

Sofia C. Carrera

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Professional appointments

Postdoctoral Fellow, Department of Anthropology, Northwestern University
Supervisors: Dr. Christopher Kuzawa & Dr. Thomas McDade March 2023-

Education

PhD in Biopsychology, University of Michigan – Ann Arbor 2023
Advisor: Dr. Jacinta Beehner
MS in Biopsychology, University of Michigan – Ann Arbor 2018
BS in Ecology and Evolutionary Biology, Yale University 2015
Advisor: Dr. Richard Bribiescas

Fellowships, grants, and awards

Doctoral Dissertation Research Improvement Grant (DDRIG), Biological Anthropology National Science Foundation (\$23,646) 2020-2023
L. S. B., Leakey Foundation Research Grant (\$14,910) 2019-2021
Graduate Research Fellowship Program (GRFP), National Science Foundation 2016-2021
Best Poster Award, Midwest Primate Interest Group 2021
Leonard Small Award, Rackham International Research Award University of Michigan (\$7,200) 2019
Pillsbury Graduate Research Award, Department of Psychology University of Michigan (\$1,000) 2019
Diversity Travel Award, Animal Behavior Society 2019
African Studies Center Research Grant, University of Michigan (\$2,000) 2018
Rackham Professional Development Grant, University of Michigan (\$400) 2018
Rackham Graduate Student Research Grant, University of Michigan (\$1,500) 2017
International Research Experience for Students (IRES), National Science Foundation 2014
Thomas C. Barry Travel Fellowship, Yale University 2013

Peer-reviewed publications

* undergraduate mentees

† manuscript available upon request

Sen S, **Carrera SC**, Heistermann M, Potter CB, Baniel A, DeLacey PM, Petruccio L, Lu A, & JC Beehner. (2022). Social correlates of androgen levels and dispersal age in juvenile male geladas. *Hormones and Behavior* 146. <https://doi.org/10.1016/j.yhbeh.2022.105264>

Beehner JC, Alfaro J, Allen C*, Benítez ME, Bergman TJ, Buehler MS, **Carrera SC**, Chester EM, Deschner T, Fuentes A, Gault CM, Godoy I, Jack KM, Kim JD*, Kolinski L, Kulick NK, Losch T, Ordoñez JC, Perry SE, Pinto F, Reilly OT, Johnson ET, Wasserman MD. (2022). Using an onsite laboratory for fecal steroid analysis in wild white-faced capuchins. *General and Comparative Endocrinology* 329. <https://doi.org/10.1016/j.ygcen.2022.114109>

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Carrera SC, Sen S, Heistermann M, Lu A, & Beehner, JC. (2020). Low rank and primiparity increase fecal glucocorticoid metabolites across gestation in wild geladas. *General and Comparative Endocrinology* 293. <https://doi.org/10.1016/j.ygcen.2020.113494>

Lu A, Petrullo L, **Carrera SC**, Feder J, Schneider-Crease I, & Snyder-Mackler N. (2019). Developmental responses to early life adversity: Evolutionary and mechanistic perspectives. *Evolutionary Anthropology* 28(5): 249-266. <https://doi.org/10.1002/evan.21791>

Carrera SC, Carba DB, Gettler L, Lee NR, Kuzawa C. Adverse childhood experiences (ACEs) predict behaviors associated with a faster life history. *In prep*[†]

Carrera SC, Godoy I, Gault CM, Mensing A, Damm J, Perry SE, & JC Beehner. Stress responsiveness predicts survival across an El Niño drought in a wild primate. *In prep*[†]

Carrera SC, Baniel A, Mansi Z*, Gannamaneni J*, Snyder-Mackler N, Bergman TJ, Beehner JC, and A Lu. Low rank, primiparity, and male infants slow female reproductive pace in geladas. *In prep*

Research Experience

Young Lives Study, Department of International Development, University of Oxford 2022-2023

- Consulted on the development of a new survey component to measure physiological biomarkers of stress in a longitudinal cohort study
- Trained the field supervisors to collect and preserve hair samples for analysis
- Assisted in obtaining funding for sample collection and analysis

Beehner Endocrine Laboratory, University of Michigan 2016-2022

- Led the lab transition from radioimmunoassays to enzyme immunoassays for the measurement of hormone metabolites in various sample media
- Trained other researchers in conducting assays and in preparing reagents in-house

Simien Mountain Gelada Research Project (SMGRP), Ethiopia 2017-2021

- Designed a new ethogram (for use with the Animal Observer application) to collect data on mother-infant interactions
- Performed 12 months of fieldwork in the remote Simien Mountains to collect demographic, behavioral, and hormonal data on wild geladas
- Coordinated the continuation of data collection and processing when no field managers or graduate students could be in the field due to Covid-19 and ethnic conflict

Owl Monkey Project, USA and Argentina 2015-2016

- Assisted in the collection of behavioral data and hormonal samples from a population of captive owl monkeys (MD Anderson Research Center, TX)
- Conducted 6 months of field research on a population of wild owl monkeys (Argentina) to collect demographic, behavioral, and hormonal data

Reproductive Ecology Laboratory, Yale University 2013-2015

- Processed fecal samples from the Owl Monkey Project for hormonal analysis
- Measured testosterone metabolites in these samples via enzyme immunoassays to assess the diurnal pattern in this partially nocturnal species

Veterinary Wildlife Services, Kruger National Park, South Africa 2014

- Helped validate an enzyme immunoassay to measure cortisol in wild buffalo fecal samples and assess disease status

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- Organization for Tropical Studies, Kruger National Park, South Africa 2014
- Performed capture-and-release of small mammal populations to examine how the growing elephant population impacted species abundance and diversity
 - Selected for the NSF International Research Experience for Students (IRES) program
- Asociación Fauna Forever, Peru 2013
- Collected behavioral and home-range data on eight primate species living in a remote area of the Peruvian Amazon to inform conservation efforts in the region
 - Assisted in the training of new research volunteers and led teams into the rainforest

Published Abstracts

- Carrera SC**, Baniel A, Feder J, Snyder-Mackler N, Bergman T, Beehner JC, & A Lu. (2022). Female geladas accelerate weaning in larger groups – possibly to reduce infanticide risk. 91st Annual Meeting of the American Association of Biological Anthropologists, Denver, CO.
- Carrera SC** & AW Kim. (2022). Higher gravidity predicts lower hypertension risk in rural South Africa. 47th Annual Meeting of the Human Biology Association, Denver, CO.
- Mansi Z*, **Carrera SC**, & JC Beehner. (2022). Lactating geladas increase glucocorticoids in response to male takeovers. COD Undergraduate Research Symposium at the 91st Annual Meeting of the American Association of Biological Anthropologists, Denver, CO.
- Carrera SC**, Baniel A, Feder J, Beehner JC, & A Lu. (2021). Larger group size is associated with faster weaning in wild geladas. Annual meeting of the Midwest Primate Interest Group, Chicago, IL.
- Carrera SC**, Beehner JC, Gault CM, Godoy I, & SE Perry. (2021). Wild capuchins with higher glucocorticoid reactivity were more likely to survive a severe El Niño event. Annual meeting of the International Society for Evolution, Medicine, and Public Health, Virtual.
- Carrera SC**, Lu A, & JC Beehner. (2019). In a non-seasonal primate, off-peak births require more time foraging during pregnancy. 56th Annual Conference of the Animal Behavior Society, Chicago, IL.
- Carrera SC**, Lu A, & JC Beehner. (2018). Variation in time to weaning in wild geladas. 87th Annual Meeting of the American Association of Physical Anthropologists, Austin, TX.
- Carrera SC**, Corley MK, Bribiescas RG, Valeggia C, & E Fernandez-Duque. (2016). Investigating how collection time affects fecal testosterone in a cathemeral species: *Aotus azarae*. Joint meeting of the International Primatological Society and the American Society of Primatologists, Symposium on Owl Monkeys, Chicago, IL.

Invited talks and Guest Lectures

- Evolution, Ecology, and Behavior Colloquium, University of Illinois Urbana-Champaign 2023
“Wild capuchins with a stronger HPA axis response were more likely to survive a catastrophic El Niño event”
- Behavioral Endocrinology Seminar, Loyola Marymount University 2020
Instructor: Dr. Kristen Covino
“Glucocorticoids as a measure of early-life adversity”
- Psych 337 – Hormones and Behavior, University of Michigan 2020
Instructor: Dr. Jennifer Cummings
“Sex-biased investment: sons vs. daughters”

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Teaching Experience

- PSYCH 402 – Biology of Maternal Effects, University of Michigan 2022
Lead Instructor: Sofia Carrera
- Designed and taught a capstone seminar for upper-level undergraduates in the Biopsychology, Cognition, and Neuroscience major at UM. We discussed primary literature from diverse disciplines to develop an understanding of how mothers may impact their offspring via behavior, hormones, epigenetics, and more. To conclude, we turned to the biomedical and public health literatures to learn how maternal effects relate to health inequities.
- PSYCH 230 – Introduction to Behavioral Neuroscience, University of Michigan 2018
Lead Instructor: Dr. Kent Berridge
- Graduate Student Instructor: Led discussion sections and review sessions.
- ANTHRBIO 463 – Statistical Modeling and Data Visualization in R, University of Michigan 2017
Lead Instructor: Dr. Andrew Marshall
- Graduate Student Instructor: Designed and led lab sections for this new course. Held weekly problem-solving sessions. Graded weekly and final problem sets.

Mentoring

- Undergraduate Research Opportunity Program (UROP), University of Michigan 2017-2022
- Mentored freshmen and sophomores working in the Beehner Endocrinology Lab. Guided them through the design of research projects, taught them laboratory skills, and helped them prepare poster presentations for the UROP Research Symposium.
 - Out of 6 UROP students (5 from under-represented minority groups) over the years, 4 continued to work with me in the lab through their graduation. I continued to mentor them throughout this time, teaching advanced laboratory and statistical techniques in addition to manuscript preparation.
 - One of these students worked with me for her honors thesis research. She presented her work at the COD Undergraduate Research Symposium at the 2022 American Association of Biological Anthropologists conference. She is now in medical school.
- Association for Women in Science, University of Michigan 2017-2020
- Led small groups of undergraduates, graduate students, and postdocs in discussions about being a woman in STEM.

Certificates

- Diversity, Equity, and Inclusion Certificate 2022
Rackham Graduate School, University of Michigan
- Evolutionary Medicine Summer Institute 2021
Triangle Center for Evolutionary Medicine (TriCEM)
- Data wrangling, analysis and AB testing with SQL 2020
Coursera, University of California – Davis
- SQL for data science 2020
Coursera, University of California – Davis
- STEM communication fundamentals 2019
Researchers Expanding Lay-Audience Teaching and Engagement (RELATE)
- Social Determinants of Population Health 2019

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Summer Session in Epidemiology, University of Michigan School of Public Health	
Science Communication Fellowship	2019
Portal to the Public, University of Michigan Museum of Natural History	
ComSciCon	2018
Michigan State University	

Science Communication and Engagement

K-12 audiences

- Scientist Spotlights, UM Museum of Natural History
- Females Excelling More in Math, Engineering, and the Sciences (FEMMES)
- Simien Lodge Annual Conservation Classes, Ethiopia

Lay audiences

- Talks for tourists of the Simien Mountains, Ethiopia
- The ‘Arch and Anth Podcast’ (ep. 144)
- Nerd Nite Talks, Ann Arbor District Library
- The ‘But Why?’ podcast, Vermont Public Radio

Policy makers, tour guides, park officials

- Research talks about the latest gelada research and conservation efforts, Debark, Ethiopia
- Conservation talk, Kruger National Park, South Africa

Service

Peer reviewer – *Conservation Physiology, General and Comparative Endocrinology, Mammalian Biology*

Biopsychology area DEI taskforce – Student member

Biopsychology Graduate Admissions Committee – Student member

Biopsychology area 10-year review – Student committee member

Skills

R | R Markdown | SQL | Git | Adobe Photoshop

Radioimmunoassay | Enzyme immunoassay validation

English (native) | Spanish (fluent) | Amharic (beginner)