

Evolutionary Theory in the Anthropological Sciences

Winter 2008

Instructor Information

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Office Hours: by appointment

Meeting Time and Location:

Fridays, 12-3 pm, Building 50, Room 52T

Course Description

In this course we will discuss aspects of the theory of evolution of particular relevance to the human sciences. While exceptionally powerful as an explanatory model, evolutionary theory is all too frequently poorly applied to problems of human behavior and the diversity of the human phenotype. The goal of this class is to provide a critical introduction to the aspects of contemporary evolutionary theory that are most likely to yield important insights into human evolution and behavior. Among these are quantitative genetics, formal optimality models, game theoretic approaches to social interactions, and niche construction models for cultural evolution. All of these approaches are built around a formalism that is largely absent in the contemporary study of anthropology. This class will attempt to address this critical omission in current anthropological training.

One historical question that we will deal with extensively is that of sociobiology and its intellectual legacy in anthropology, particularly the development of evolutionary psychology.

Assignments

Starting in the second week, students will turn in short written assignments synthesizing the important issues of the week. These assignments will be *no more than 1000 words* and are meant to be concise summaries of the issues dealt with that week and the ways the readings address them.

Evolutionary theory, like most scientific theory, is couched in a formalism grounded in the language of mathematics. One goal of the writing in this class is to develop skills at writing about formalism. This is a very distinct skill from doing the mathematics and is essential for effective scholarly communication and the advancement of the science.

Students are also expected to do in-class presentations on a rotating basis. For weeks in which you are assigned to present to class, you are expected to do at least one reading in addition to the readings assigned for the class. You can then use your enhanced understanding of the week's material to elucidate the questions, controversies, and methodologies particular to that week.

There will be no class on 24 January,

Students are expected to write a synthetic 20 page research paper on a topic of their choosing. The due date for the paper is **Friday, 21 March at 5:00 pm**. Please follow the style for scientific papers presented in my online guide available at:

<http://www.stanford.edu/~jhj1/Jones-PaperStyleGuide2008.pdf>

Grading

Grading will be based on a weighted combination of class participation, weekly writing assignments, and the term paper. There are three key components to class participation: (1) coming to class having done the reading and prepared to discuss, (2) discussing the reading in a frank, honest, professional way, (3) giving class presentations based on the material for the week. The breakdown for grading is as follows:

Class participation:	20%
Weekly writing assignments:	20%
Term paper:	60%

Syllabus

(Readings Subject to Change)

Fitness and Adaptation (11 January)

- Mills, S.K. and J. H. Beatty. 2006. The Propensity Interpretation of Fitness. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 3-24. Cambridge: MIT Press.
- Sober, E. 2006. The Two Faces of Fitness. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 25-40. Cambridge: MIT Press.
- Gould, S.J. and R.C. Lewontin. 2006. The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 79-98. Cambridge: MIT Press.

Determinism, Biological Causation, Ontogeny, and Interactions (18 January)

- Tinbergen, N. 1963. On the aims and methods of ethology. *Zeitschrift für Tierpsychologie* 20:410-433.
- Feldman, M. W., and R. C. Lewontin. 1975. The heritability hang-up. *Science* 190:1163-1168.
- Hinde, R. A. 1991. A Biologist Looks at Anthropology. *Man* 26 (4):583-608.

Optional:

- West-Eberhard, M. 1989. Phenotypic plasticity and the origins of diversity. *Annual Review of Ecology and Systematics*. 20:249-278.

24 January: NO CLASS

Evolution of Quantitative Traits (31 January)

- Lande, R. A. 1979. Quantitative genetic analysis of multivariate evolution applied to brain: body size evolution. *Evolution*. 33:402-416.
- Rogers, A. R., and A. Mukherjee. 1992. Quantitative Genetics of Sexual Dimorphism in Human Body Size. *Evolution* 46 (1):226-234.
- Mead, L.S. And S.J. Arnold. 2004. Quantitative genetic models of sexual selection. *Trends in Ecology and Evolution*. 19(5): 264-271.

Optional:

- Pettay, J. E., L. E. B. Kruuk, J. Jokela, and V. Lummaa. 2005. Heritability and genetic constraints of life-history trait evolution in preindustrial humans. *Proceedings of the National Academy of Sciences, USA*. 102 (8):2838-2843.

Sociobiology and Evolutionary Psychology (7-14 February)

Week 1:

- Symons, D. 1989. A Critique of Darwinian Anthropology. *Ethology and Sociobiology* 10 (1-3):131-144.
- Tooby, J., and L. Cosmides. 1990. The Past Explains the Present - Emotional Adaptations and the Structure of Ancestral Environments. *Ethology and Sociobiology* 11 (4-5):375-424.
- Betzig, L. 1989. Rethinking Human Ethology: A Response to Some Recent Critiques. *Ethology and Sociobiology* 10 (5):315-324.
- Turke, PW. 1990. Which humans behave adaptively, and why does it matter? *Ethology and Sociobiology* 11 (4-5):305-339.

Optional:

- Tooby, J., and L. Cosmides. 1989. Evolutionary Psychology and the Generation of Culture .1. Theoretical Considerations. *Ethology and Sociobiology* 10 (1-3):29-49.
- Tooby, J. And L. Cosmides. 2006. Toward Mapping the Evolved Functional Organization of the Mind and Brain. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 175-196. Cambridge: MIT Press.

Week 2:

- Daly, M. and M. Wilson (1999) Human Evolutionary Psychology and Animal Behaviour. *Animal Behavior* 57:509-519.
- Smith, E.A., M. Borgerhoff Mulder and K. Hill (2000) Evolutionary Analyses of Human Behavior: A Commentary on Daly and Wilson. *Animal Behavior* 60:F21-F26.
- Buller, D. J. 2006. Evolutionary psychology: A critique. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 197-216. Cambridge: MIT Press.

Optional:

- Foley, R. 1996. The Adaptive legacy of Human Evolution: A Search for the Environment of Evolutionary Adaptedness. *Evolutionary Anthropology*. 4:194-203.
- Lloyd, E. A. 1999. Evolutionary psychology: The burdens of proof. *Biology & Philosophy* 14 (2):211-233.
- Lloyd, E. A., and M. W. Feldman. 2002. Evolutionary psychology: A view from evolutionary biology. *Psychological Inquiry* 13 (2):150-156.

Altruism, Levels of Selection (21 February)

- Frank, S.A. 1995. George Price's Contributions to Evolutionary Genetics. *Journal of Theoretical Biology*. 175: 373-388.
- Bowles, S. 2006. Group competition, reproductive leveling, and the evolution of human altruism. *Science* 314 (5805):1569-1572.
- Wilson, D.S. 2006. Levels of Selection: An Alternative to Individualism in Biology and the Human Sciences. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 63-78. Cambridge: MIT Press.

Optional:

- Price, G.R. 1995. The Nature of Selection. *Journal of Theoretical Biology*. 175: 389-396.
- Gould, S. J., and E. A. Lloyd. 1999. Individuality and adaptation across levels of selection: How shall we name and generalize the unit of Darwinism? *Proceedings of the National Academy of Sciences, USA*. 96 (21):11904-11909.

Cultural Evolution and Niche Construction (28 February)

- Fracchia, J. and R. C. Lewontin. 2006. Does Culture Evolve? In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 505-534. Cambridge: MIT Press.

- Sober, E. 2006. Models of Cultural Evolution. In Sober, E., *Conceptual Issues in Evolutionary Biology*, 3rd Edition, pp. 535-554. Cambridge: MIT Press.
- McElreath, R. 2001. Reputation and the Evolution of Conflict. *Journal of Theoretical Biology*. 220, 345–357
- Day, R.L., K. N. Laland, and F.J. Odling-Smee. 2003. Rethinking adaptation: The niche construction perspective. *Perspectives in Biology and Medicine*. 46(1): 80-95.

Optional:

- Smith, B. D. 2007. Niche construction and the Behavioral context of plant and animal domestication. *Evolutionary Anthropology*. 16 (5):188-199.
- Odling-Smee, F.J., K. N. Laland, and M. W. Feldman. 2003. *Niche Construction: The Neglected Process in Evolution*. Vol. 37, *Monographs in Population Biology*. Princeton: Princeton University Press.

A Case Study in Cultural or Biological Evolution? (6-13 March)

- Clark, G. 2007. *A Farewell to Alms: A Brief Economic History of the World*. Princeton: Princeton University Press.

Supplementary Readings to Follow.