

TRACY M. MONTGOMERY

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I am a behavioral ecologist interested in how group-living animals cope with individual, social, and ecological demands in fluctuating environments. I am a lead researcher at two long-term field sites: the Mara Hyena Project in Kenya (where I study social carnivores, spotted hyenas) and the Sifaka Research Project in Madagascar (where I study social lemurs, Verreaux's sifaka). In my research, I combine observational, remote sensing, and laboratory approaches to understand how individual physiological and behavioral processes produce group- and community-level social dynamics in wild populations.

EDUCATION

- 2013 – 2020 Dual PhD, Michigan State University, East Lansing MI
Zoology and Ecology, Evolution, and Behavior (EEB)
Dissertation: Physiological mediation of social behavior in group-living carnivores
Advisor: Dr. Kay E. Holekamp
- 2006 – 2010 B.A. Biology (*cum laude*) and French, Amherst College, Amherst MA

RESEARCH and ACADEMIC POSITIONS

- 2025 – pres. Michigan State University, East Lansing MI
Assistant Professor, Department of Integrative Biology
- 2025 – pres. Max Planck Institute of Animal Behavior, Konstanz, Germany
Affiliated Scientist, Department for the Ecology of Animal Societies
- 2021 – 2025 Universität Konstanz, Konstanz, Germany
Research affiliate, Centre for the Advanced Study of Collective Behaviour
- 2020 – 2025 Max Planck Institute of Animal Behavior, Konstanz, Germany
Postdoctoral researcher. Supervisors: Dr. Meg Crofoot & Dr. Rebecca Lewis
- 2015 – 2016 University of Michigan, Core Assay Facility, Ann Arbor MI
Lab-based endocrine research for PhD. Supervisor: Dr. Jacinta Beehner
- 2014 – 2015 Michigan State University, Mara Hyena Project, Maasai Mara, Kenya
Field-based observational research for PhD. Supervisor: Dr. Kay Holekamp
- 2013 – 2020 Michigan State University, East Lansing MI
PhD student
- 2013 Université de Lausanne, Inkawu Vervet Project, KwaZulu-Natal, South Africa
Field assistant. Supervisors: Dr. Erica van de Waal & Dr. Erik Willems
- 2011 – 2012 New England Aquarium, Right Whale Research Project, Boston MA & Lubec ME
Research assistant. Supervisors: Dr. Scott Kraus & Dr. Moira Brown
- 2010 – 2011 Michigan State University, Mara Hyena Project, Maasai Mara, Kenya
Research assistant and camp manager. Supervisor: Dr. Kay Holekamp
- 2009 – 2010 Amherst College, Clotfelter Research Lab, Amherst MA
Honors research thesis. Supervisor: Dr. Ethan Clotfelter

GRANTS, FELLOWSHIPS, and AWARDS

Research grants

- 2021 Research Grant from Cluster of Excellence at Universität Konstanz (€138,109)
"Social transmission of predation risk across wild groups of Verreaux's sifaka"
- 2021 DEI Grant from Cluster of Excellence at Universität Konstanz (€3,800)
"Supporting safe, inclusive, and diverse field biology"
- 2019 Society for Integrative and Comparative Biology Grant-in-Aid of Research (\$900)
- 2018 American Society of Mammalogists Grant-in-Aid of Research (\$1,500)
- 2017 Research Grant from the endowment for Dr. Marvin Hensley (\$8,900)
- 2015 – 2018 Research Grants from the endowment for John R. Shaver (2 grants, total \$2,150)

Fellowships

- 2019 – 2020 P.E.O. Scholar Award (\$15,000)
- 2018 – 2020 Michigan State University College of Natural Science fellowships
(3 awards, total \$19,500)
- 2014 – 2020 Michigan State University EEB fellowships (5 awards, total \$9,600)
- 2013 – 2018 National Science Foundation Graduate Research Fellowship (\$138,000)
- 2013 Michigan State University BEACON Top-Up Fellowship (\$5,000, declined)
- 2013 – 2019 Michigan State University Distinguished Fellowship (\$80,000)

Travel awards

- 2018 International Society for Behavioral Ecology Travel Award (\$500)
- 2017 Animal Behavior Society Graduate Student Travel Award (\$500)
- 2017 Michigan State University Zoology travel grant (\$300)
- 2015 – 2017 Michigan State University EEB travel grants (2 grants, total \$2,990)

Other awards

- 2020 EEB Distinguished Student Speaker (\$500)

PUBLICATIONS (* = mentored co-author)

In review

Slania NA, ... **Montgomery TM**, ... et al. Proto-gossip: investigating precursors to human gossip in nonhuman animals. *Biological Reviews*.

Peer-reviewed journal publications

- 2023 **Montgomery TM**†, Lehmann KDS†, Gregg S*, Keyser K*, McTigue LE*, Beehner JC, Holekamp KE. Determinants of hyena participation in risky collective action. *Proceedings of the Royal Society B* 290: 20231390. doi: 10.1098/rspb.2023.1390
† = These two authors contributed equally to this work.
Featured in [Nature News & Views](#), [PNAS Front Matter](#), and [Wissenschaft.de](#).
- 2022 McCormick SK*, Laubach ZM, Strauss ED, **Montgomery TM**, Holekamp KE. Evaluating drivers of female dominance in the spotted hyena. *Frontiers in Ecology and Evolution* 10: 934659. doi: 10.3389/fevo.2022.934659

- 2022 Laubach ZM, Gering E, Yang E, **Montgomery TM**, Getty T, Holekamp KE. Associations between *Toxoplasma gondii* infection and steroid hormone levels in spotted hyenas. *International Journal for Parasitology: Parasites and Wildlife* 17: 53-59. doi: 10.1016/j.ijppaw.2021.11.007
- 2022 Greenberg JR, **Montgomery TM**, Holekamp KE, Beehner JC. Validation and effects of drying and prey hair on fecal hormone concentrations in spotted hyenas. *Journal of Mammalogy* 103: 394-406. doi:10.1093/jmammal/gyab168
- 2022 **Montgomery TM**, Greenberg JR, Gunson JL*, John K*, Laubach ZM, Nonnamaker E*, Person ES*, Rogers H*, Ronis EM*, Smale L, Steinfield KR*, Strong R*, Holekamp KE, Beehner JC. Measuring salivary cortisol in wild carnivores. *Hormones and Behavior* 137: 105082. doi: 10.1016/j.yhbeh.2021.105082
- 2021 Laubach ZM, Greenberg JR, Turner JW, **Montgomery TM**, Pioon MO, Sawdy MA, Smale L, Cavalcante RG, Padmanabhan KR, Lalancette C, vonHoldt B, Faulk CD, Dolinoy DC, Holekamp KE, Perng W. Early-life social experience affects offspring DNA methylation and later life stress phenotype. *Nature Communications* 12: 4398. doi: 10.1038/s41467-021-24583-x
- 2021 Gering E, Laubach ZM, Weber PSD, Hussey GS, Lehmann KDS, **Montgomery TM**, Turner JW, Perng W, Pioon MO, Holekamp KE, Getty T. *Toxoplasma gondii* infections are associated with costly boldness toward felids in a wild host. *Nature Communications* 12: 3842. doi: 10.1038/s41467-021-24092-x
- 2018 **Montgomery TM**, Pendleton EL*, Smith JE. Physiological mechanisms mediating patterns of reproductive suppression and alloparental care in cooperatively breeding carnivores. *Physiology and Behavior* 193: 167-178. doi: 10.1016/j.physbeh.2017.11.006
- 2017 Smith JE, Lehmann KDS, **Montgomery TM**, Strauss ED, Holekamp KE. Insights from long-term field studies of mammalian carnivores. *Journal of Mammalogy* 98: 631-641. doi: 10.1093/jmammal/gyw194
- 2017 Lehmann KDS†, **Montgomery TM**†, MacLachlan SM*, Parker JM*, Spagnuolo OS*, VandeWetering KJ*, Bills PS, Holekamp KE. Lions, hyenas and mobs (oh my!). *Current Zoology* 63: 313-322. doi: 10.1093/cz/zow07
† = These two authors contributed equally to this work.
- 2014 **Montgomery TM**, Brown AC, Gendelman HK*, Ota M*, Clotfelter ED. Exposure to 17 α -ethinylestradiol decreases motility and ATP in sperm of male fighting fish *Betta splendens*. *Environmental Toxicology* 29: 243-252. doi: 10.1002/tox.21752
- 2011 Stevenson LM, Brown AC, **Montgomery TM**, Clotfelter ED. Reproductive consequences of exposure to waterborne phytoestrogens in male fighting fish *Betta splendens*. *Archives of Environmental Contamination and Toxicology* 60: 501-510. doi: 10.1007/s00244-010-9561-y

Book chapters and other publications

- 2020 Gering E, Laubach Z, Weber P, Hussey G, Turner J, Lehmann K, **Montgomery T**, Holekamp K, Getty T. 2020. Time makes you older, parasites make you bolder - *Toxoplasma gondii* infections predict hyena boldness toward definitive lion hosts. *Evolution in Action: Past, Present and Future*. Springer Nature Switzerland. doi: 10.1007/978-3-030-39831-6_16.
- 2017 **Montgomery TM**, Holekamp KE. Dominance, testosterone, and cortisol. *Encyclopedia of Evolutionary Psychological Science*. Springer International Publishing. doi: 10.1007/978-3-319-16999-6_1439-1.

RESEARCH PRESENTATIONS

Invited talks

- 2023 Full-Stack Bioacoustics Workshop. Deploying a localization array of passive acoustic monitors in a seasonal Madagascar forest. Konstanz, Germany.
- 2023 Centre for the Advanced Study of Collective Behaviour Seminar Series. Social information transmission in the wild: How do prey collectively monitor and respond to predation risk? Konstanz, Germany & Online. Available [online](#).
- 2021 Max Planck Institute of Animal Behavior Seminar Series. Integrating resources, predation risk, and neighboring groups to understand movement choices. Konstanz, Germany.
- 2020 Long Term Animal Research Seminar Series. Long-term studies of spotted hyenas in Kenya. Online. Available [online](#).
- 2020 Michigan State University EEB Distinguished Student Speaker. Collective action in complex societies. East Lansing MI.
- 2016 University of Michigan Integrative Behavioral Ecology Discussion Group. Social endocrinology of competition and cooperation in spotted hyenas. Ann Arbor MI.

Conference presentations

- 2020 Holekamp KE, **Montgomery TM**, Strauss ED. Social competition and cooperation affect reproductive success of female spotted hyenas. Society for Integrative and Comparative Biology, Austin TX. Invited oral presentation.
- 2019 **Montgomery TM**, Lehmann KDS, Holekamp KE. Individual participation in cooperative mobbing behavior in spotted hyenas. Animal Behavior Society Conference, Chicago IL.
- 2018 **Montgomery TM**, Lehmann KDS, Holekamp KE. Individual participation in cooperative mobbing behavior. International Society of Behavioral Ecology Conference, Minneapolis MN.
- 2018 **Montgomery TM**, Beehner JC, Holekamp KE. Immediate benefits of social play behavior. Indiana University CISAB Animal Behavior Conference, Bloomington IN.
- 2017 **Montgomery TM**, Beehner JC, Holekamp KE. Adaptive function of social play behavior. Animal Behavior Society Conference, Toronto, Canada.
- 2015 Lehmann KDS, **Montgomery TM**, Holekamp KE. Cooperation and communication in spotted hyenas. Behaviour Conference, Cairns, Australia. Invited oral presentation.
- 2011 Clotfelter ED, Brown AC, **Montgomery TM**, Stevenson LM, Gendelman HK, Ota M. Reproductive consequences of exposure to waterborne phytoestrogens and ethinyl estradiol in male fighting fish *Betta splendens*. Society of Integrative and Comparative Biology Annual Meeting, Salt Lake City UT.

TEACHING and MENTORING

Primary instructor

- 2018 Behavioral Ecology of African Mammals (IBIO490), Kenya. Lead instructor. Redesigned and updated course, including syllabus, lectures, and assignments.
- 2017 Behavioral Ecology of African Mammals (IBIO490), Kenya. Instructor.

Graduate student instructor (TA)

- 2018 (spring) Ecology Lab (IBIO355L), Michigan State University. Lab instructor.

- 2017 (fall) Ecological Aspects of Animal Behavior (IBIO415), Michigan State University. Discussion instructor.
- 2017 (spring) Environmental Physiology (IBIO483), Michigan State University. Discussion instructor.

Invited guest lecturer

- 2018 – 2019 Ecological Aspects of Animal Behavior (IBIO415), Michigan State University.
- 2015 Behavioral Ecology of African Mammals (IBIO490), Kenya.

Undergraduate instructor (TA)

- 2010 (spring) Adaptation and the Organism (BIOL181), Amherst College. Teaching assistant.
- 2008 (spring) Chemical Principles (CHEM161), Amherst College. Teaching assistant.

Thesis supervision

- 2024 – 2025 Dario Walser. MSc thesis, Universität Konstanz. Leadership in Verreaux's sifaka.
- 2022 – 2023 Ann-Kathrin Pohle. MSc thesis, Universität Konstanz. Evaluating delayed benefits of juvenile social play in spotted hyenas.

Mentoring and advising (* = pursued independent research projects with me)

- 2022 – 2025 Graduate research assistants from Université d'Antananarivo, Madagascar (Harinjara Rafaliarintsoa*, Jean-Claude Razafimampandra, Haja Fabrice Razafindrabe*)
- 2022 – 2023 Max Planck ARTEMIS: African Research Talents Experiencing Mentoring in Science (Pierrot Ramanamandimby*). Organized international visit and taught Intro to R workshop for a group of African PhD students as part of this program.
- 2021 – 2025 Undergraduate and post-baccalaureate research assistants from Universität Konstanz (Axel Bauer, Miriam Dietrich, Zeynep Durmus, Marleen Franz, Alexia Freude, Selina Grosse, Luis Lohlein, Ann-Kathrin Pohle*, Svenja Sausen, Kevin Schuster, Yulai Xia, Maximiliane Ziefle)
- 2021 Animal Behaviour Collective (Nathalia Bustamante, Anuska Mohapatra)
- 2014 – 2020 14 mentee-led conference posters presented at American Society of Mammalogists Annual Meeting, Animal Behavior Society Conference, Mid-Michigan Symposium for Undergraduate Research Experiences, and University Undergraduate Research and Arts Forum. Two posters by different mentees won a First Place Award (each \$100).
- 2014 – 2020 Undergraduate research assistants from Michigan State University (Kylie Ayers, Ally Brown, Hanna Burton, Ashley Dunn*, Rachel Gaines, Kara Hartunian, Jenna Parker, Sara Saikalis, Olivia Spagnuolo, Kelsey VandeWetering)
- 2019 SROP: Summer Research Opportunities Program (Jessica Calvario*)
- 2018 – 2019 MI-LSAMP: Michigan Louis Stokes Alliance for Minority Participation Program (Candice Rivers*)
- 2016 – 2019 Professorial Assistantship Program (Julie Javorka*, Abby Shaw, Eliza Turnage)
- 2014 – 2016 Beckman Scholars Program (Sarah MacLachlan*)
- 2014 – 2015 NSF IRES: International Research Experience for Students Program (Matt Farr, Spencer Freeman, Molly McEntee, Chase O'Neil, Heidi Rogers, Ashlei Tinsley)

Professional development (only full-day or longer experiences included)

- 2024 Sign up! Career Building Program. Full-year professional development program for female postdocs pursuing an academic career.
- 2022 Laboratory Animal Science Course on Non-Human Primates. Five-day FELASA certification course about ethics and welfare in primate research.
- 2021 Advanced Wilderness First Aid Course. Four-day course by Outdoor Schule Süd.
- 2019 (spring) Teaching College Science (ISE870). Semester-long class.
- 2019 Graduate School Leadership Academy. 8-week professional development workshop series. Created mentoring expectations and assessment resource [guide](#).
- 2019 Natural Science Cultural Competency Training. Full-day workshop.
- 2018 Graduate School Leadership Summit. Full-day workshop.
- 2016 (fall) Professional Development (IBIO801). Semester-long class.

SERVICE and OUTREACH

Academic service

- 2018 – pres. Reviewer for *American Journal of Primatology*, *Animals*, *Behavioral Ecology and Sociobiology*, *Biology Letters*, *Conservation Science and Practice*, *Conservation Physiology*, *Environmental Monitoring and Assessment*, *Hormones and Behavior*, *Integrative and Comparative Biology*, *Journal of Mammalogy*, *Theriogenology* *Wild*.
- 2024 – 2025 Member of Field DEI Working Group, Max Planck Institute of Animal Behavior.
- 2023 – 2024 Organizer for Gesellschaft für Primatologie Conference, Universität Konstanz.
- 2023 – 2024 Institute Seminar Organization Committee, Max Planck Institute of Animal Behavior.
- 2022 – 2024 Bücklestraße Social Hour Coordinator, Max Planck Institute of Animal Behavior.
- 2021 – 2022 Diversity Committee, Centre for the Advanced Study of Collective Behaviour.
- 2020 – 2021 Contributor to Open Data Science workshop and Github, Max Planck Institute of Animal Behavior.
- 2019 – 2020 Graduate student representative, EEB Academic Program Committee, Michigan State University.
- 2019 Updated departmental best practices in graduate mentoring and redesigned departmental annual progress report for Integrative Biology (found [here](#)). Contributed to Michigan State University Graduate School Mentoring Implementation [Toolkit](#).
- 2018 – 2019 Graduate student representative, Integrative Biology Department Meetings, Michigan State University.
- 2017 – 2018 Graduate student representative, Integrative Biology Graduate Affairs Committee, Michigan State University.

Public outreach

- 2022 [Field Perspectives](#). Founder of a blog that aims to promote safe, inclusive, and diverse field research.
- 2016 – 2020 [Biology on Tap](#), Lansing MI. Founder and organizer of a monthly pub talk series.

- 2014 – 2019 Michigan State University Science Festival, East Lansing MI. Leader/presenter of public workshops about evolution in action, and designer/presenter of interactive activities.
- 2014 – 2019 Girls Math & Science Day, East Lansing MI. Designer/presenter of interactive activities for girls in grades 6-8 about field research.
- 2014 – 2019 Darwin Discovery Day at the Michigan State University Museum, East Lansing MI. Designer/presenter of interactive activities for K-12 students about biology.
- 2014 – 2018 Potter Park Zookambi, Lansing MI. Teacher at a zoo-sponsored field ecology summer camp for grades 8-12.
- 2014 – 2015 Learning to Love Hyenas, Maasai Mara, Kenya. Presenter of weekly educational talks about spotted hyena biology at tourist lodges.
- 2014 – 2015 Mara Hyena Project blog and Instagram, Maasai Mara, Kenya.
- 2008 – 2010 Beneski Museum of Natural History, Amherst MA. Collections assistant and museum tour guide.