**Syllabus: Anth 161 Human Growth and Development**

**Winter 2014**

**Class Time:** Tu/Th 12:30-1:45 pm

**Location:** Phelps 1160

**Professor:** Aaron Blackwell

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**Office Hours:** Tu/Th 2:00-3:00

**Course Description:**

Have you ever wondered why children have such large heads but relatively small bodies? Why do humans grow differently than other primates and other animals? Are Pygmies "small but healthy"? Why is there now an obesity epidemic? How does development early in life relate to decline late in life? This upper-division course will analyze human growth and development from an evolutionary and cross-cultural perspective. Prenatal, infant, childhood, juvenile and adolescent periods and behavior will be compared and contrasted with developmental life history stages of other primates, particularly those of our closest living relative, the chimpanzee. A special emphasis will be given to differences across human cultures and to the ontogeny and evolution of the human brain. We will also focus on senescent decline in late adulthood, and the relationship between early fetal environment and late-life health outcomes. Other related topics include sexual dimorphism, fluctuating asymmetry, immune function, chronic disease, subcutaneous fat, play activities and parental care. Students will also learn basic tools for measuring and modeling growth.

**Recommended Preparation:**

1) ANTH 5 or 7, or an equivalent introduction to biology or biological anthropology.

2) At least one statistics course, such as ANTH 9 or an equivalent course.

3) Students must not be afraid of numbers, equations nor graphical representation of information. You will be using math (mostly algebra) in this course. You will need to manipulate quantitative data in a spreadsheet. Competency in algebra and simple statistics are required, and in calculus a plus!

**Class Format and Grading:**

The class will be primarily lecture. Class attendance is expected. To encourage attendance, i-Clickers will be used to assign participation and points from small pop quizzes. You must be in attendance to receive credit. The surprise pop quizzes will often refer to the material in the readings for that lecture day. There will also be regular homework assignments. There will be a midterm and final with a mixture of multiple choice and short answer questions. The final will be comprehensive.

Grade breakdown is as follows:

Midterm: 20%

Final Exam: 30%

Four Homework Assignments: 40%

I-clicker points and class participation: 10%

Note: Small amounts of extra credit may be offered from time to time.

**iClickers**

You will need an iClicker for this class. You must register your iClicker on Gauchospace for it to properly link with your identity.

**Readings**

Since the schedule may change somewhat, reading assignments will be posted weekly on Gauchospace. Don’t forget to check what is due so you stay on track.

One book should be purchased:

1. Barry Bogin (1999) Patterns of Human Growth. Cambridge Univ. Press.

Other readings will be posted on Gauchospace, and may include, but are not limited to:

1. Charnov and Berrigan (1993) "Why do female primates have such long lifespans..."Evolutionary Anthropology1:191-194.
2. Moses and Brown. 2003. Allometry of human fertility and energy use. *Ecology Letters* 6:295-300.
3. Leigh (2001) "Evolution of human growth" *Ev Anth*10:223-236.
4. Walker, R. et al. 2006. Growth rates, developmental markers and life histories in 21 small-scale societies. 2006. *American Journal of Human Biology*18:295-311.
5. Gluckman, P.D. (2007) Early life events and their consequences for later disease: a life history and evolutionary perspective. *American Journal of Human Biology* 19:1-19.
6. Barker, D., Gluckman, P., et al. 1993. Fetal nutrition and cardiovascular disease in adult life. *Lancet* 341:938-941.
7. Blackwell AD, Gurven M, Sugiyama LS, Madimenos FC, Liebert MA, Martin MA, Kaplan HS, and Snodgrass JJ. 2011. Evidence for a Peak Shift in a Humoral Response to Helminths: Age Profiles of IgE in the Shuar of Ecuador, the Tsimane of Bolivia, and the U.S. NHANES. PLoS Neglected Tropical Diseases 5:e1218.
8. Blackwell AD, Pryor III G, Pozo J, Tiwia W, Sugiyama LS, and Pryor G. 2009. Growth and market integration in Amazonia: A comparison of growth indicators between Shuar, Shiwiar, and nonindigenous school children. American Journal of Human Biology 21:161–171.
9. Blackwell AD, Snodgrass JJ, Madimenos FC, and Sugiyama LS. 2010. Life history, immune function, and intestinal helminths: Trade-offs among immunoglobulin E, C-reactive protein, and growth in an Amazonian population. American Journal of Human Biology 22:836–48.

**Statement on Academic Conduct and Integrity:**

It is expected that students attending the University of California understand and subscribe to the ideal of academic integrity, and are willing to bear individual responsibility for their work. Any work (written or otherwise) submitted to fulfill an academic requirement must represent a student’s original work. Any act of academic dishonesty, such as cheating or plagiarism, will subject a person to University disciplinary action. Cheating includes, but is not limited to, looking at another student’s examination, referring to unauthorized notes during an exam, providing answers, having another person take an exam for you, etc. Representing the words, ideas, or concepts of another person without appropriate attribution is plagiarism. Whenever another person’s written work is utilized, whether it be a single phrase or longer, quotation marks must be used and sources cited. Paraphrasing another’s work, i.e., borrowing the ideas or concepts and putting them into one’s “own” words, must also be acknowledged. Plagiarism is not limited to books or articles, but includes web-based materials, including Wikipedia. (https://judicialaffairs.sa.ucsb.edu/AcademicIntegrity.aspx)

**Statement on Students with Disabilities:**

Providing academic accommodations to students with disabilities is a shared responsibility of the campus. Students with disabilities are responsible for ensuring that the Disabled Students Program (DSP) is aware of their disabilities and for providing DSP with appropriate documentation. DSP is located at 2120 Student Resource Building and serves as the campus liaison regarding issues and regulations related to students with disabilities. The DSP staff works in an advisory capacity with a variety of campus departments to ensure that equal access is provided to all disabled students. (http://dsp.sa.ucsb.edu/)

**Tentative Class Schedule (Subject to Change)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Dates** | **Topics** | **Reading** |
| **1** | 1/6 | Introduction. What is growth? What is development? Why study growth and development? | Bogin Intro, Ch 1 |
|  | 1/8 | Genetics, Heritability, Plasticity | Bogin Ch 2 |
| **2** | 1/13 | Life History Theory. Selection and Optimality. Plasticity and Reaction Norms. | Charnov and Berrigan 1993 |
|  | 1/15 | Optimality and Growth. How do animals grow? Growth curves (distance, velocity, relative statistics) | Bogin Ch 3 |
| **3** | 1/20 | Human growth stages. Human vs. chimpanzee development. | Bogin Ch 4 |
|  | 1/22 | Anthropometry, Z-scores, growth standards and charts; computer exercises with MS Excel and R. Variation in modern human growth. (Note very important to learn how to do this for homework!) | Blackwell 2009 |
| **4** | 1/27 | Modelling Growth | Urlacher and Blackwell 2015 |
|  | 1/29 | Variation in Growth, Differences across populations | Bogin Ch 5Walker, R. et al. 2006 |
| **5** | 2/3 |  | Bogin Ch 6 |
|  | **2/5** | **Midterm in Class** |  |
| **6** | 2/10 | Back to First Principles: Allometry and energy distribution | Moses and Brown. 2003 |
|  | 2/12 | Expensive Tissues, Trade-offs |  |
| **7** | 2/17 | Growth and Disease, Growth and Immune Function | McDade 2005Blackwell et al 2011 |
|  | 2/19 |  |  |
| **8** | 2/24 | Development: What is development? Endocrine Regulation, Epigenetic regulation | Bogin Ch 7 |
|  | 2/26 |  |  |
| **9** | 3/3 | Developmental origins of health and disease | Gluckman 2007Barker 1993 |
|  | 3/5 | Obesity |  |
| **10** | 3/10 |  | Bogin Chapter 8 |
|  | 3/12 | Wrap-Up and Review |  |
| **Final** | 3/16 |  **Mon 12:00-3:00 Final Exam** |  |