Instructor: Dr. Kris Sabbi (ksabbi@fas.harvard.edu)

Meeting Time: 9:00-10:15 T/Th **Location: Peabody 52H**

Learning Objectives:

- Describe key differences in human life history and how they evolved,
- Apply evolutionary concepts to explain modern human variation,
- Use available evidence to evaluate existing hypotheses and devise new ones,
- Gain research skills to design potential tests of your hypotheses,
- Communicate effectively about core concepts in this course

Course Overview:

Section 1: An Evolution Primer

In this section, we will lay the groundwork for the rest of the course, focusing on core concepts of evolutionary and life history theory.

Section 2: From Growing Up...

Our first puzzle starts right after birth: why do humans take so much longer to grow up than expected? In the second section of this course, we will explore competing hypotheses aimed at explaining this phenomenon.

Section 3: â€¦To Prime Time...

In juxtaposition to our long developmental periods, humans can reproduce much more quickly than our great ape cousins. How is that possible? How does human biology mix with cultural constructs to shape our reproductive patterns?

Section 4: â€¦And Into Old Age

Long life spans are unusual, but what really makes humans stand apart from other species is out-living our ability to reproduce. Most species continue reproducing until the end of their lives- why donâ€™t humans?

Required Readings:

This course will require two (2) textbooks: *How Humans Evolved* (9^{th} Edition) by Joan Silk and Robert Boyd,

and *The Evolution of Human Life History* eds. Hawkes and Paine.

Detailed Course Schedule: **(Last Updated on 31-Oct-23)**

Or download a PDF of the most recent Syllabus and Course Schedule here.

Please keep in mind that this syllabus is a living document. All assignments, subjects, readings, and due dates are subject to change throughout the semester. I will usually announce each change in class to keep us all on top of things, but please check the syllabus regularly for updates, especially regarding deadlines and readings.

Notes about readings*:* Silk and Boyd refers to your textbook â€œHow Humans Evolved,â€ whereas EHLH refers to your textbook â€œThe Evolution of Human Life History.â€ Each reference will be followed by the chapters to read for the particular class period. All other references refer to PDFs that I will upload to Canvas. PDFs will be uploaded at least one week prior to class and will be named starting with the week that they are required for (e.g. â€œWeek1_Reading) followed by the lead author of the reference. If a reading is missing please notify me ASAP.

Section 1: An Evolution Primer and Intro to Life History Theory

In this section, we will lay the groundwork for the rest of the course, focusing on core concepts of evolutionary and life history theory.

Section 1	Topic	Readings	Assignments
Week 1: Sep. 5	Welcome + Intro	Syllabus	
Week 1: Sep. 7	Evolutionary Concepts Part 1	Silk and Boyd Ch. 1-2	
Week 2: Sep. 12	Evolutionary Concepts Part 2	Silk and Boyd Ch. 3 Bergman and Beehner, 2022	
Week 2: Sep. 14	Concepts in Life History Part 1	Hill, 1993	
Week 3: Sep. 19	Concepts in Life History Part 2	Del Giudice, Gangstad, and Kaplan 2015	
Week 3: Sep. 21	Primate Patterns	Silk and Boyd Ch. 8 Jones, 2011, Curr. Bio. Powell et al., RSPB	**Assignment 1 Due**
Week 4: Sep. 26	Broad Patterns in Human Life History Part 1	EHLF Ch. 2, 3	
Week 4: Sep. 28	Broad Patterns in Human Life History Part 2		

Section 2: From Growing Up...

Our first puzzle starts right after birth: why do humans take so much longer to grow up than expected? In the second section of this course, we will explore competing hypotheses aimed at explaining this phenomenon.

Section 2	Topic	Readings	Assignments
Week 5: Tu. Oct. 3	Brain, Body, Behavior, and Development 1	Bogin, 2015 Thompson and Nelson, 2016 Smith 2013	**Mini-Exam 1**
Week 5: Th. Oct. 5	Brain, Body, Behavior, and Development, 2	Kuzawa et al., 2014 & Responses to Kuzawa et al.	
Week 6: Tu. Oct. 10	Flex Day		
Week 6: Th. Oct. 12	The Advent of Childhood		
Week 7: Tu. Oct. 17	The Evolution of Childhood	EHLF Ch. 7 Bernstein, 2016	
Week 7: Th. Oct. 19	Adolescent Transitions	Reiches, 2019 Sisk and Zehr, 2005	
Week 8: Tu. Oct. 24	Why do we take so long to grow up?	Joffe, 1997 Janson and van Schaik, 2002 Del Giudice et al, 2015 (repeated)	**Assignment 2 Due**
Week 8: Th. Oct. 26	**Mini-Exam 2**		

Section 3: â€¦To Prime Time

In juxtaposition to our long developmental periods, humans can reproduce much more quickly than our great ape cousins. How is that possible? How does human biology mix with cultural constructs to shape our reproductive patterns?

Section 3	Topic	Readings	Assignments
Week 9: Tu. Oct. 31	Mating and Reproductive Systems	Silk and Boyd Ch. 6 and Ch. 15 pp 409-421 Scelza, 2013 Simmons, 2005	
Week 9: Th. Nov. 2	Partner Choice Across Cultures	Dance with the Wodaabe	
Week 10: Tu. Nov 7	Gestation and Birthing	Ellison Ch. 2,3	
Week 10: Th. Nov 9	Motherhood	EHLH Ch. 6	
Week 11: Tu. Nov. 14	Fatherhood	Gettler et al. 2020 Seward & Stevens-Stevens, 2013 Journal Club: Boyette et al., 2020 Murray et al., 2016 Rosenbaum et al., 2015 Sarkadi et al., 2008	**Journal Club + Discussion**
Week 11: Th. Nov. 16	**Mini-Exam 3**		**Assignment 3 Due**

Section 4: â€¦Through the Other Side

Most species continue reproducing until the end of their lives- why donâ€™t humans?

Section 4	Topic	Readings	Assignments
Week 12: Tu. Nov. 21	Long Lifespans and Senescence	Borgerhoff Mulder, 1998 Jaeggi, et al., 2022	
Week 12: Th. Nov. 23	THANKSGIVING, NO CLASS		
Week 13: Tu. Nov. 28	Menopause	Hawkes and Coxworth, 2013 Lahdenpera et al., 2004	

		Monaghan et al., 2023	
Week 13: Th. Nov. 30	Grandmothers Across the Animal Kingdom	Grimes et al., 2023 Lahdenpera, et al., 2016 Natrass et al., 2019 Scelza and Hinde, 2019 Wood et al., 2023	**Journal Club for Section 4**
Week 14: Tu. Dec. 5	Choose Your Own Adventure		**Assignment 4 Due**

Detailed Grading and Course Policies:

Prepared Assignments:

There will be four (4) assignments due over the course of the semester- one for each session. Each student must complete at least three of the four assignments, including the final assignment due during the last full week of the course. Any student who completes all four assignments will have their lowest grade counted toward extra credit points. Each assignment will be posted to Canvas including a rubric for grading the assignment.

In Class Assignments:

While attendance is not explicitly required in this course, over the course of the semester there will be four graded in-class assignments that will be graded and will not be announced ahead of time. For the most part, these activities are designed to be fun and could include break-out discussions, in-class group readings, video activity sheets, etc. These activities may only be completed in class and may not be made up.

Quizzes:

Over the course of the semester, we will have three in-class quizzes scheduled during our meeting time. Each quiz will occur toward the end of a course section and focus on materials that we have learned during that section. In that way, quizzes are not necessarily cumulative, *however*, you should keep in mind that many of the concepts for each section cross over into the next so expect to apply ideas that you have learned previously during any quiz. Students must be in attendance to sit for exams except for in cases described in the Harvard Student Handbook (p. 37-43).

Final Exam:

The final exam will be cumulative and consist of several medium- and long-format questions. We will go over the format of the exam and some tips for studying in our final class session.

Extra Credit:

During the semester I will offer opportunities to earn extra credit that will be announced in detail as they come up. Everyone is welcome to participate and, together, all extra credit will be worth no more than 5% of your total grade.

Academic Integrity, Academic Dishonesty, and the

Harvard College Honor Code:

You will be expected to adhere to Harvardâ€™s official policies on academic integrity, academic dishonesty, and the college honor code as outlined in the Student Handbook (pg. 35-37).

â€œMembers of the Harvard College community commit themselves to producing academic work of integrity â€” that is, work that adheres to the scholarly and intellectual standards of accurate attribution of sources, appropriate collection and use of data, and transparent acknowledgment of the contribution of others to our ideas, discoveries, interpretations, and conclusions. Cheating on exams or problem sets, plagiarizing or misrepresenting the ideas or language of someone else as oneâ€™s own, falsifying data, or any other instance of academic dishonesty violate the standards of our community, as well as the standards of the wider world of learning and affairs.â€

Statement about Generative Artificial Intelligence:

Generative AI tools (e.g. Chat GPT) are an incredible new technology with the potential to unlock new frontiers across many facets of our lives. As an emerging technology, the capabilities of these tools are quickly changing rapidly and their use in education is burgeoning. However, we must also acknowledge the limitations of these tools as we learn to apply them. Therefore, **Generative AI tools (e.g. ChatGPT) may be used only when (and how) specified for any and all graded work for this course, and otherwise are not permitted.**

An excerpt from the University: â€œThe Harvard College Honor Code requires adherence to â€œaccurate attribution of sourcesâ€ and the â€œtransparent acknowledgement of the contribution of othersâ€ to â€œideas, discoveries, interpretations, and conclusions.â€ As such, all material included in assignment submissions must be properly attributed to sources (using quotations and citations as appropriate). Failure to attribute material to its original source constitutes plagiarism. Students should be aware that generative AI tools often generate incorrect statements, generate fake sources, and/or do not attribute material to proper sources. ***Students must acknowledge all instances in which generative AI tools were used in an assignment*** (such as in ideation, research, analysis, editing, debugging, etc.). *All* submitted work by a student must either be original work or properly attributed to external sources, as stated by the Harvard College Honor Code. Students are responsible for the entirety of their final submission; any inaccuracies or other deficiencies cannot be excused on the basis of originating from an AI tool.â€

Academic Accommodations:

As your instructor in this course, I will do my best to support your success. In line with the student handbook, students with visible and/or invisible disabilities are encouraged to reach out to the Harvard Disability Access Office (https://dao.fas.harvard.edu/) as early as possible to arrange any necessary accommodations.

Discrimination and Bullying:

From the student handbook:

â€œOn September 1, 2023, the University adopted new policies and procedures to address discrimination and bullying. These policies apply to all students, faculty, staff, researchers, and other members of the Harvard community across all Schools and units, including the FAS. More information about these policies can be found on the Provostâ€™s Office website (https://communitymisconductpolicies.harvard.edu/reports-and-draft-policies).

Discrimination based on race, color, sex, gender identity, sexual orientation, religion, creed, national origin, age, ancestry, veteran status, disability, military service, or any other legally protected basis is contrary to the principles and policies of Harvard University.

Discrimination on the Basis of Sex, Sexual Orientation, and Gender Identity:

Sexual harassment, including sexual violence, and other sexual misconduct are forms of sex discrimination. The Universityâ€™s policies and procedures concerning complaints of discrimination based on sex, sexual orientation, or gender identity can be found here: https://oge.harvard.edu/policies-procedures.

Formal complaints are submitted to the University Title IX Coordinator and investigated by the Office for Dispute Resolution (ODR). If a Harvard College student is found to have violated the policy, the Collegeâ€™s Administrative Board will consider appropriate sanctions. The Collegeâ€™s Title IX Resource Coordinators can answer questions about the process for filing a formal complaint, and speaking to a Title IX Resource Coordinator does not automatically trigger a formal complaint.

Discrimination on Other Bases:

Ordinarily, students should direct their initial inquiries regarding discrimination to their Resident Dean or to the Office of the Dean of Harvard College. Students can also report an incident of bias, harassment, and/or discrimination by emailing reportbias@fas.harvard.edu or by submitting an incident report via the anonymous bias report form (https://diversity.college.harvard.edu/report-bias).

Undergraduates who feel that they have been subjected to discrimination may wish first to seek a resolution of the problem with the assistance of their Resident Dean. These officers may consult with others in the College and the FAS, including, for example, the Office of the Dean of Harvard College, or the Director of the Disability Access Office, depending on the nature of the concern.

If the matter cannot be resolved satisfactorily by informal methods, more formal routes are available. The student may lodge a complaint with the Office of the Dean of Harvard College. Depending on the circumstances, and in consultation with the student making the complaint, that officer may request that the Dean of Harvard College appoint a special committee to resolve the problem or may refer it to the appropriate agency or office of Harvard College or of the FAS for resolution. Such agencies include, among others, the Administrative Board, the Faculty Council, and the Dean of the FAS.

If the matter cannot be resolved satisfactorily through ordinary channels, either the student or the Dean of Harvard College may refer it to the Dean of the Faculty for final resolution. The Dean of the Faculty holds authority over all departments, committees, commissions, and councils within the FAS. The decision of the Dean of the Faculty will be final.â€

Appendix A: List of additional readings (APA format)

Each listed PDF can be found in with its associated module/section in Canvas.

Section 1:

Bergman, T. J., & Beehner, J. C. (2022). Leveling with Tinbergen: Four levels simplified to causes and consequences. *Evolutionary Anthropology: Issues, News, and Reviews*, *31*(1), 12-19.

Del Giudice, Kaplan, H. S., & Gangestad, S. W. (2015). Life history theory and evolutionary psychology. *The handbook of evolutionary psychology*, 68-95.

Hill, K. (1993). Life history theory and evolutionary anthropology. *Evolutionary Anthropology: Issues, News, and Reviews*, *2*(3), 78-88.

Jones, J. H. (2011). Primates and the evolution of long, slow life histories. *Current Biology*, *21*(18), R708-R717.

Powell, L. E., Barton, R. A., & Street, S. E. (2019). Maternal investment, life histories and the evolution of brain structure in primates. *Proceedings of the Royal Society B*, *286*(1911), 20191608.

Section 2:

Bernstein, R. (2016). Hormones and the evolution of childhood in human and nonhuman primates. *Childhood: Origins, evolution, and implications*, 103-119. (Book chapter available through HOLLIS)

Bogin, B. (2015). Human growth and development. In *Basics in human evolution* (pp. 285-293). Academic Press.

Del Giudice, Kaplan, H. S., & Gangestad, S. W. (2015). Life history theory and evolutionary psychology. *The handbook of evolutionary psychology*, 68-95. (repeat)

Joffe, T. H. (1997). Social pressures have selected for an extended juvenile period in primates. *Journal of human evolution*, *32*(6), 593-605.

Kuzawa, C. W., Chugani, H. T., Grossman, L. I., Lipovich, L., Muzik, O., Hof, P. R., ... & Lange, N. (2014). Metabolic costs and evolutionary implications of human brain development. *Proceedings of the National Academy of Sciences*, *111*(36), 13010-13015.

Responses:

Skoyles, J. R. (2014). Skeletal muscle-induced hypoglycemia risk, not life history energy trade-off, links high child brain glucose use to slow body growth. *Proceedings of the National Academy of Sciences*, *111*(46), E4909-E4909.

Kuzawa, C. W., Chugani, H. T., Grossman, L. I., Lipovich, L., Muzik, O., Hof, P. R., ... & Lange, N. (2014). Reply to Skoyles: Decline in growth rate, not muscle mass, predicts the human childhood peak in brain metabolism. *Proceedings of the National Academy of Sciences*, *111*(46), E4910-E4910.

Pereira, M. E., & Fairbanks, L. A. (Eds.). (2002). *Juvenile primates: life history, development and behavior, with a new foreword*. University of Chicago Press.

Reiches, M. W. (2019). Adolescence as a biocultural life history transition. *Annual Review of Anthropology*, *48*, 151-168.

Sisk, C. L., & Zehr, J. L. (2005). Pubertal hormones organize the adolescent brain and behavior. *Frontiers in neuroendocrinology*, *26*(3-4), 163-174.

Smith, T. M. (2013). Teeth and human life-history evolution. *Annual Review of Anthropology*, *42*, 191-208.

Section 3:

Boyette, A. H., Lewâ€Levy, S., Sarma, M. S., Valchy, M., & Gettler, L. T. (2020). Fatherhood, egalitarianism, and child health in two smallâ€scale societies in the Republic of the Congo. *American Journal of Human Biology*, *32*(4), e23342.

Ellison, P. T. (2003). *On fertile ground: A natural history of human reproduction*. Harvard University Press.

Gettler, L. T. (2020). Exploring evolutionary perspectives on human fatherhood and paternal biology: Testosterone as an exemplar. *Handbook of Fathers and Child Development: Prenatal to Preschool*, 137-152.

Murray, C. M., Stanton, M. A., Lonsdorf, E. V., Wroblewski, E. E., & Pusey, A. E. (2016). Chimpanzee fathers bias their behaviour towards their offspring. *Royal Society Open Science*, *3*(11), 160441.

Rosenbaum, S., Hirwa, J. P., Silk, J. B., Vigilant, L., & Stoinski, T. S. (2015). Male rank, not paternity, predicts maleâ€“immature relationships in mountain gorillas, *Gorilla beringei beringei*. *Animal Behaviour*, *104*, 13-24.

Sarkadi, A., Kristiansson, R., Oberklaid, F., & Bremberg, S. (2008). Fathers' involvement and children's developmental outcomes: a systematic review of longitudinal studies. *Acta paediatrica*, *97*(2), 153-158.

Scelza, B. A. (2013). Choosy but not chaste: Multiple mating in human females. *Evolutionary Anthropology: Issues, News, and Reviews*, *22*(5), 259-269.

Seward, R. R., & Stanley-Stevens, L. (2013). Fathers, fathering, and fatherhood across cultures. *Parenting across cultures: Childrearing, motherhood and fatherhood in non-Western cultures*, 459-474.

Simmons, L. W. (2005). The evolution of polyandry: sperm competition, sperm selection, and offspring viability. *Annu. Rev. Ecol. Evol. Syst.*, *36*, 125-146.

Section 4:

Grimes, C., Brent, L. J., Ellis, S., Weiss, M. N., Franks, D. W., Ellifrit, D. K., & Croft, D. P. (2023). Postreproductive female killer whales reduce socially inflicted injuries in their male offspring. *Current Biology*, *33*(15), 3250-3256.

Hawkes, K., & Coxworth, J. E. (2013). Grandmothers and the evolution of human longevity: a review of findings and future directions. *Evolutionary Anthropology: Issues, News, and Reviews*, *22*(6), 294-302.

Jaeggi, A. V., Martin, J. S., Floris, J., Bender, N., Haeusler, M., Sear, R., & Staub, K. (2022). Life-history tradeoffs in a historical population (1896â€“1939) undergoing rapid fertility decline: Costs of reproduction? *Evolutionary human sciences*, *4*, e7.

LahdenperÃ¤, M., Lummaa, V., Helle, S., Tremblay, M., & Russell, A. F. (2004). Fitness benefits of prolonged post-reproductive lifespan in women. *Nature*, *428*(6979), 178-181.

LahdenperÃ¤, M., Mar, K. U., & Lummaa, V. (2016). Nearby grandmother enhances calf survival and reproduction in Asian elephants. *Scientific reports*, *6*(1), 27213.

Monaghan, P., & Ivimeyâ€Cook, E. R. (2023). No time to die: Evolution of a postâ€reproductive life stage. *Journal of Zoology*.

Mulder, M. B. (1998). The demographic transition: are we any closer to an evolutionary explanation?. *Trends in ecology & evolution*, *13*(7), 266-270.

Nattrass, S., Croft, D. P., Ellis, S., Cant, M. A., Weiss, M. N., Wright, B. M., ... & Franks, D. W. (2019). Postreproductive killer whale grandmothers improve the survival of their grandoffspring. *Proceedings of the National Academy of Sciences*, *116*(52), 26669-26673.

Scelza, B. A., & Hinde, K. (2019). Crucial contributions: a biocultural study of grandmothering during the perinatal period. *Human Nature*, *30*(4), 371-397.