Dogs: Behavior, Evolution, and Domestication

Fall Semester 2024
Instructor: Dr. Erin Hecht, Ph.D.
Teaching fellow: Sophie Barton, M.A.

Course description

What makes dogs behave the way they do, and what can this teach us about our own species? In this seminar course, we will explore the evolution of canine behavior through the lens of ethology, and carry out a real dog behavior experiment as a class. We will discuss current research on the evolutionary history of dogs, and consider whether this might parallel some aspects of human evolution. We will also examine communication, cooperation, attachment, and other aspects of behavior in dogs, humans, and other species. Students will learn to understand behavior as an adaptive, evolved trait and consider artificial selection as a window on mechanisms of behavior evolution. In the weekly 3-hour lab, students will also receive hands-on training in the collection and analysis of dog behavior data.

This course counts as a Junior Research Seminar for HEB concentrators. It is capped at 12 students. There are no prerequisites and no final exam. Cross-registration is allowed. It is open to both undergraduate and graduate students. This course involves and requires interacting with dogs. Students will receive instruction on how to safely interact with dogs in the course.

Instructors

Erin Hecht, Ph.D. is an Assistant Professor in the Department of Human Evolutionary Biology. Dr. Hecht received her B.S. in Cognitive Science from the University of California San Diego. She received her Ph.D. in Neuroscience from Emory University. Prior to joining the faculty at Harvard, she was a research scientist at the Center for Behavioral Neuroscience at Georgia State University and an Affiliated Scientist at the Emory National Primate Research Center. Her lab studies brain-behavior evolution in dogs, foxes, primates, and humans. She has a miniature Australian Shepherd, Izzy, who is equal parts good dog and mischievous troublemaker.

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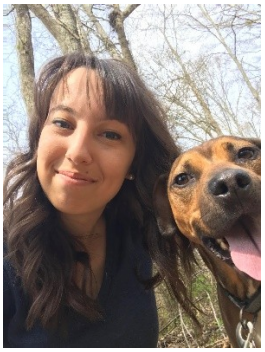

Sophie Barton, M.A. is a Ph.D. Candidate in the Hecht lab at the Department of Human Evolutionary Biology. She earned her B.S. in Psychology and B.A. in Linguistics from the University of Georgia in 2019. Her research investigates how selection for complex behaviors shapes the brains of domestic dog breeds and other canids. Sophie draws inspiration from her rescue dog Tamsin, an Australian Shepherd x Labrador Retriever mix, who helps pilot her studies.

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Who should take this course?

This course does not assume any background training in animal behavior, evolution, or analytic methods. It will cover basic principles in the evolution and measurement of behavior, as well as specific research topics relevant to the evolved behavioral adaptations of dogs, humans, and other species. The course may be of interest to students of Human Evolutionary Biology, Psychology, Neuroscience, Organismic and Evolutionary Biology, and anyone else interested in learning to view the evolution of behavior of dogs and humans within the context of the broader animal kingdom.

Readings

All assigned readings will be available on the course's Canvas site. Readings should be done before the date for which they are assigned. Students should be ready to actively engage in discussion about the readings in class.

Course Policies and Expectations

Engagement: The instructors need your help to make this course a successful and enjoyable learning experience. Students are expected to be mentally present, attentive, and engaged during class sessions. During class sessions where we are carrying out dog behavior testing, you are expected to be on-time and to behave in a professional manner toward the dogs' owners; you will be acting as representatives of the Hecht lab and of Harvard University. Students are expected to refrain from engaging in non-class activities on the computer, phone, or other devices while participating in class sessions.

Respectful discourse: Students are expected to engage in classroom discussion in a respectful and professional manner. Disagreement is allowed; disrespect is not. Any students who feel uncomfortable are invited and encouraged to discuss their reactions and concerns with the instructors.

Academic integrity: This class is organized to facilitate collaboration among students. However, the work you turn in should be your own. All assignments may be completed with feedback from other students, but must be in your own words. All work must be appropriately cited, and all direct quotations must be in quotation marks. We expect all students to abide by the Honor Code and to work on this class with full awareness of what academic integrity means.

Use of generative AI: Certain assignments in this course may permit the use of generative artificial intelligence (GAI) tools such as ChatGPT. The default is that such use is disallowed unless otherwise stated. Any such use must be appropriately acknowledged and cited. It is each student's responsibility to assess the validity and applicability of any GAI output that is submitted; you bear the final responsibility. Violations of this policy will be considered academic misconduct. We draw your attention to the fact that different classes at Harvard could implement different AI policies, and it is the student's responsibility to conform to expectations for each course.

Late work and absences: We recognize that life can be unpredictable. Students who are experiencing extenuating circumstances or other issues that impact their learning are encouraged to talk with the course instructors in advance to allow for alternative arrangements.

Assignments & Grading

In order for our seminar discussions to be successful, students must actively engage with the reading material and contribute to discussion in class. And in order for our in-class dog behavior experiment to be successful, students must be present and participate. Consequently, 60% of the grade for this course is dependent on participation. The remaining 40% is allocated for assignments related to the course project, in which students will analyze data and present findings from our dog behavior experiments.

Points	Description
20.....	**Discussion questions:** There are weekly assigned readings and discussion questions. Students must submit ~1/2 page responses to the discussion questions by midnight the night before the class session where the articles will be discussed. Students must also submit 1 additional question (which does not need to be answered) that we will discuss in class.
20.....	**Attendance and participation:** We will collect dog behavior data during class meeting times. Students must be present and participate in these sessions unless prior written permission is granted by the instructors. Students will not be permitted to participate in dog behavior testing until they have completed on-boarding for our IACUC and IRB protocols, so failure to complete the on-boarding process in time to participate in behavior testing will result in a grade reduction. In addition to in-lab dog behavior testing in, this course involves lab sessions where you will learn to carry out dog behavior testing experiments and analyze video data.
30.....	**Video coding:** 14 points each for draft coding (for inter-rater reliability assessment) and final coding.
30.....	**Final presentation:** 6 points each for summary of relevant prior research, description of methods, presentation of results, discussion, and overall clarity and professionalism.
100.....	**Total points possible**

Sections

3 students will be assigned to each of the following 4 sections for dog behavior testing in NW B435.80:

Section A: Monday 9:00-10:15 AM

Section B: Monday 10:30-11:45 AM

Section C: Friday 3:00-4:15 PM

Section D: Tuesday 4:30-5:45 PM

Course Schedule

Week 1
No section this week
Tues. Sept. 3.....Introduction to this course / how to read a scientific paper.....MCZ 539
Thurs. Sept. 5.....Ethics in research: IACUC & IRB on-boarding session.....MCZ 539
Fri. Sept. 6.....**IACUC and IRB on-boarding assignments due 11:59 PM**

Week 2
Section.....Training for behavior testing.....Meet in MCZ 359 → walk to NW B435.80
Mon. Sept. 9.....**Discussion questions due at 11:59 PM**
Tues. Sept. 10.....Introduction to the study of behavior.....MCZ 539
Thurs. Sept. 12.....Reading canine communication signals; safe dog handling.....MCZ 539
Guest: Katie Dabney, MS
Fri. Sept. 13.....**Dog safety quiz due 11:59 PM**

Week 3
Section.....Dog behavior testing.....NW B435.80
Mon. Sept. 16.....**Discussion questions due 11:59 PM**
Tues. Sept. 17.....Behavior, domestication, and evolution - part 1.....MCZ 539
Thurs. Sept. 19.....Methods in behavior research (how to do video coding).....MCZ 539

Week 4
Section.....Dog behavior testing.....NW B435.80
Mon. Sept. 23.....**Discussion questions due 11:59 PM**
Tues. Sept. 24.....Behavior, domestication, and evolution - part 2.....MCZ 539
Thurs. Sept. 26.....Work together in class on reliability coding assignments.....MCZ 539
Fri. Sept. 27.....**Reliability coding due 11:59 PM**

Week 5
Section.....Dog behavior testing.....NW B435.80
Mon. Sept. 30.....**Discussion questions due 11:59 PM**
Reliability coding assignment due 11:59 PM
Tues. Oct. 1.....Attachment.....MCZ 539
Thurs. Oct. 3.....Measuring child-dog bonds.....MCZ 539
Guest: Dr. Olivia Reilly

Week 6
Section.....Dog behavior testing.....NW B435.80
Tues. Oct. 8.....Collaborative video coding session.....MCZ 539
Thurs. Oct. 10.....Hypothesis design and the scientific method.....MCZ 539

Week 7
Section.....Dog behavior testing.....NW B435.80
Mon. Oct. 14.....**Discussion questions due 11:59 PM**
Tues. Oct. 15.....Communication.....MCZ 539
Thurs. Oct. 17.....Can dogs talk? Augmented communication in social media.....MCZ 539

Week 8
Section.....Dog behavior testing.....NW B435.80
Mon. Oct. 21.....**Discussion questions due 11:59 PM**
Tues. Oct. 22.....Empathy.....MCZ 539
Thurs. Oct. 24.....Impacts of traumatic experiences in dogs.....MCZ 539
Guest: Dr. Julia Espinosa

Week 9
Section.....Dog behavior testing.....NW B435.80
Mon. Oct. 28.....**Discussion questions due 11:59 PM**
Tues. Oct. 29.....Lateralization & asymmetry.....MCZ 539
Thurs. Oct. 31.....Dog brains 101.....MCZ 539
Fri. Nov. 1.....**Hypotheses due 11:59 PM**

Week 10
Section.....Dog behavior testing.....NW B435.80
Mon. Nov. 4.....**Discussion questions due 11:59 PM**
Tues. Nov. 5.....Cooperation .....MCZ 539
Thurs. Nov. 7.....Statistical hypothesis testing.....MCZ 539
Fri. Nov. 8.....**Final coding due 11:59 PM**

Week 11
Section.....Statistics office hours.....MCZ 539
Tues. Nov. 12.....Dog emotions in popular media & social media.....MCZ 539
Thurs. Nov. 14.....Working dog demonstration.....MCZ 539

Week 12
No section this week
Mon. Nov. 18.....**Presentation slides due 11:59 PM**
Tues. Nov. 19.....Presentations.....MCZ 539
Thurs. Nov. 21.....Presentations.....MCZ 539

Week 13
No section this week
Mon. Nov. 25.....**Roundtable discussion questions due 11:59 PM**
Tues. Nov. 26.....Presentations.....MCZ 539
Thurs. Nov. 28.....*No class (holiday)*

Week 14
No section this week
Tues. Dec. 3.....Roundtable discussion.....MCZ 539