

Research Projects Led:

- Researching interaction of genes involved in risk for depression with socioeconomic status on brain development and onset of depression (dissertation work) – using longitudinal multi-level linear regression ($n \approx 10,000$)
- Evaluating relationship between air pollution and longitudinal emotional behavior (2024, *Environmental Research*) – using zero-inflated negative binomial models
- Investigated amygdala structure across adolescence (2021, *Developmental Cognitive Neuroscience*), and in relationship to hormone levels and androgen receptor genotype (2022, *Psychoneuroendocrinology*) – utilized generalized additive mixed models

Achievements to-date:

- Awarded NIH grant proposal (NRSA Predoctoral Fellowship, F31 MH131347) for dissertation research (2023-2025)
- Awarded T32 Environmental Genomics Predoctoral Scholar appointment within Keck School of Medicine of USC (2020-2023)
- Published numerous abstracts, 6 co-authored papers, and 3 first author papers
- Invited to present talks at both USC DORI's 7th Annual Symposium on Diabetes and Obesity and the 12th Annual USC Graduate Research Symposium (Finalist, recognized for top presentation skills)
- Collaborated on statistics and discussion of paper utilizing diffusion tensor imaging data to analyze the neurite density of the amygdala and its subregions (2021, *Neuroimage*)
- Presented at conferences: Flux Society for Developmental Cognitive Neuroscience (2020), Organization for Human Brain Mapping (2021/2022)
- Inaugurated the Student Wellness Committee and the Neuroimaging Journal Club
- Invited by the Neuroscience Graduate Program (NGP) to be a student liaison at Society for the Advancement of Chicanos/Hispanic and Native Americans in Science (SACNAS) Conference (2022)
- Maintained 4.0 GPA

Research Coordinator, University of Southern California

April 2017-August 2019

Herting Neuroimaging Lab, Department of Population and Public Health Sciences

Advisor: Megan Herting, Ph.D.

Responsibilities:

- Led Dr. Herting's R03 project: began multi-level modeling (linear and generalized additive mixed models) examining developmental changes in the amygdala in adolescents utilizing structural MRI images; included integration of data ($n \approx 400$): brain imaging, hormone analytes, and androgen receptor genotype
- Project coordinator for the Air, Brain and Behavior pilot study looking at the effects of air pollution on brain development and obesity: recruited and screened participants; scheduled visits; implemented full study visit protocols (MRI data collection, administration of cognitive and IQ tests); maintained large database, both digital and hard copies; postprocessed MRI images; collected, cleaned, and geocoded residential histories

Achievements:

- Began writing first first-author manuscript detailing the analyses of amygdala composition during adolescence (eventually published during graduate school - 2021, *Developmental Cognitive Neuroscience*)
- Pilot study led to co-authored manuscript (2020, *Frontiers in Human Neuroscience*)
- Presented results at Society for Neuroscience Conference (2018) and Organization for Human Brain Mapping (2019)
- Co-authored systematic review investigating the uses of brain imaging techniques in studying the effects of air pollution exposure on brain development (2019, *Frontiers in Public Health*)

Junior Specialist, University of California, Davis

June 2014-June 2016

McAllister Lab, Center for Neuroscience

Advisor: Kimberley McAllister, Ph.D.

Responsibilities:

- Coordinated, created, and meticulously maintained neuronal cultures
- Lab management: training of incoming lab members (technicians, grad students and post docs) in *in vitro* lab techniques (immunocytochemistry, confocal imaging, sterile culture technique and general lab safety); maintained lab

Achievements:

- Led collaboration with bioengineering department to develop novel microfluidic devices to manipulate synapse dynamics
- Performed and troubleshooted experiments examining the effects of neuronal activity on the localization of NMDA receptors

Clinical Research Assistant, University of California, Davis
Fragile-X Team, MIND Institute UC Davis Medical Center

April 2013-June 2014

Advisor: Maria Diez-Juan, M.S.

Responsibilities:

- Assisted and led iPad interventions for children with Autism Spectrum Disorder (ASD) by working on improving social skills, language, and learning: oversaw clinical sessions; delivered session follow-up guidelines for parents; implemented and scored assessment tools (PAL, PDDBI, BASC, EVT)

Achievements:

- Co-designed a protocol for enhancing communication between parents and ASD children utilizing iPad games and specific behavioral techniques

Non-profit Coordinator, University of California, Davis
California Public Interest Research Group (CALPIRG)

April 2013-June 2014

Responsibilities:

- Managed 10 interns for engaging and discussing the public to help enact statewide legislation and register voters
- Participated in a statewide conference at University of California, Berkeley by discussing current issues
- Led UC Davis' chapter meetings and proposed canvassing ideas

Laboratory Undergraduate Researcher, University of California, Davis

April 2011-April 2014

Vogel Laboratory for Environmental and Molecular Toxicology, Center for Health and the Environment

Advisor: Christoph Vogel, Ph.D.

Responsibilities:

- Performed *in vitro* assays studying immunity response to environmental stimuli in human cell culture and mouse tissue

Achievements:

- Co-author on paper looking at the protective role of aryl hydrocarbon receptor repression in inflammation and tumor growth (2019, *Cancers*)

Undergraduate Researcher, University of California, Los Angeles

June 2010-Dec 2012

Center for Advanced Technology in Schools (CATS), The National Center for Research on Evaluation, Standards, and Student Testing (CREST)

Advisor: Greg Chung, Ph.D.

Responsibilities:

- Developed assessment items and corresponding rubrics to help team at CATS in CREST develop computer games to teach math concepts to adolescents; conducted software testing; collaborated with peers and presented findings.

Achievements:

- Conducted "think-aloud studies" requiring a protocol and detailed observations
- Supervised study at Culver City Middle School: created teaching materials and protocols; collected and analyzed data

FUNDING, AWARDS, and SCHOLARSHIPS

NRSA F31 Predoctoral Fellowship, National Institute of Mental Health (F31 MH131347)	2023-2025
Environmental Genomics T32 Training Grant, USC Keck School of Medicine	2020-2023
12th USC Graduate Research Symposium Finalist, recognition for top presentation skills	2020
Adolescent Brain Cognitive Development Workshop Travel Award	2019
Canton Lehman High School Alumni Association Scholarship	2011, 2013
Dean's List	2011

WORKSHOPS

Training Course in Advanced Statistical Methods in Neuroimaging and Genetics (R25NS117281)
AI4Health Workshop

April 2023
December 2022

Modeling Developmental Change in ABCD Study (R25MH125545)	June 2021 - July 2021
ABCD ReproNim Course, Reproducible Analyses of ABCD Data (R25DA051675)	Oct 2020 - March 2021
Society for Neuroscience, Epigenetics in Neurobiology Virtual Conference	April 2020
ABCD Workshop on Brain Development and Mental Health (R25MH120869)	Aug 2019
University of Southern California (USC) Biostatistics R Bootcamp	Aug 2018

SCIENCE EDUCATION and OUTREACH

Neuroscience Graduate Program (NGP) student liaison at Society for the Advancement of Chicanos/Hispanic and Native Americans in Science (SACNAS) Conference	October 2022
Founding Tutor	June 2010 - June 2014

INVITED TALKS

The 12th Annual USC Graduate Research Symposium - <i>Amygdala subnuclei associations with age, sex, testosterone, and androgen receptor sensitivity in adolescents.</i>	February 2020
Diabetes & Obesity Research Institute (DORI) at the University of Southern California - <i>Dietary Decision-Making and Brain Structure in Youth</i>	February 2020
USC Annual Neuroscience Graduate Program Symposium - <i>Modeling gene-by-environment interactions on behavior and brain development associated with depression</i>	March 2024
Cedars-Sinai Medical Center Department of Computational Biomedicine - <i>Modeling Methodologies for Complex Datasets: Integrating biological, behavioral, environmental, and genetic data</i>	March 2024

MENTORSHIP

Mentor for a student in each incoming Neuroscience Graduate Program (NGP) cohort	2020, 2021, 2022
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RELEVANT COURSEWORK

Courses:

Graduate – Advanced Overview of Neurosciences (I and II), Seminar in Neurobiology, Ethics and Accountability in Biomedical Research, Regression Analysis for Health Data, Social and Emotional Development in Children, and Machine Learning for the Health Sciences.

Undergraduate – Intro to Biomedical Engineering, Engineering Problem Solving, Human Brain and Diseases, Intro to Biology Series + Labs, General Chemistry Series + Labs, Calculus: Integral Calculus, Calculus: Partial Derivatives and Series, General Psychology, General Physics Series + Labs, Primate Evolution, Organic Chemistry Series, Applied Statistics for Biological Sciences, Genes and Gene Expression, Animal Behavior, Biomolecules and Metabolism, Systemic Physiology, Structure and Function of Biomolecules, Neurobiology of Addictive Drugs, Bioenergetics and Metabolism, Neurobiology, Cell Biology, Principles of Environmental Physiology, Developmental Neurobiology, and Writing in Science.

SKILLS

Hard Skills:

Extensive experience in R (e.g., ggplot2, dplyr, knitr) with moderate coding experience in Python (e.g., seaborn, pandas, numby) and Bash/zsh · MRI Collection and Processing for 3-Tesla and 7-Tesla · Cleaning and Geocoding Residential Histories · Modeling Genetic Associations with Structural Brain Measurements · Creating Polygenic Risk Scores · Data Visualization · Manuscript Writing · Scientific Presentations · Data Science · Statistical Modeling (e.g., logistic, linear, non-linear) · Assessment Design and Evaluation · High-Performance Computing · Familiarity with AWS Infrastructure

Soft Skills:

Organization Skills · Grant Writing · Presentation Skills · Project Planning and Management · Teamwork · Inter-departmental and Cross-Organization Collaboration · Communication · Problem Solving · Public Speaking · Leadership · Resiliency · Detailed

SERVICE

Ad Hoc Reviewer: *Psychoneuroendocrinology*, *Nature Communications*, *Biological Psychiatry*

COMMITTEES

Neuroscience Graduate Program Wellness Committee, Inaugural Member, 2020 / 2021
University of Southern California, Neuroimaging Journal Club, Inaugural Member, 2020 / 2021

AFFILIATIONS

Society of Biological Psychiatry Member – 2023, 2024
Flux Society for Developmental Cognitive Neuroscience Society Member - 2020
Organization for Human Brain Mapping Member - 2019

Society for Neuroscience Member - 2018, 2020

CONFERENCES ATTENDED

Society of Biological Psychiatry - 2023
 Flux Society for Developmental Cognitive Neuroscience - 2020
 Organization for Human Brain Mapping (OHBM) - 2019, 2021, 2022
 Society for Neuroscience (SfN) - 2018

PEER-REVIEWED PUBLICATIONS

First Author:

1. **Campbell, C. E.**, Cotter, D. L., Bottenhorn, K. L., Burnor, E., Ahmadi, H., Gauderman, W. J., Cardenas-Iniguez, C., Hackman, D., McConnell, R., Berhane, K., Schwartz, J., Chen, J.-C., & Herting, M. M. (2024). Air pollution and age-dependent changes in emotional behavior across early adolescence in the U.S. *Environmental Research*, 240, 117390. <https://doi.org/10.1016/j.envres.2023.117390>
2. **Campbell, C. E.**, Mezher, A. F., Tyszkka, J. M., Nagel, B. J., Eckel, S. P., & Herting, M. M. (2022). Associations between testosterone, estradiol, and androgen receptor genotype with amygdala subregions in adolescents. *Psychoneuroendocrinology*, 137, 105604. <https://doi.org/10.1016/j.psychneuen.2021.105604>
3. **Campbell, C. E.**, Mezher, A. F., Eckel, S. P., Tyszkka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2021). Restructuring of amygdala subregion apportionment across adolescence. *Developmental Cognitive Neuroscience*, 48, 100883. <https://doi.org/10.1016/j.dcn.2020.100883>

Co-Author:

4. Cotter, D. L., **Campbell, C. E.**, Sukumaran, K., McConnell, R., Berhane, K., Schwartz, J., Hackman, D. A., Ahmadi, H., Chen, J.-C., & Herting, M. M. (2023). Effects of ambient fine particulates, nitrogen dioxide, and ozone on maturation of functional brain networks across early adolescence. *Environment International*, 177, 108001. <https://doi.org/10.1016/j.envint.2023.108001>
5. Azad, A., Cabeen, R. P., Sepehrband, F., Kim, R., **Campbell, C. E.**, Lynch, K., Tyszkka, J. M., & Herting, M. M. (2021). Microstructural properties within the amygdala and affiliated white matter tracts across adolescence. *NeuroImage*, 243, 118489. <https://doi.org/10.1016/j.neuroimage.2021.118489>
6. Kim, M. S., Luo, S., Azad, A., **Campbell, C. E.**, Felix, K., Cabeen, R. P., Belcher, B. R., Kim, R., Serrano-Gonzalez, M., & Herting, M. M. (2020). Prefrontal Cortex and Amygdala Subregion Morphology Are Associated With Obesity and Dietary Self-control in Children and Adolescents. *Frontiers in Human Neuroscience*, 14. <https://doi.org/10.3389/fnhum.2020.563415>
7. Belcher, B. R., Zink, J., Azad, A., **Campbell, C. E.**, Chakravarti, S. P., & Herting, M. M. (2020). The roles of physical activity, exercise, and fitness in promoting resilience during adolescence: Effects on mental well-being and brain development. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*. <https://doi.org/10.1016/j.bpsc.2020.08.005>
8. Herting, M. M., Younan, D., **Campbell, C. E.**, & Chen, J.-C. (2019). Outdoor air pollution and brain structure and function from across childhood to young adulthood: A methodological review of brain MRI studies. *Frontiers in Public Health*, 7, 332. <https://doi.org/10.3389/fpubh.2019.00332>
9. Vogel, C. F., Ishihara, Y., **Campbell, C. E.**, Kado, S. Y., Nguyen-Chi, A., Sweeney, C., Pollet, M., Haarmann-Stemmann, T., & Tuscano, J. M. (2019). A protective role of aryl hydrocarbon receptor repressor in inflammation and tumor growth. *Cancers*, 11(5), 589. <https://doi.org/10.3390/cancers11050589>

ABSTRACTS and POSTER PRESENTATIONS

First Author:

1. **Campbell, C. E.**, Bottenhorn, K., Cardenas-Iniguez, C., & Herting, M. M. (2022, June). *Effect of income-to-needs and baseline functional connectivity on brain network changes in childhood*. Organization for Human Brain Mapping, Glasgow, Scotland.
2. **Campbell, C. E.**, Pickering, T. A., Burnor, E. A., & Herting, M. M. (2021, June). *Modifying effects of sociodemographics on prefrontal cortex and lifetime depression in 9-10 year-olds*. Organization for Human Brain Mapping (OHBM).
3. **Campbell, C. E.**, Mezher, A. F., Eckel, S. P., Tyszkka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2020, September). *Androgen receptor genotype is associated with amygdala composition in adolescent females, but not males*. Flux Society for Developmental Cognitive Neuroscience Virtual Congress.
4. **Campbell, C. E.**, Mezher, A. F., Eckel, S. P., Tyszkka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2020, February). *Amygdala subnuclei associations with age, sex, testosterone, and androgen receptor sensitivity in adolescents*. The 12th Annual USC Graduate Research Symposium (Invited talk), Los Angeles, CA.

5. **Campbell, C. E.**, Azad, A., Kim, M. S., Kim, R., & Herting, M. M. (2020). *Dietary Decision-Making and Brain Structure in Youth*. Diabetes & Obesity Research Institute (DORI) at the University of Southern California (Invited talk), Los Angeles, CA.
6. **Campbell, C. E.**, Mezher, A. F., Tyszka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2019, October). *Associations between androgen receptor activity, testosterone and estradiol with male amygdala subnuclei during adolescence*. Southern California Biomedical Sciences Graduate Student Symposium, Los Angeles, CA.
7. **Campbell, C. E.**, Mezher, A. F., Tyszka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2019, June). *Associations between testosterone, estradiol and androgen receptor activity with the amygdala and its subregions in male adolescents*. Organization for Human Brain Mapping (OHBM), Rome, Italy.
8. **Campbell, C. E.**, Mezher, A. F., Tyszka, J. M., Pauli, W. M., Nagel, B. J., & Herting, M. M. (2018, November). *Amygdala nuclei composition across adolescence using a high-resolution probabilistic atlas*. Society for Neuroscience (SfN), San Diego, CA.

Co-Author:

9. Cotter, D., **Campbell, C. E.**, Sukumaran, K., McConnell, R., Berhane, K., Schwartz, J., Hackman, D., Ahmadi, H., Chen, J.-C., & Herting, M. (2022, September 18). Ambient air pollution and functional brain network development in adolescence. *ISEE Conference Abstracts*. <https://doi.org/10.1289/isee.2022.O-SY-040>
10. O'Sharkey, K., **Campbell, C. E.**, Felix, K., Schwartz, J., Lurmann, F., Pavlovic, N., McConnell, R., Habre, R., & Herting, M. (2022, September 18). Lifetime Residential Air Pollution Exposure, Amygdala Volumes, and Emotional Function in Young Adults. *ISEE Conference Abstracts*. <https://doi.org/10.1289/isee.2022.O-OP-050>
11. Buri, I., **Campbell, C. E.**, Barkhordarzadeh, D., Burnor, E. A., Younan, D., Cotter, D., & Herting, M. M. (2021). *Ambient Outdoor Air Pollution and Mental Health Outcomes: A Systematic Review*. 23rd Annual Undergraduate Symposium for Scholarly and Creative Work at University of Southern California, Los Angeles, CA.
12. Herting, M. M., **Campbell, C. E.**, Tyszka, J. M., & Nagel, B. J. (2021, April). *Amygdala subregion volumes in adolescents: The role of testosterone and androgen receptor genotype*. Society for Research in Child Development Virtual Meeting.
13. Jaime, M., Prathap, S. P., **Campbell, C. E.**, Jann, K., McConnell, R., Lurmann, F., Rappaport, E., Gilliland, F., & Herting, M. M. (2019). *Determining how PM2.5 exposure affects cerebral blood flow within young adults in Southern California (Honorable Mention Award)*. 21st Annual Undergraduate Symposium for Scholarly and Creative Work.
14. Herting, M. M., Kim, R., **Campbell, C. E.**, Gabor-Fourcade, E., Koppin, C. M., McConnell, R., & Kim, M. S. (2018, November). *Young adults, but not children, process food healthiness during dietary decision-making*. ObesityWeek, Nashville, TN.
15. Herting, M. M., **Campbell, C. E.**, Chu, X., Li, M., Cabeen, R. P., McConnell, R., Gilliland, F., Habre, R., Rappaport, E., & Lurmann, F. (2018, July). *PM2.5 exposure and brain and behavior in young adults from the Children's Health Study*. National Institute of Environmental Health Sciences (NIEHS) Core Centers Annual Meeting, Davis, CA.
16. King, L., **Campbell, C. E.**, Chu, X., McConnell, R., Habre, R., Rappaport, E., Gilliland, F., & Herting, M. M. (2018, April). *How does PM2.5 influence cognitive and emotional functioning in young adults?* University of Southern California Undergraduate Symposium, Los Angeles, CA.