Anthropology 31: Evolutionary Ecology and Human Health

James Holland Jones
Department of Anthropology
Building 50, Office 52S
Email: jhj1@stanford.edu

Office Hours: by appointment

Meeting Time and Location: Tuesday/Thursday 10-11:50, *Wallenberg Hall (Bldg. 160), Room 124*

Course Description

This course examines human adaptation and plasticity (i.e., the ability of an individual with a given genotype to change its phenotype), human environments, and their relationship to health and well-being. We treat the term "environment" in the broadest sense to include not just the physical and biotic but the social and psychological as well. Topics covered include the evolution of plasticity and reaction norms, the physiology of stress and the inflammatory response, demography, reproductive decision-making, urbanization, migration, infectious disease, social capital and social networks, nutrition, nutritional deficiencies, growth, metabolic syndrome, social inequalities. No prior coursework in ecological or medical anthropology is required.

Readings

There are four required texts for the class. In addition, there will be a number of readings from the primary scientific literature made available on the class web site. The texts for the class include:

Moran, E.F. (2007) *Human Adaptability: An Introduction to Ecological Anthropology*, 3rd edition. Boulder, CO: Westview Press. (HAEA)

Nesse, R.M. and G.C. Williams. (1996) *Why We Get Sick*. New York: Vintage.

Ridley, M. (2004) *The Agile Gene: How Nature Turns on Nurture*. New York: Harper Perennial.

Stinson, S. B. Bogin, R. Huss-Ashmore, D. O'Rourke. (2000) *Human Biology: An Evolutionary and Biocultural Perspective*. New York: Wiley. (HBEBP)

Specific chapters from the Nesse & Williams book are required for particular weeks but it would probably make more sense to read the book straight through. Both Nesse & Williams and Ridley are popular science books that, while loaded with good information, are very quick reads.

We will read a few papers from the primary scientific literature. These papers will be made available on the course website: http://anthro31.stanford.edu.

Grading

Grading will be based on a a weighted combination of short assignments, a midterm exam, a brief written assignment, and a final exam. All assignments are due at the beginning of class on Thursday unless otherwise specified in the syllabus.

Approximately every other week, you will write a brief (1000 word) summary essay on a topic related to the reading to date. For these, you will be expected to incorporate the general theoretical ideas and themes covered to that point in the course and discuss their relationship to the topic at hand. You will receive the specific assignment the week prior to the due date.

Students taking the class for five credits will write a short written assignment (5 pages) providing your own analysis of some contemporary health recommendation or proscription (e.g., a reduction diet, an exercise regime, behavioral or lifestyle treatment for a chronic disease) within the evolutionary framework of the class.

Late work will received a one-third grade reduction each day that it is late.

The breakdown of grading is as follows for five credits:

Short Assignments:	20%
Written Assignment:	30%
Midterm Exam:	20%
Final Exam:	30%

The breakdown of grading is as follows for three credits:

Short Assignments:	30%
Midterm Exam:	30%
Final Exam:	40%

Expectations

Attendance at lecture is mandatory. Information discussed primarily in lecture will make its way onto exams, so it is in your best interest to attend and be engaged with all lectures.

Schedule

Week 1 (30 March-1 April). Introduction to Human Evolutionary Ecology

Approaches to Human Behavioral Biology (HBE, Evolutionary Psychology, Dual Inheritance, etc.), Biological Causation, Tinbergen's Causes, Genotype, Phenotype, Environmental Interactions, Reaction Norms, Plasticity, Trade-Offs, Phenotypic Gambit, Evolutionary Disequilibrium, Typology vs. Adaptation

Reading: Ridley (all), WWGS 1-4

Week 2 (6-8 April). Population History of the Human Organism

Population history, population regulation, Subsistence, Settlement, Malthus vs. Boserup

Reading: Ellison & O'Rourke (HBEBP, Ch. 15), HAEA Ch 1-4
Assignment: Nature Via Nurture

Week 3 (13-15 April). Mortality
(Thursday Guest Lecture)

Anatomy of the Human Mortality Curve, Life Tables, Measures of Mortality, Heterogeneity and Frailty, Mortality Cross-Overs, Inequality, Major Causes

Reading: Gage (HBEBP, Ch. 14), Harper & Crews (HBEBP, Ch. 13), WWGS Chs. 5, 8

Week 4 (20-22 April). Infectious Disease
(Tuesday Guest Lecture)

Disease Ecology, Types of Infectious Disease, Infection Dynamics, Control and Eradication

Reading: Sattenspiel (HBEBP, Ch. 7), Jackson (HBEBP, Ch. 8)
Assignment: Why Do We Get Sick?

Week 5 (27-29 April). Fertility and Reproductive Decisions

Measures of Fertility, Historical Trends, Tempo and Quantum, Timing of First Birth, Conflict, Risk and Uncertainty

Reading: Ulijaszek (HBEBP, Ch. 10), Mace (2008), WWGS Ch. 13
Midterm Tuesday, in class

Week 6 (4-6 May). Growth and Development

Growth Curves, Standards, Z-Scores, Sex Differences, Brain Growth, Sexual Maturation, Comparative Growth, Wasting, Stunting, Inequality, Fetal Programming

Reading: Bogin & Smith (HBEBP, Ch. 11), Stinsen (HBEBP, Ch. 12)

Week 7 (11-13 May). Nutrition

Micronutrients, Macronutrients, Nutritional Deficiencies, Over-Nutrition, Evolutionary Disequilibrium, Metabolic Syndrome

Reading: Leonard (HBEBP, Ch. 11), WWGS Ch. 9-11
Assignment: Fetal Origins of Adult Disease, Adaptive Strategy?

Week 8 (18-20 May). Physiology of Human Adaptability

Adaptations to Temperature, Altitude, Radiation

Reading: Beall & Steegmann (HBEBP, Ch. 6), HAEA Ch 5-9

Week 9 (25-27 May). Social Relationships, Stress, and Disease

Social networks, Social Capital, Support

Reading: Berkman et al. (1979); Smith & Christakis (2008)
Short Paper Due

Final Exam: Tuesday, 8 June, 3:30-6:30, Location TBA