

Heather J.B. Brooks

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Education

Ph.D. in Psychology 2025

University of Tennessee, Knoxville

Area: Neuroscience and Behavior

Dissertation title: Examining *chick-a-dee* call characteristics as a novel behavioral syndrome in mixed flocks of tufted titmice (*Baeolophus bicolor*) and Carolina chickadees (*Poecile Carolinensis*)

Committee: Todd Freeberg (Chair), Gordon Burghardt, Elizabeth Derryberry, David Buehler, Matthew Cooper

BS in Natural Resources and Environmental Science (NRES) 2017

University of Illinois, Urbana-Champaign

Area: Fish, Wildlife, and Conservation Biology

Minor: Integrative Biology

Research Interests

Social behaviors; Interspecific interactions; animal communication; personality and repeatable characteristics; dominance interactions; animal welfare; and conservation education

Research Experience

Postdoctoral Associate 2025–present

BioFrontiers Institute, University of Colorado, Boulder

- Currently working on communication and cognition in firefly species

Doctoral researcher 2020–2025

Department of Psychology, University of Tennessee, Knoxville

- Examined whether different aspects of communication (call rate, note type composition, and spectral qualities) are repeatable within individual across different social contexts (flock composition, dominance), and how these communicative traits might be related to other commonly studied behavioral assays (stress responses, exploration, and activity level); examined in conspecific and mixed-species flocks of Carolina chickadees and tufted titmice

- Conducted a playback study to see whether wild mixed-species flocks of birds respond differently to stimuli representing different configurations of flock members
- Assisted with a study that looked at whether exposure to play interactions within a cohort of hamsters influences dominance behaviors or affects hormone expression in the brain
- Examined the prevalence of nonhuman mixed-species play interactions in scientific literature and social media videos, as well as which species were recorded playing with each other and the types of play that was occurring
- Assisted with data collection for influence of traffic noise on white-breasted nuthatches
- Compared tufted titmice calls with calls from black-crested titmice

Volunteer

2023–2025

Zoo Knoxville, Knoxville, Tennessee

- Assisting the conservation science team with their research needs, such as their study on environment and foraging behavior in their African elephants

Pinniped behavior intern

2018–2019

Smithsonian National Zoological Park, Washington D.C.

- Collected live behavioral data on a sea lion with a known welfare concern (excessive regurgitation); analyzed and presented data to zookeepers, curators, welfare scientists, and veterinary staff
- Developed and implemented a pilot study on seal enrichment use in comparison with zookeeper estimates of enrichment use; analyzed and presented data to zookeeper team and welfare scientists

Carnivore behavior intern

2018

Brookfield Zoo Chicago, Brookfield, Illinois

- Collected live behavioral data on 23 species of carnivores within the zoo's collection, including big cats, wolves, bears, and marine mammals; created a literature database in Mendeley for the behavior and welfare team; analyzed data and presented to zoo curators
- Designed and analyzed a short study looking at rates of welfare-linked behaviors (e.g., sleep, play, and stereotypies) and natural species home range using longitudinal data
- Preparation and data collection for an audience research study using zoo members; examined educational outcomes in three modes of presenting conservation information

Undergraduate field course

2017

Department of NRES, University of Illinois, Urbana-Champaign

- Assisted staff at the Forbes Biological Station with collecting (rocket netting and funnel traps) and banding local migratory waterbirds, including lesser scaup, mallards, loons, etc., for course credit

Undergraduate field course	2016
<i>Department of Environmental Science, University of York, United Kingdom</i>	
<ul style="list-style-type: none"> Collected data on peat cores, vegetation quadrat samples, and land surveys in North York Moors; basic analyses and wrote up results for course credit 	
Undergraduate researcher	2015
<i>Illinois Natural History Survey, Urbana, Illinois</i>	
<ul style="list-style-type: none"> Led a project on bluegill sunfish behavior under the supervision of a Ph.D. student. Captured, PIT tagged, drew blood, and conducted angling and bold/shy trials; analyzed and wrote up results for course credit 	
Lab technician	2015
<i>Illinois Natural History Survey, Urbana, Illinois</i>	
<ul style="list-style-type: none"> Collected and floy tagged three species of ancient sport fish (gar and bowfin) from local waterways with seining and electrofishing; dissected and took bone/tissue samples from previously collected fish to examine the optimal method of aging the individuals Assisted with behavioral data collection on small mouth bass 	
Additional animal husbandry and handling experience	2013–2020
<ul style="list-style-type: none"> Including several species of domesticated farm animals, laboratory bred mice (including immunocompromised mice), laboratory raised zebrafish, and many common species of pet rodents, fish, birds, and reptiles 	

Teaching Experience

Instructor of record – PSYC 310 – Learning and Thinking	Fall 2022, 2023, 2024
<i>Department of Psychology, University of Tennessee, Knoxville</i>	
<ul style="list-style-type: none"> Prepared and presented lectures, class activities, semester-long projects, and exams on how humans and other animals develop behavior, including reflexes, classical conditioning, operant conditioning, and social learning Taught two sections per day of 85 to 100 students (170 to 200 students total), three days per week Managed teaching assistants and undergraduate teaching fellows 	
Instructor of record, section leader – PSYC 294 – Research Methods Lab	2021–2022
<i>Department of Psychology, University of Tennessee, Knoxville</i>	
<ul style="list-style-type: none"> Prepared brief lectures and class activities in conjunction with other section leaders on basic research methods such as designing an experiment, collecting data, basic analysis, and writing a manuscript Two sections once per week, 20 to 25 students (40 to 50 students total) 	

Teaching assistant – PSYC 310 (above) & PSYC 295 – Research Methods

2020–2021

Department of Psychology, University of Tennessee, Knoxville

- Primary duties were grading exams and projects, proctoring exams, meeting with students to assist them with the course material, and guest lecturing on occasion
- Two sections of a class with 100 students per class, and two sections of a class with 30 students per class (260 students total)

Publications

2025

Brooks, H. J. B., & Freeberg, T. M. (Submitted). A comparison of calls of two closely related species: Tufted titmice (*Baeolophus bicolor*) and black-crested titmice (*B. atricristatus*).

Whitten, C. J., Kelly, J., Gillespie, A. L., **Brooks, H. J. B.**, Hooker, M. K., Radford, A., Hennon, L. M., Kilgore, B. J., Singamaneni, Y. B., Schulz, K., Burghardt, G. M., & Cooper, M. A. (2025). From play date to stress fate: Juvenile social play rescues stress-induced changes in adult social behavior. *Developmental Psychobiology*, 67(1):e70020.

2024

Brooks, H. J. B. (2024). Monkeying around on Twitter (now X): How big data and social media can be harnessed by zoos and other animal care facilities to examine public opinion trends. *Journal of Zoo and Aquarium Research*, 12(3): 185–194.

Brooks, H. J. B., & Freeberg, T. M. (2024). Single-species and multi-species playbacks elicit asymmetrical responses within mixed-species chickadee, titmouse, and nuthatch flocks. *Ethology*, 130(6): e13459.

2023

Brooks, H. J. B., & Burghardt, G. M. (2023). A review of interspecific social play among nonhuman animals. *Neuroscience and Biobehavioral Reviews*, 151:105232.

2020

Miller, L. J., Luebke, J. F., Matiassek, J., Granger, D. A., Razal, C., **Brooks, H. J. B.**, & Maas, K. (2020). The impact of in-person and video recorded animal experiences on zoo visitors' cognition, affect, empathy, and conservation intent. *Zoo Biology*, 39(6):367–373.

Presentations

Oral presentations

Brooks, H. J. B., & Freeberg, T. M. (2024 July). *Single species and multi-species playbacks elicit asymmetrical responses within mixed-species parid flocks*. Presented at the Association of Field Ornithologists, Society of Canadian Ornithologists, and Wilson Ornithological Society joint conference. Peoria, Illinois.

Brooks, H. J. B., & Freeberg, T. M. (2024 June). *Single species and multi-species playbacks elicit asymmetrical responses within mixed-species parid flocks*. Presented at the Animal Behavior Society annual conference. London, Ontario, Canada.

Poster presentations

Brooks, H. J. B., & Burghardt, G. M. (2022 November). *A comparative review of interspecific social play among nonhuman animals*. Poster presented at the NeuroNET Fall Retreat. Knoxville, Tennessee.

Brooks, H. J. B., & Burghardt, G. M. (2022 July). *A comparative review of interspecific social play among nonhuman animals*. Poster presented at the Animal Behavior Society annual conference. San Jose, Costa Rica.

Professional Development

Mentorship

2021–2025

Department of Psychology, University of Tennessee, Knoxville

- Mentored nine undergraduate students and one high school student in research methods in the field, using BORIS and NOLDIS observer, using audio coding software, data analysis, science writing, and presentation

Field Inclusive Social Safety workshop

2024

Field Inclusive

Facilitating Undergraduate Evidence-Based Learning workshop (FUEL)

2021

Center for the Integration of Research in Teaching and Learning (CIRTL)

Grants and Funding

2025 Animal Behavior Society Student Research Grant – \$1950

2024 UTK Department of Psychology Dissertation Support Grant – \$475

2023 UTK Student-Faculty Research Award – \$2550

Awards and Honors

University of Illinois, Urbana-Champaign

Jonathan Baldwin Turner Scholar

Hunter Scholar

James Scholar

Dean's List

Academic and Community Service

Manuscript peer review

Behavioral Processes

Journal of Comparative Psychology

Diversity Council member	2023–2025
<i>Department of Psychology, University of Tennessee, Knoxville</i>	
<ul style="list-style-type: none"> Recruitment and retention subcommittee, worked to consolidate existing metrics for retention, as well as surveyed existing students, staff, and faculty about current needs 	
Additional university service	
<i>Department of Psychology, University of Tennessee, Knoxville</i>	
<ul style="list-style-type: none"> Organized graduate student component of the 2023 prospective student interview weekend Student representative for the 2023 external mid-cycle departmental review 	
Volunteer, STEM outreach	2025
<i>ZooCrew, Zoo Knoxville, Knoxville, Tennessee</i>	
<ul style="list-style-type: none"> Organized and co-led experiments on cockroach behavior with high-school aged students 	
Volunteer, STEM outreach	2024–2025
<i>gSTEM, Youth Outreach in STEM, Knoxville, Tennessee</i>	
<ul style="list-style-type: none"> Co-mentoring middle school girls in a once-per-week afterschool program. Working with students on science experiments and other activities 	
Volunteer	2023–2025
<i>Zoo Knoxville, Knoxville, Tennessee</i>	
<ul style="list-style-type: none"> Assisting the education and nutritional services departments, and volunteering for the 2023 AZA herpetology TAG meeting; developed and organized a novel zoo visitor outreach station on the effects of acoustic noise on bird behavior 	
Volunteer, STEM outreach	2014
<i>REACT Program, University of Illinois, Urbana-Champaign</i>	
<ul style="list-style-type: none"> Traveled to a local elementary school to demonstrate basic chemistry experiments 	
Volunteer, STEM outreach	2012
<i>Girls Engaged in Math and Science (GEMS), University of Illinois, Urbana-Champaign</i>	
<ul style="list-style-type: none"> Assisted with a short camp for middle school girls to teach basic computer coding skills. I helped the campers troubleshoot their code in the software LINDA 	

Professional Associations

Animal Behavior Society (2022–present)
Wilson Ornithological Society (2024–present)
Wildlife Society (2017–2019)

Skills and Certifications

AVISOFIT SASlab Pro, BORIS, NOLDIS Observer, EthoTrak, ZooMonitor, R, SCUBA open water, CIRTIL Associate Certification