

LILY JOHNSON-ULRICH, PhD

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Research Interests

cognitive ecology | problem-solving | decision-making | sociality | urbanization | collective movement

Education

- 2021 – Present Postdoctoral Researcher – University of Zurich
Evolutionary Biology & Environmental Studies
Advisor: Dr. Marta Manser and Dr. Ariana Strandburg-Peshkin
Topic: Meerkat communication & collective movement
- 2014 – 2020 Ph.D. – Michigan State University (MSU)
Zoology and Ecology, Evolutionary Biology, & Behavior (Dual Degree)
Advisor: Dr. Kay E. Holekamp
Dissertation: Intraspecific variation in behavioral flexibility in spotted hyenas
- 2007 – 2011 B.A. *Summa cum laude* – University of Miami
Psychology and Studio Art (Dual Major)
Minor in Biology

Peer-Reviewed publications

- Birchmeier, K., **Johnson-Ulrich, L.**, & Forss, S. (2023). The role of Umwelt in animal curiosity: A within and between species comparison of novelty exploration in mongooses [*Special Issue: Curiosity and Information Seeking in Animal Behavior Regulation*]. *Animal Behavior and Cognition*, 10(4), 329-354. DOI: 10.26451/abc.10.04.03.2023
- Johnson-Ulrich, L.**, Demartsev, V., Johnson, L., Brown, E., Strandburg-Peshkin, A., & Manser, M. B. (2023). Directional speakers as a tool for animal vocal communication studies. *Royal Society Open Science*, 10(5). <https://doi.org/10.1098/rsos.230489>
- Johnson-Ulrich, L.**, Johnson-Ulrich, Z., & Holekamp, K. E. (2022). Natural conditions and adaptive functions of problem-solving in the Carnivora. *COBEHA*, 44, 101111. DOI: 10.1016/j.cobeha.2022.101111
- Johnson-Ulrich L.**, Yirga G., Strong R. L., Holekamp K. E. (2021) The effect of urbanization on innovation in spotted hyenas. *Animal Cognition*. DOI: 10.1007/s10071-021-01494-4
- Johnson-Ulrich, L.**, Holekamp, K. E., & Hambrick, D. Z. (2020) Innovative problem-solving is reliable across time and context in wild spotted hyenas. *Scientific Reports*, 10, 13000. DOI: 10.1038/s41598-020-69953-5
- Johnson-Ulrich, L.** & Holekamp, K. E. (2020) Group size and social rank predict inhibitory control in spotted hyenas. *Animal Behavior*, 160, 157-168. DOI: 10.1016/j.anbehav.2019.11.020
- Johnson-Ulrich, L.**, Benson-Amram, S., & Holekamp, K. E. (2019) Fitness consequences of innovation in spotted hyenas. *Frontiers in Ecology and Evolution*, 7, 443. DOI: 10.3389/fevo.2019.00443.
- Santos-Rivera, M., **Johnson-Ulrich, L.**, Graham, A., Willis, E., Kouba, A. J., & Vance, C. K. (2019). 106 Assessment of fecal near infrared reflectance spectroscopy to detect and monitor the reproductive status of endangered Amur and Snow leopard females. *Reproduction, Fertility and Development*, 31(1), 179-179. DOI: 10.1071/RDv31n1Ab106
- Johnson-Ulrich, L.**, Johnson-Ulrich, Z., & Holekamp, K. (2018). Proactive behavior, but not inhibitory control, predicts repeated innovation by spotted hyenas tested with a multi-access box. *Animal Cognition*, 21(3), 379-392. DOI: 10.1007/s10071-018-1174-2.

- Johnson-Ulrich L.**, Lehmann K., Turner J., & Holekamp K. E. (2018) Hyenas – Testing cognition in the Umwelt of the spotted hyena. Pp. 244-265 in Bueno N & Amici F (Eds.) *The experimental Umwelt – a practical guide to animal cognition*. Cambridge University Press, Cambridge, UK.
- Green, D. S., **Johnson-Ulrich, L.**, Couraud, H. E., & Holekamp, K. E. (2018). Anthropogenic disturbance induces opposing population trends in spotted hyenas and African lions. *Biodiversity and Conservation*, 27(4), 871–889. DOI: 10.1007/s10531-017-1469-7

Manuscripts In-Prep or Submitted

- Demartsev, V., Averly, B., **Johnson-Ulrich, L.**, Sridhar V. H., Leonardos, L., Vining, A., Thomas, M., Manser, M. B., Strandburg-Peshkin, A. (2024). Mapping vocal interactions in space and time differentiates call-and-response vs. broadcast signalling in meerkat groups. *Philosophical Transactions of the Royal Society: B (special issue "The power of sound: unravelling how acoustic communication shapes group dynamics)* (Accepted, in press).
- Minasandra, P., Grout, E. M., Crofoot, M. C., Demartsev, V., Gersick, A. S., Hirsch, B. T., Holekamp, K., **Johnson-Ulrich, L.**, Nayak, A., Ortega, J., Roch, M. A., Strauss, E. D., Strandburg-Peshkin, A. (2024). Shared principles underlie the behavioral dynamics of animals in the wild. *Proceedings of the National Academy of Sciences* (In Prep).
- Mosia, R., Manser, M. B., Strandburg-Peshkin, A., le Roux, A., Demartsev, V., **Johnson-Ulrich, L.** (2024). Spatial position affects weight gain in meerkats (*Suricata suricatta*). *Animal Behaviour* (In Prep).
- Stalder, J., Driscoll, I., **Johnson-Ulrich, L.**, Moser, C. B., Manser, M. B. (2024). Changes in marking behavior following dominance acquisition in male and female meerkats. (In prep).
- Johnson-Ulrich, L.**, Kunjar, S., Demartsev, V., Averly, B., Mosia, R., Strandburg-Peshkin, A., Manser, M. B. (2024) Acoustic signals facilitate collective decisions about travel direction in meerkats. (In prep).

Non-Peer-Reviewed Publications

- Johnson-Ulrich, L.** & Yirga, G. (2023). Gidey Yirga: Urban spotted hyena ecology in Ethiopia. Project Biodiversify (in submission).
- Johnson-Ulrich, L.** & Pooley, A. (2020). April Pooley: Sex differences in traumatic stress response. Project Biodiversify: www.projectbiodiversify.org/april-pooley
- Johnson-Ulrich, L.** & Bruna, E. (2019). Emilio Bruna: Seed germination is lower in fragmented rainforest. Project Biodiversify: projectbiodiversify.org/emilio-bruna/
- Johnson-Ulrich, L.** (2017) The Social Intelligence Hypothesis. In: Shackelford T & Weekes-Shackelford V (Eds) *Encyclopedia of Evolutionary Psychological Science*. Springer, Cham. DOI: 10.1007/978-3-319-16999-6.
- Johnson-Ulrich, L.**, Vance, C., Kouba, A., & Willard, S. Fecal Near Infrared Reflectance Spectroscopy (FNIRS) discrimination of species and gender for Amur leopards and snow leopards (2013). *Proceedings of the 16th International Conference on Near Infrared Spectroscopy*; Jun 2-7; La Grande-Motte, France.

International Conference Presentations

- Johnson-Ulrich, L.**, Demartsev, V., Averly, B., Mosia, R., Strandburg-Peshkin, A., & Manser, M. (September 2023) ‘Move calls’ and collective decision-making in meerkats. *KRC Annual Meeting*, University of Zurich, Zurich, Switzerland (Platform presentation).

- Johnson-Ulrich, L.**, Demartsev, V., Averly, B., Mosia, R., Standburg-Peshkin, A., & Manser, M. (August 2023). Communication drives collective movement decisions in meerkats. *Behavior 2023*, Bielefeld, DE (Platform presentation).
- Johnson-Ulrich, L.**, Demartsev, V., Averly, B., Strandburg-Peshkin, A., & Manser, M. (December 2022) Collective movement decisions and ‘move calls’ in meerkats. *ASAB Winter Meeting: Animal Movement*. Edinburgh, UK (Platform presentation).
- Johnson-Ulrich, L.** (June 2022) Collective movement & navigation in meerkats. *KRC Annual Meeting*, University of Zurich, Zurich, Switzerland (Platform presentation).
- Johnson-Ulrich, L.** (June 2021) Collective movement decisions in meerkats. *KRC Annual Meeting*, Virtual Event. University of Zurich, Zurich, Switzerland (Poster).
- Johnson-Ulrich, L.** (July 2020). Social and ecological correlates of behavioral flexibility in spotted hyenas. *Annual Conference of the Animal Behavior Society: Allee Symposium*, Virtual Meeting. (Platform presentation).
- Johnson-Ulrich, L.**, Benson-Amram, S., & Holekamp, K. (July 2019) Fitness and innovation in wild spotted hyenas. *Joint meeting of the 56th Annual Conference of the Animal Behavior Society and the 36th International Ethological Conference*, Chicago, IL. (Platform presentation).
- Johnson-Ulrich, L.** & Holekamp, K. (April 2019). Social complexity and inhibitory control in spotted hyenas. *TriState Conference on Animal Learning and Behavior*, Oakland University, Rochester Hills, MI. (Platform presentation).
- Johnson-Ulrich, L.**, Strong, R.*, Yirga, G., & Holekamp, K. (August 2018) Innovation and urbanization in spotted hyenas. *International Society for Behavioral Ecology meeting*, Minneapolis, MN. (Platform presentation).
- Johnson-Ulrich, L.**, Johnson-Ulrich, Z., & Holekamp, K. (August 2018) Predictors of innovation in captive spotted hyenas. *55th Annual Conference of the Animal Behavior Society*, Milwaukee, WI. (Platform presentation).
- Johnson-Ulrich, L.**, Johnson-Ulrich, Z., Holekamp, K. (April 2016). Individual variation in problem-solving strategy with the multi-access box paradigm in spotted hyenas. *The 23rd International Conference on Comparative Cognition*. Melbourne, FL. (Platform presentation).
- Johnson-Ulrich, Z., **Johnson-Ulrich, L.**, Cater, T., Vonk, J. (April 2016). Behavioral flexibility and problem solving in captive bears. *The 23rd International Conference on Comparative Cognition*. Melbourne, FL. (Platform presentation).
- Green, D.S., Zipkin, E.F., Boydston, E.E., **Johnson-Ulrich, L.**, Couraud, H.E., & Holekamp, K.E. (Aug 2014). Long-term ecological changes at the edge of the Mara-Serengeti ecosystem. *The Ecological Society of America's Annual Conference*. Sacramento, CA (Platform presentation and poster)
- Green, D.S., **Johnson-Ulrich, L.**, Couraud, H.E., Heath, B.R., & Holekamp, K.E. (Jun 2014). Carnivore population dynamics in the Masai Mara National Reserve in relation to anthropogenic disturbance. *African large carnivores: Impacts on ecosystems and human interactions conference*. National Museums of Kenya, Nairobi, Kenya (Platform presentation and poster)
- Johnson-Ulrich, L.**, Vance, C., Kouba, A., Willard, S (2013). Fecal Near Infrared Reflectance Spectroscopy (FNIRS) discrimination of species and gender for Amur leopards and snow leopards. *16th International Conference on Near Infrared Spectroscopy*; Jun 2-7; La Grande-Motte, France. (Poster)
- Johnson-Ulrich, L.**, Vance, C., Kouba, A., Willard, S (2013). NIRS discrimination of Okapi feces to determine sex and individual identity. *16th International Conference on Near Infrared Spectroscopy*; Jun 2-7; La Grande-Motte, France. (Poster)

Invited Presentations, Seminars & Workshops

- Johnson-Ulrich, L.** (September 2023). The adaptive functions of animal cognition. *Guest Lecture for Frontiers in Animal Behavior*, University of Zurich, Zurich, CH. (Platform presentation).

- Johnson-Ulrich, L.** & Forss, S. (July 2023). Learning to adapt or exaptation? Are urban environments cognitively demanding for successful invaders? *Cognition in a changing world: latest advances in memory of Julie Morand-Ferron. Annual meeting of the Animal Behavior Society*. Portland, OR. (Platform presentation).
- Johnson-Ulrich, L.** (December 2022). Animal Cognition. *Guest Lecture for Frontiers in Animal Behavior*, University of Zurich, Zurich, CH. (Platform presentation).
- Johnson-Ulrich, L.** (April 2022) Innovative problem-solving in spotted hyenas. *Cabinets of Curiosities Workshop*. Collegium Helveticum, Zurich, Switzerland.
- Johnson-Ulrich, L.** (October 2021) Movement across scales in meerkats. *BEEES Seminar*. University of Zurich, Zurich, Switzerland (Platform presentation).
- Johnson-Ulrich, L.** (December 2020). Testing cognition in the Umwelt of the spotted hyena. *International Canine Science Seminar*, Virtual Meeting. (Platform presentation).
- Johnson-Ulrich, L.** (November 2019) The evolution of intelligence. *Guest Lecture for Ecological Aspects of Behavior*, Michigan State University, East Lansing, MI. (Platform presentation).
- Johnson-Ulrich, L.** (November 2018) The evolution of intelligence. *Guest Lecture for Ecological Aspects of Behavior*, Michigan State University, East Lansing, MI. (Platform presentation).
- Johnson-Ulrich, L.** (October 2018) The real deal: Testing cognition in spotted hyenas. *Ecology, Evolutionary Biology, & Behavior Graduate Colloquium*, Michigan State University, East Lansing, MI. (Platform presentation).

Undergraduate and MSc Mentee Presentations

- Mosia, R.*, Demartsev, V. **Johnson-Ulrich, L.** Le Roux, A. (September 2023). Collective movement in meerkats (*Suricata suricatta*): coordination and fitness consequences. *Zoological Society of Southern Africa (ZSSA): Extreme Ecology*, Winterton, Kwa-Zulu Natal, SA (Platform presentation).
- Macina, D.* & **Johnson-Ulrich, L.** (June 2022) Hyena urbanization and morphology. *101st Annual Meeting of the American Society of Mammalogists*, Tucson, AZ. (Poster).
- Macina, D.*. & **Johnson-Ulrich, L.** (April 2021) Hyena urbanization and morphology. *Annual University Undergraduate Research and Arts Forum*, Virtual Event. Michigan State University, East Lansing, MI. (Poster).
- Noeth, J*, Ohlrich, H.*, Jarvey, J., **Johnson-Ulrich, L.**, & Sawdy, M. (April 2020) Elephants Anti-Predator Moves: Juveniles spend more time closer to adults. *Annual University Undergraduate Research and Arts Forum*. Michigan State University, East Lansing, MI. (Poster).
- Leary, S*, Muhammad, Q.*, Miller, A.*, **Johnson-Ulrich, L.**, Montgomery, T., & Laubach, Z. (April 2019) The lingering effects of human disturbance on impala activity. *Annual University Undergraduate Research and Arts Forum*. Michigan State University, East Lansing, MI. (Poster).
- Leary, K.*, DeGregory, C.*, Montgomery, T., Laubach, Z., & **Johnson-Ulrich, L.** (April 2019) Responsiveness to heterospecifics alarm calls in Thomson's gazelles (*Gazella thomsoni*). *Annual University Undergraduate Research and Arts Forum*. Michigan State University, East Lansing, MI. (Poster).
- Barnes, P.*, **Johnson-Ulrich, L.** (April 2016). Does variation in behavioral traits influence problem solving in spotted hyenas? *Annual University Undergraduate Research and Arts Forum*. Michigan State University, East Lansing, MI. (Poster).

*Undergraduate or MSc co-authors

Teaching & Mentoring

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| 2023 | Teaching Assistant, BIO387: Blockkurs 'Sociobiology of communication' |
| 2022 | Teaching Assistant, BIO380: Blockkurs: 'Experimental Field Biology' |

2022 – 2023	MSc Student Mentor: Rasekuwane Mosia, ‘Collective movement in meerkats: coordination and fitness consequences’
2021	Teaching Assistant, BIO387: Blockkurs ‘Sociobiology of communication’
2020	Co-Instructor, IBIO 415: Ecological Aspects of Behavior (Remote Online), MSU
2019 – 2021	Tutor Level I, Intermediate Statistics, Tutor.com
2019	Lead Instructor, IBIO 490: Behavioral Ecology of African Mammals, MSU
2019	Teaching Assistant, IBIO 365: Biology of Mammals, MSU
2018	Teaching Assistant, IBIO 415: Ecological Aspects of Behavior, MSU
2018	Co-Instructor, IBIO 490: Behavioral Ecology of African Mammals, MSU
2016 – 2017	Graduate Mentor in Kenya- NSF International Research Experience for Students
2016 – 2017	Camp Manager – Mara Hyena Project, MSU
2016, 2019, 2020	Undergraduate Mentor: University Undergraduate Research & Arts Forum
2015, 2016	University Undergraduate Research & Arts Forum Poster Evaluator
2015	Pathways to Scientific Teaching, PLB 802 (1 credit course)
2015 – 2020	Undergraduate Research Assistant Mentoring (5 students)

Research & Wildlife Experience

2021 – Present	Postdoctoral Researcher, University of Zurich, Switzerland
2014 – 2020	PhD Student & Camp Manager, MSU, East Lansing, MI
2013 – 2014	Research Assistant, MSU Mara Hyena Project, Kenya
2012 – 2013	Conservation and Biodiversity Intern, Memphis Zoo, Memphis, TN
2011	Conservation Volunteer, Lapolosa Wilderness, Lydenberg, South Africa
2010-2011	Animal Science Intern, Zoo Miami, Miami, FL
2010	Summer Intern, Equine Research Foundation, Aptos, CA
2009 – 2010	Research Assistant, University of Miami, Bipolar Lab, Coral Gables, FL
2008 – 2012	Equestrian Wilderness Guide & Riding Instructor

Professional Affiliations

2021 – Present	Association for the Study of Animal Behaviour
2015 – Present	International Society for Behavioral Ecology
2014 – Present	Animal Behavior Society
2014 – 2020	Graduate Women in Science
2014 – 2020	BEACON Center for the Study of Evolution in Action
2015 – 2019	Society for Integrative & Comparative Biology
2014 – 2019	Comparative Cognition Society

Research Funding & Awards

2020	MSU EEBB Summer Fellowship - \$2100
2020	MSU Graduate School Dissertation Completion Fellowship – \$7000
2019	MSU EEBB Summer Fellowship – \$2000
2016	Society for Integrative & Comparative Biology Grants-In-Aid of Research – \$1000
2016	MSU Dr. Marvin Hensley Endowed Scholarship in Zoology – \$9,300
2015	MSU EEBB Summer Fellowship – \$1,800
2014	College of Natural Science Early Start Fellowship – \$6,000
2014 – 2015	MSU College of Natural Science Recruiting Fellowship – \$27,000
2014 – 2019	NSF Graduate Research Fellowship ~ \$99,000

Service & Outreach

2023	Scientifica
2021, 2022, 2023	KRC Outreach Talk
2019 – 2023	Project Biodiversify
2015, 2019	Animal Behavior Society Conference Outreach Fair
2019	MSU College of Natural Science Cultural Competency Training
2018	Biology-On-Tap
2018	Detroit Zoological Society's Fellowship in Science Communication
2018 – 2019	MSU College of Natural Science Council on Diversity & Community
2017	Queer Inclusive Leadership (QUILL) Certification
2015 – 2016	EEBB Treasurer
2015 – 2016	MSU Graduate Employees Union - IBIO Steward
2015, 2016	MSU Science Festival
2015, 2016	MSU Neuroscience Fair
2015, 2016	Darwin Discovery Day
2015	MSU Girls Math & Science Day

Professional References

Dr. Kay E. Holekamp
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 University Distinguished Professor
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