

Modul 31-BIO-216

Human Behavior, Ecology, and Culture - Menschliches Verhalten, Ökologie und Kultur

Universität Leipzig, Winter semester 2022/2023

Instructors

Dr. Elspeth Ready (lectures and discussion seminars, elspeth_ready@eva.mpg.de)

Dr. Richard McElreath (practical seminars, richard_mcelreath@eva.mpg.de)

Times

Lectures and discussion seminars: Monday and Friday 9am–10:15am

Practical seminars: TBA

Overview

This module consists of **6 weeks of introductory lectures and discussions** and **5 weeks of practical seminars**.

The focus of this course is to present evidence for human behavioral diversity, acquaint students with ecological and evolutionary theories of human behaviour, and introduce toolkits used for testing these theoretical ideas. By understanding how and why humans make particular decisions regarding their economic, social, and reproductive success, we can better understand both our evolutionary history and contemporary issues such as fertility transitions and resource degradation.

The lectures and discussion seminars will explore the scientific study of the role of human behavior and culture in both the evolution of our species and the dynamics of human societies. Humans are geographically widespread, physiologically rather all the same, but behaviorally highly diverse. Why is our species so widespread and so numerous? How are we influenced by our environment? How does culture evolve?

The practical seminars on Statistical Rethinking are designed to teach students how to construct and test models to explain observed phenomena. This part of the course focuses on how to make inferences from data. Reflecting the need for scripting in today's model-based statistics, students will implement analyses using R or another programming language. This unique computational approach helps students to develop sufficient understanding of modelling approaches to make reasonable choices and interpretations in their own work.

Materials

There will be readings to accompany each lecture, discussion, or practical seminar. These will be distributed electronically.

Assessment

For the introductory part, each student will give a short presentation, participate in the discussions, and write an essay. For the presentation, students will choose from a list of articles that relate to the topics presented in the different weeks (list distributed via email and here). During the discussion seminar for the week of that topic, students will give a 10-minute presentation summarizing their assigned article. For the essay, students will write a (minimum) 2-page summary of one of the discussion seminars, focusing on the theoretical ideas presented in the papers and the evidence for/against these ideas. This summary should be based on the presentations for a week in which you are not presenting.

For the practical part of the course, students will submit weekly homework assignments.

There will be no final exam. Grades will be assigned based on the presentation, essay, and submission of homework.

Course meetings

First session. The first session (Friday, 21 October, 9h00) will be held in the main lecture hall at the Max Planck Institute for Evolutionary Anthropology (Deutscher Platz 6). This session will introduce the course, explain the format and expectations, and be a chance for everyone to get to know the other participants. The session will be recorded for students unable to attend in person.

Lectures. From 24 October to 16 December inclusive, there will be a lecture each Monday from 9h00–10h15, with the exception of the week of Oct 31. Lectures will be held in the main lecture hall at MPI-EVA, room H.210. Lectures will be posted online for students unable to attend in person. There are required readings for each lecture that students should read before that weeks' discussion seminar.

Discussion seminars. From 24 October to 16 December inclusive, there will be a discussion seminar each Friday from 9h00-10h15, with the exception of the week of Oct 31. Discussion seminars will be held online using Zoom: link & access code will be shared with students via email. Contact Dr. Ready if you have not received the link.

The discussion seminars will consist of 3–4 presentations from students, each about 10 minutes, followed by 45 minutes of general discussion on an important area of research. During the six weeks of the lectures and discussion seminars, each student will give one presentation on a scientific article that relates to the topic of the respective week, selected from the list provided below. During the live sessions, you are welcome to turn on your video, but it is not expected unless you are presenting. Keep your microphone muted until you are contributing to a discussion.

The list of articles for presentations during the discussion seminars is appended at the end of the syllabus. **By the end of Friday October 21 please email Dr. Ready your top three choices of articles to present during the discussion seminars** (each student will present only one article). Presentation assignments will be announced by email on Monday Oct 24.

Practical seminars. Following the holiday break, students will participate in the first five weeks of the course Statistical Rethinking with Dr. McElreath. For this portion of the course, there will be two one-hour lectures per week, which students will watch online, along with accompanying chapters from the course textbook (McElreath 2020), which will be made available online. There will be weekly homework which students should submit to richard_mcelreath@eva.mpg.de. Solutions to the homework problems will be worked through in live-coding sessions, schedule TBA.

Course schedule

Week 0		
Friday, October 21	Introductory lecture (MPI/online)	Reading: Smith and Winterhalder 1992; Winterhalder and Smith 1992 Submit choice of 3 options for presentations to elspeth_ready@eva.mpg.de
Week 1		
Monday, Oct 24	Lecture: Subsistence (MPI/online)	Reading: Cashdan 1992; Koster and Bird 2023
Friday, Oct 28	Discussion: Risk and human livelihood strategies (online)	Articles for discussion: Mace 1993; Winterhalder et al. 1999; Tucker et al. 2010; Marean 2016

Monday, Oct 31: Holiday, no class this week		
Week 2		
Monday, Nov 7	Lecture: Cooperation and conflict (MPI/online)	Reading: Boyd and Richerson 2009; Alvard and Nolin 2023
Friday, Nov 11	Discussion: Food sharing – why work for others? (online)	Articles for discussion: Winterhalder 1996; Gurven 2006; Wiessner 2006; Ready and Power 2018
Week 3		
Monday, Nov 14	Lecture: Human Life History (Guest lecturer Ilaria Pretelli, MPI/online)	Reading: Kaplan et al. 2000; Jones 2011
Friday, Nov 18	Discussion: Evolution of childhood (online)	Articles for discussion: Bliege Bird and Bird 2002; Schuppli et al. 2016; González-Forero and Gardner 2018; Koster et al. 2020
Week 4		
Monday, Nov 21	Lecture: Cultural evolution and social learning (Guest lecturer Niccolò Porras Alvarez, MPI/online)	Reading: Panchanathan 2023; Henrich McElreath 2003
Friday, Nov 25	Discussion: Population and innovation (online)	Articles for discussion: Henrich 2004; Klein and Boyd 2010; Baldini 2015; Fay et al. 2019; Deffner et al. 2022
Week 5		
Monday, Dec 5	Lecture: Kinship and reproduction (Guest lecturer Arianna Dalzero, MPI/online)	Reading: Dousset 2011; Ross et al. 2018
Friday, Dec 9	Discussion: Fertility transitions – why have fewer children? (online)	Articles for discussion: Kirk 1996; Sear and Coall 2011; Ross et al. 2016; Collieran 2016
Week 6		
Monday, Dec 12	Lecture: Niche construction, intensification and the long durée (Guest lecturer Natalia Fedorova, MPI/online)	Reading: Zeder 2012; Laland et al. 2016
Friday, Dec 16	Discussion: Intensification, now and then (online)	Articles for discussion: Boserup 1976; Kennett et al. 2009; Rasmussen et al. 2018; Ortman et al. 2015; Larsen et al. 2019
ESSAY DEADLINE		
Wednesday, Dec 21	Last day of classes before break, essay assignment due	Email essays to elspeth_ready@eva.mpg.de
HOLIDAY BREAK		
Week 7		
	Statistical Rethinking Lectures: 1 (Golem of Prague) & 2 (Garden of Forking Data)	Reading: McElreath 2020, Chaps. 1–3 Homework: HW1
Week 8		
	Statistical Rethinking Lectures:	Reading: McElreath 2020, Chap. 4 Homework: HW2

	3 (Geocentric Models) & 4 (Wiggly Orbits)	
Week 9		
	Statistical Rethinking Lectures: 5 (Spurious Waffles) & 6 (Haunted DAG)	Reading: McElreath 2020, Chaps 5 & 6 Homework: HW3
Week 10		
	Statistical Rethinking Lectures: 7 (Ulysses' Compass) & 8 (Model Comparison)	Reading: McElreath 2020, Chap. 7 Homework: HW4
Week 11		
	Statistical Rethinking Lectures: 9 (Conditional Manatees) & 10 (Markov Chain Monte Carlo)	Reading: McElreath 2020, Chap. 8 & 9 Homework: HW5

Required readings

Alvard, M. and Nolin, D. (2023 [forthcoming]). Cooperation. In: Koster, J., Scelza, B., and Shenk, M. (Eds.), *Human Behavioral Ecology*.

Boyd, R., and Richerson, P. J. (2009). Culture and the evolution of human cooperation. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1533): 3281–3288.

Cashdan, E. (1992). Spatial organization and habitat use. In Smith, E.A. and Winterhalder, B., (Eds.), *Evolutionary ecology and human behavior*, pp. 237–267. Transaction Publishers, New Brunswick, NJ.

Dousset, L. (2011). Understanding Human Relations (Kinship Systems). In: Thieberger, N. (Ed.), *The Oxford handbook of linguistic fieldwork*, pp. 209–234. Oxford: Oxford University Press.

Henrich, J., & McElreath, R. (2003). The evolution of cultural evolution. *Evolutionary Anthropology*, 12(3): 123–135.

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

Kaplan, H., Hill, K., Lancaster, J., and Hurtado, A. M. (2000). A theory of human life history evolution: Diet, intelligence, and longevity. *Evolutionary Anthropology*, 9(4): 156–185.

Koster, J., and Bird, D.W. (2023 [forthcoming]). Foraging Strategies. In: Koster, J., Scelza, B., and Shenk, M. (Eds.), *Human Behavioral Ecology*.

Laland, K., Matthews, B., & Feldman, M. W. (2016). An introduction to niche construction theory. *Evolutionary Ecology*, 30(2): 191–202.

McElreath, R. (2020). *Statistical rethinking: A Bayesian course with examples in R and Stan*. Chapman and Hall/CRC. (Chapters 1–9).

Panchanathan, K. (2023 [forthcoming]). Cultural Evolution. In: Koster, J., Scelza, B., and Shenk, M. (Eds.), *Human Behavioral Ecology*.

Ross, C.T. et al. (2018). Greater wealth inequality, less polygyny: Rethinking the polygyny threshold model. *Journal of the Royal Society Interface*, 15: 20180035.

Smith, E.A. and Winterhalder, B. (1992). Natural selection and decision-making: Some fundamental principles. In: Smith, E.A. and Winterhalder, B., (Eds.), *Evolutionary ecology and human behavior*, pp. 25–60. Transaction Publishers: New Brunswick, NJ.

Winterhalder, B. and Smith, E.A. (1992). Evolutionary ecology and the social sciences. In: Smith, E.A. and Winterhalder, B., (Eds.), *Evolutionary ecology and human behavior*, pp.1–24. Transaction Publishers: New Brunswick, NJ.

Zeder, M. A. (2012). The Broad Spectrum Revolution at 40: Resource diversity, intensification, and an alternative to optimal foraging explanations. *Journal of Anthropological Archaeology*, 31(3): 241–264.

Articles for discussion seminars

Week 1. Risk and human adaptation.

- 1) Mace, R. (1993). Nomadic pastoralists adopt subsistence strategies that maximize long-term household survival. *Behavioral Ecology and Sociobiology*, 33: 329–334.
- 2) Winterhalder, B., Lu, F., and Tucker, B. (1999). Risk-sensitive adaptive tactics: Models and evidence from subsistence studies in biology and anthropology. *Journal of Archaeological Research*, 7: 301–348.
- 3) Tucker, B., Tsimitamby, Humber, F., Benbow, S., and Iida, T. (2010). Foraging for development: A comparison of food insecurity, production, and risk among farmers, forest foragers, and marine foragers in southwestern Madagascar. *Human Organization*, 69: 375–386.
- 4) Marean, C. W. (2016). The transition to foraging for dense and predictable resources and its impact on the evolution of modern humans. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1698): 20150239.

Week 2. Food sharing.

- 5) Winterhalder, B. (1996). A marginal model of tolerated theft. *Ethology and Sociobiology*, 17(1): 37–53.
- 6) Wiessner, P. (2002). Hunting, healing, and hxaro exchange: A long-term perspective on! Kung (Ju/'hoansi) large-game hunting. *Evolution and Human Behavior*, 23(6): 407–436.
- 7) Gurven, M. (2006). The evolution of contingent cooperation. *Current Anthropology*, 47(1): 185–192.
- 8) Ready, E. and Power, E. (2018). Why wage-earners hunt: Food sharing, social structure, and influence in an Arctic mixed economy. *Current Anthropology*, 59(1):74–97.

Week 3. Evolution of childhood.

- 9) Bliege Bird, R., and Bird, D.W. (2002). Constraints of knowing or constraints of growing? *Human Nature*, 13(2): 239–267.
- 10) Schuppli, C., Graber, S. M., Isler, K., and van Schaik, C. P. (2016). Life history, cognition and the evolution of complex foraging niches. *Journal of Human Evolution*, 92: 91–100.
- 11) González-Forero, M., and Gardner, A. (2018). Inference of ecological and social drivers of human brain-size evolution. *Nature*, 557: 554–557.
- 12) Koster, J., McElreath, R., et al. (2020). The life history of human foraging. *Science Advances*, 6: eaax9070.

Week 4. Population size.

- 13) Henrich, J. (2004). Demography and cultural evolution: How adaptive cultural processes can produce maladaptive losses—the Tasmanian case. *American Antiquity*, 69(2): 197–214.
- 14) Kline, Michelle A., and Robert Boyd. (2010). Population size predicts technological complexity in Oceania" *Proceedings of the Royal Society B: Biological Sciences*, 277(1693): 2559–2564.
- 15) Baldini, R. (2015). Revisiting the effect of population size on cumulative cultural evolution. *Journal of Cognition and Culture*, 15(3–4): 320–336.
- 16) Fay, N., De Kleine, N., Walker, B. and Caldwell, C.A. (2019) Increasing population size can inhibit cumulative cultural evolution. *Proceedings of the National Academy of Sciences*, 116(14): 6726–6731.
- 17) Deffner, D., Kandler, A., and Fogarty, L. (2022). Effective population size for culturally evolving traits. *PLOS Computational Biology*, 18(4): e1009430.

Week 5. Fertility transitions.

- 18) Kirk, D. (1996). Demographic transition theory. *Population Studies*, 50(3): 361–387.
- 19) Sear, R., and Coall, D. (2011). How much does family matter? Cooperative breeding and the demographic transition. *Population and Development Review*, 37: 81–112.
- 20) Ross, C. T., Mulder, M. B., Winterhalder, B., Uehara, R., Headland, J., and Headland, T. (2016). Evidence for quantity–quality trade-offs, sex-specific parental investment, and variance compensation in colonized Agta foragers undergoing demographic transition. *Evolution and Human Behavior*, 37(5): 350–365.
- 21) Colleran, H. (2016). The cultural evolution of fertility decline. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1692): 20150152.

Week 6. Intensification.

- 22) Boserup, E. (1976). Environment, population, and technology in primitive societies. *Population and Development Review*, 2(1): 21–36.
- 23) Kennett, D. J., Winterhalder, B., Bartruff, J., and Erlandson, J. M. (2009). An ecological model for the emergence of institutionalized social hierarchies on California's Northern Channel Islands. In Shennan, S., (Ed.), *Pattern and process in cultural evolution*, pp. 297–314. University of California Press, Berkeley.
- 24) Ortman, S. G., Cabaniss, A. H. F., Sturm, J. O., & Bettencourt, L. M. A. (2015). Settlement scaling and increasing returns in an ancient society, (February).
- 25) Rasmussen, L. V., Coolsaet, B., et al. (2018). Social-ecological outcomes of agricultural intensification. *Nature Sustainability*, 1(6): 275–282.
- 26) Larsen, C. S., Knüsel, C. J., et al. (2019). Bioarchaeology of Neolithic Çatalhöyük reveals fundamental transitions in health, mobility, and lifestyle in early farmers. *Proceedings of the National Academy of Sciences*, 116(26): 12615–12623.