

HEB 1389 – Spring 2020
Coming of Age on Planet Earth

Barbara Natterson-Horowitz, M.D.
Visiting Professor, Department of Human Evolutionary Biology
E-mail: natterson-horowitz@fas.harvard.edu

Lecture: Fridays, 3:00 – 5:45pm, DeVore Conference Room, Museum of Comparative Zoology (MCZ) 529

Professor's Office Hours: Wednesdays 2-4pm and Thursdays 10am-12pm (unless otherwise noted), or by appointment, Peabody Room 47

Course Description and Format

The challenges of adult maturation are not unique to our species. Some young adult animals take risks and lose their lives, others respond to stress with eating problems or to traumatic first sexual encounters with subsequent dysfunction. This seminar-style course will use a comparative approach to explore how young adult animals learn to be safe, how they acquire or lose status and rank, how they come of age sexually, and how they learn to survive and thrive on their own. We will review literature from scientific fields (behavioral ecology, endocrinology and evolutionary biology among others) and the social sciences and humanities (contemporary commentary on young adult life and coming of age literature) for a comparative analysis of the common challenges of maturation across the animal kingdom and in human life.

In “Coming of Age on Planet Earth,” students will develop knowledge of eco-evolutionary principles and explore the application of behavioral ecology to our understanding of adolescent and young adult development. Each week, all students will be expected to complete the assigned readings and one student group will serve as lecturers and lead discussants for that week's reading assignments. Each group will be responsible for a 30-minute presentation on the week's contents and facilitate a 30-minute discussion. All students are required to prepare 3 questions based on the assigned readings to facilitate discussion with the discussion leaders of the week.

Course Objectives

1. Students will develop an understanding of stages of maturation across the animal kingdom.
2. Students will develop an understanding of how young adult animals learn to stay safe, to navigate social hierarchies, to be sexual and to survive.
3. Students will develop awareness of how the principles of behavioral ecology and evolutionary biology can be used to better understand young adult development.

Course Materials (required)

1. *Wildhood* by Natterson-Horowitz and Bowers (ISBN: 978-1501164699)
2. *Sex, Teens and Everything in Between* by Zaloom (ISBN: 978-1492680086)
3. *The Meritocracy Myth* by McNamee (ISBN: 978-1538103401)

Grading

20% Weekly Writing Assignment
20% In-Class Discussion
20% Midterm Exam
15% Individual Presentation
25% Final Exam

Weekly Writing Assignment (20%)

Note that the reading assignments below are subject to change with advanced notice from the professor. You are expected to prepare for class meetings by completing the assigned reading assignments and writing a weekly response to a prompt. The intent of this weekly assignment is to motivate students to complete the assigned readings and apply what is learned from them and from class lectures. More instructions will be provided for each weekly writing assignment during class. Each weekly assignment is due on Fridays by 3:00pm via Canvas upload.

In-Class Discussion (20%)

Students are expected to actively engage in discussion by asking questions and/or responding to the Professor's Q&A engagement.

Take-Home Midterm Exam (20%)

A take-home midterm exam will be distributed via Canvas on Sunday, March 8th at 11:00am and will be due on Thursday, March 13th at 11:00am. More details about the midterm exam will be shared during class and in discussion. Midterm exams are to be submitted via Canvas upload. Late submissions will receive a 10% deduction on your final exam per 24-hour period.

Individual Presentation (15%)

Each student will be assigned a topic and a date to give an in-class presentation. More details will be provided in class.

Take-Home Final Exam (25%)

A take-home final exam will be distributed on Thursday, April 30th at 11:00am via email and will be available on Canvas. It is due by 11:00am on Monday, May 4th via Canvas upload. Late submissions will receive a 10% deduction on your final exam per 24-hour period. More details about the final exam and its due date will be provided during class.

Academic Integrity

All written work must be in a student's own words and represent original thought. The ideas of others as well as quotations must be properly attributed; more than six words copied from another source without proper reference constitute plagiarism.

Assignments/papers cannot be made up, except under rare circumstances when prior permission has been granted by the instructor. With regard to plagiarism and/or cheating, please refer to the Harvard Academic Integrity and Academic Dishonesty policy. It can be found at <https://handbook.fas.harvard.edu/book/academic-integrity>. Please review it carefully and contact Dr. Natterson-Horowitz if you have any questions.

Students with Disabilities

Harvard makes reasonable academic accommodations for qualified students with disabilities. To receive academic and classroom disability accommodations, students must first consult with the

Harvard Accessible Education office. A counselor will work with the student and academic department to provide reasonable academic accommodations. For more information, visit <http://aeo.fas.harvard.edu>, call 1-617-496-8707, and/or email AEO@fas.harvard.edu.

COURSE SCHEDULE AND READING ASSIGNMENTS

****Reading Assignments Subject to Change with Advanced Notice****

TERM WEEK	CLASS DATE	TOPICS and READINGS
Week 1	January 31 st	<ul style="list-style-type: none"> • Course Overview • Review Syllabus and Expectations • BECOMING AN ADULT IN THE ANIMAL WORLD
Week 2	February 7 th	<ul style="list-style-type: none"> • MATURATION: INSIDE OUT VS. OUTSIDE IN • INTRODUCTION TO APPLIED BEHAVIORAL ECOLOGY <ul style="list-style-type: none"> ➤ Limitations vs. Opportunities • Student Pairs for Upcoming Lessons <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Prologue, pp. 1-18. 2. Fuhrmann, Delia, Lisa J. Knoll, Sarah-Jayne Blakemore. Adolescence as a Sensitive Period of Brain Development. <i>Trends in Cognitive Sciences</i> 2015, 19(10): 558-566. <p><u>Supplemental readings (optional)</u></p> <ol style="list-style-type: none"> 3. Library of Congress Exhibition. Margaret Mead. Human Nature and the Power of Culture. Samoa: The Adolescent Girl. 4. Sloan Wilson, David and Anne B. Clark. On the inappropriate use of the naturalistic fallacy in evolutionary psychology. <i>Biology and Philosophy</i> 2003. 18:669-682. 5. Anderson, Susan L. Commentary on the special issue on the adolescent brain: Adolescence, trajectories, and the importance of prevention. <i>Neuroscience and Biobehavioral Reviews</i> 2016, 70: 329-333.
Week 3	February 14 th	<ul style="list-style-type: none"> • Phylogeny and Tinbergian Analysis
Week 4	February 21 st	<ul style="list-style-type: none"> • SAFETY: THE CHALLENGE OF INEXPERIENCE <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Safety, pp. 21-66. 2. Blumstein, Daniel T. Fourteen Security Lessons from Antipredator Behavior from Natural Security: A Darwinian Approach to a Dangerous World, pp.147-158, University of California Press, 2008. 3. Sadleir, Richard MFS and Wayne L. Linklater. Annual and seasonal patterns in wildlife road-kill and their relationship with traffic density. <i>New Zealand Journal of Zoology</i> 2016. 43(3):275-291.

TERM WEEK	CLASS DATE	TOPICS and READINGS
		<p><u>Supplemental readings (optional)</u></p> <ol style="list-style-type: none"> 4. Blaszczyk, Maryjka B. Boldness towards novel objects predicts predator inspection in wild vervet monkeys. <i>Animal Behavior</i> 2017. 123:91-100. 5. Klenzendorf, Sybille A. Population dynamics of Virginia's hunted black bear population. Dissertation 2002, Virginia Polytechnic Institute and State University.
Week 5	February 28 th *No Wed Office Hours*	<ul style="list-style-type: none"> • SAFETY STRATEGIES <ul style="list-style-type: none"> ➤ Predator Inspection ➤ Stotting – Signals of Unprofitability ➤ Mobbing <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Safety, pp. 67-89. 2. Koivula, Kari, Seppo Rytönen and Marukku Orell. Hunger-dependency of hiding behaviour after a predator attack in dominant and subordinate willow tits. <i>ARDEA</i> 1995. 83(2):397-404. 3. Pravosudov, Vladimir V., et al. Social Dominance and Energy Reserves in Wintering Woodland Birds. <i>The Condor</i> 101 (1999): 880-884. https://www.jstor.org/stable/1370081?seq=1
Week 6	March 6 th	<p>A take-home midterm exam will be distributed via Canvas on Sunday, March 8th at 11:00am and will be due on Thursday, March 13th at 11:00am. More details about the midterm exam will be shared during class and in discussion. Midterm exams are to be submitted via Canvas upload. Late submissions will receive a 10% deduction on your final exam per 24-hour period.</p> <ul style="list-style-type: none"> • THE RULES OF GROUPS <ul style="list-style-type: none"> ➤ Merit vs. Unearned Advantages ➤ Parental Rank Inheritance ➤ Association with High Status Animals <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Status, pp. 93-128. 2. <i>Meritocracy</i>: Intro, Myth of Merit and Conclusion <p><u>Supplemental readings (optional)</u></p> <ol style="list-style-type: none"> 3. McDonald, Nicholas, Sean A. Rands, Francesca Hill, Charlotte Elder, and Christos C. Ioannou. Consensus and experience trump leadership, suppressing individual personality during social foraging. <i>Science Advances</i> 2016. 2(9):e1600892.

TERM WEEK	CLASS DATE	TOPICS and READINGS
		<p>4. Grosenick, Logan, Tricia S. Clement, and Russell D. Fernald. Fish can infer social rank by observation alone. <i>Nature</i> 2007; 445:429-432.</p> <p>5. Faria, Jolyon J, John RG Dyer, Colin R Tosh and Jens Krause. Leadership and social information use in human crowds. <i>Animal Behaviour</i> 2010. 79:895-901.</p>
Week 7	March 13 th	<ul style="list-style-type: none"> • THE RULES OF GROUPS <ul style="list-style-type: none"> ➤ Status Sorting ➤ Status, Serotonin and Mood <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Status, pp. 129-158 2. Norton, Michael I. All Ranks Are Local: Why Humans are both (Painfully) Aware and (Surprisingly) Unaware of Their Lot in Life. <i>Psychological Inquiry</i> 2013. 24(2):124-125. 3. Chiao, Joan Y. Neural basis of social status hierarchy across species. <i>Current Opinion in Neurobiology</i> 2010. 20:1-7. 4. Prinstein: Chapters 6, 7, 8 5. (Abstract only) Loveland, Jasmine L., Natalie Uy, Karen P. Maruska, Russ E. Carpenter and Russell D. Fernald. Social status differences regulate the serotonergic system of cichlid fish, <i>Astatotilapia burtoni</i>. <i>The Journal of Experimental Biology</i> 2014. 217:2680-2690. 6. (Abstract only) Larson ET and CH Summers. Serotonin reverses dominant social status. <i>Behav Brain Res</i> 2001. 121(1-2):95-102. 7. (Abstract only) Maruska KP, L Becker, A Neboori, RD Fernand. Social descent with territory loss causes rapid behavioral, endocrine and transcriptional changes in the brain. <i>J Exp Biol</i> 2013. 216(19):3656-66. <p><u>Supplemental readings (optional)</u></p> <ol style="list-style-type: none"> 8. Heckers, Stephan, Martin Zalesak, Anthony P. Weiss, Tali Ditman and Debra Titone. Hippocampal Activation During Transitive Inference in Humans. <i>Hippocampus</i> 2004. 14:153-162.
Week 8	March 20 th	No Class – Spring Recess
Week 9	March 27 th	<ul style="list-style-type: none"> • THE RULES OF GROUPS <ul style="list-style-type: none"> ➤ Status Reversals ➤ The Oddity Effect ➤ Leadership vs. Dominance

TERM WEEK	CLASS DATE	TOPICS and READINGS
		<p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. ScienceAlert. Fish conformity zealous but discerning. May 14, 2008. 2. Taylor, Anna-Louise. Goshawks attack ‘odd-coloured’ pigeons. <i>BBC Nature News</i>. April 13, 2012. 3. Landeau, Laurie, John Terborgh. Oddity and the ‘confusion effect’ in predation. <i>Animal Behaviour</i> 1986. 34(5):1372-1380. 4. Sarova, Radka, Marek Spinka, Jose L. Arias Panama, Petr Simecek. Graded leadership by dominant animals in a herd of female beef cattle on pasture. <i>Animal Behaviour</i> 2010. 79:1037-1045. <p><u>Supplemental reading (optional)</u></p> <ol style="list-style-type: none"> 5. Farine, Damien R., Lucy M. Aplin, Colin J. Garroway, Richard P. Mann, Ben C. Sheldon. Collective decision making and social interaction rules in mixed-species flocks of songbirds. <i>Animal Behaviour</i> 2014. 95:173-182.
Week 10	April 3 rd	<ul style="list-style-type: none"> • THE RULES OF ANIMAL COURTSHIP <ul style="list-style-type: none"> ➤ Sexual Maturity and Sexual Readiness ➤ Cues of Receptivity and Non-Receptivity <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood: Sex</i>, pp. 161-207. 2. <i>Sex, Teens and Everything in Between</i>: p. 7 and the glossary of terms: 184-217; 252-257. 3. Roupinian, Kristen. Cat Person. <i>The New Yorker</i>. December 11, 2017. Retrieved from https://www.newyorker.com/magazine/2017/12/11/cat-person 4. Gay, Mara. Is Text Messaging Killing Courtship? <i>The Atlantic</i>. November 3, 2009. Retrieved from https://www.theatlantic.com/national/archive/2009/11/is-text-messaging-killing-courtship/341795/.. 5. Harris, Heather S, Stori C Oates, Michelle M Staedler, M Tim Tinker, David A Jessup, James T Harvey and Melissa A Miller. Lesions and Behavior Associated with Forced Copulation of Juvenile Pacific Harbor Seals (<i>Phoca vitulina richardsi</i>) by Southern Sea Otters (<i>Enhydra lutris nereis</i>). <i>Aquatic Mammals</i> 2010. 36(4):331-341. (NOTE: GRAPHIC) <p><u>Supplemental readings (optional)</u></p>

TERM WEEK	CLASS DATE	TOPICS and READINGS
		<p>6. Abrams, Lindsay. Study: How We Lose Our Virginity Shapes our Entire Sexual Life. <i>The Atlantic</i>. Retrieved from https://www.theatlantic.com/health/archive/2013/01/study-how-we-lose-our-virginity-shapes-our-entire-sexual-life/272596/.</p> <p>7. EquiMed. Sexual Maturity in Stallions and Mares. What You Need To Know. December 9, 2015. Retrieved from http://equimed.com/health-centers/reproductive-care/sexual-maturity-in-stallions-and-mares-what-you-need-to-know.</p>
Week 11	April 10 th	<ul style="list-style-type: none"> • DISPERSAL <ul style="list-style-type: none"> ➤ Parent-Offspring Conflict ➤ ‘Helicopter Parents’ in Nature ➤ Extended vs. Limited Parental Care of Adult Dispersed Animals <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Dispersal, pp. 211-261. 2. Dickinson, Janis L, Elise D Ferree, Caitlin A Stern, Rose Swift and Benjamin Zuckerberg. Delayed dispersal in western bluebirds: teasing apart the importance of resources and parents. <i>Behavioral Ecology</i> 2014. 25(4):843-851. 3. Scigliano, Tony. For some birds, leaving the nest may not be so scary. Extended parental care in Galapagos penguins. <i>Daily UW</i>. April 3, 2017. 4. Capps, Kriston. Millennials Not Leaving The Nest Raises Alarms. <i>The Atlantic</i>. August 27, 2015. Retrieved from https://www.theatlantic.com/politics/archive/2015/08/millennials-not-leaving-the-nest-raises-alarms/432654/.
Week 12	April 17 th	<ul style="list-style-type: none"> • LEARNING TO FEED YOURSELF <ul style="list-style-type: none"> ➤ Hunting and Foraging on your Own ➤ The Effects of Resource Enriched vs. Resource Impoverished Environments <p><u>Required reading assignments</u></p> <ol style="list-style-type: none"> 1. <i>Wildhood</i>: Epilogue, pp. 263-267. 2. Urban Institute: http://apps.urban.org/features/food-insecurity/ 3. Houser, AnnMarie, Markus Gusset, Christy J Bragg, Lorraine K Boast and Michael J Somers. Pre-release hunting training and post-release monitoring are key components in the rehabilitation of orphaned large felids. <i>South African Journal of Wildlife Research</i> 2011. 41(1):11-20. 4. Animals balance threat of starvation with threat of predators

TERM WEEK	CLASS DATE	TOPICS and READINGS
		<p>to stay alive. October 2, 2012. Retrieved from https://phys.org/news/2012-10-animals-threat-starvation-predators-alive.html.</p> <p>5. Males, Mike. Age, Poverty, Homicide, and Gun Homicide: Is Young Age or Poverty Level the Key Issue? <i>SAGE Open</i> 2015:1-12.</p>
Week 13	April 24 th	TBD
Week 14	April 30 th	A take-home final exam will be distributed on Thursday, April 30 th at 11:00am via email and will be available on Canvas. It is due date by 11:00am on Monday, May 4 th via Canvas upload. Late submissions will receive a 10% deduction on your final exam per 24-hour period. More details about the final exam and its due date will be provided during class.