

BIOLOGY IN SOCIAL SCIENTIFIC RESEARCH AND PRACTICE

Sociology 571

Fall 2010

Tuesday 9:50am-12:30pm

Davison Hall, Room 128

Professor: Kristen W. Springer

Department of Sociology

Davison Hall, Room 040

E-mail: kspringer@sociology.rutgers.edu

Office Hours: Tuesdays 1pm-2pm or by appointment

Course Website: sakai.rutgers.edu (course designation: "Soc 571: Biosociology")

Course Motivation: There is mounting interest and speculation about the role of biology in key sociological questions such as the intergenerational transmission of class, the causes of delinquency, and gendered occupational competencies. Further, there has been tremendous growth in the production and public dissemination of medical research linking biological and genetic factors to outcomes of great interest to social scientists. For example, biologists have recently identified the "fidelity gene" – a gene that affects brain chemicals related to men's propensity to be monogamous.

However, in general, social scientists are unwilling, uncomfortable, or inadequately trained to engage in these biological discussions. This class is designed to help prepare students to engage in these discussions and to conduct their own biosocial research. Specifically, the course is designed to introduce graduate students to different biological perspectives/tools that can be used in social science research and to explore the extent to which incorporating these tools improves our understanding of social phenomena.

Course Description: This course will be a mix between a survey course and a seminar, in that we will briefly cover a range of topics that could be a class in their own right (i.e. survey course), but we will also engage in rich and nuanced discussion of the material (i.e. seminar). We will focus on areas of biological research that are currently garnering the most social scientific interest and/or that have the greatest potential to contribute to understanding social processes and outcomes: psychoneuroimmunology (i.e. stress responses and mind/body connections); genetics and gene-environment interactions (including epigenetics); and sex hormones. We will devote the most time to genetic research. We will also spend a short amount of time discussing biomarkers in secondary datasets and brain imaging in neuroscience. We will explore applications of these biological tools to a wide range of social science topics (i.e. social support, criminology, deviance, gender, race, sexuality, marital dynamics, occupations, and health).

In addition to class discussion and presentations, we will have two junior scholars working on genetics and psychoneuroimmunology present their research to our class. Specifically, Zoe Donaldson (Neurogeneticist, Robert Wood Johnson Health & Society Scholars Program at Columbia University) will talk about her work on the "fidelity gene" and Catherine Taylor (Sociologist, Robert Wood Johnson Health & Society Scholars

Program at Columbia University) will present on her research on physiological stress-responses to occupational sex segregation. I hope this will be an opportunity to: 1) hear about cutting-edge biosocial research from rising stars, 2) learn about the process of conducting biosocial research from beginning to end, and 3) talk with scholars from different fields about their experience melding biological and social questions.

In this course, I assume no prior knowledge or understanding of biology and will begin each section with a basic tutorial, because I believe it is essential that everyone has a working knowledge of the biological concepts/measures before discussing their application to social phenomena. Those of you with expertise are welcome (and encouraged) to contribute.

At the end of the course, students will be able to understand how a range of biological tools may be used to potentially further social scientific research. Further, students will have the knowledge and language to begin conversing and collaborating with a range of biological scientists, and will have the building blocks to pursue more advanced research training in biological and biosocial techniques.

What this class is not: It is important to note that this class is focused on understanding, appreciating, and critiquing the incorporation of biological tools/perspectives *on their own terms*. In other words, this is not – and will not be – a course focused on the deconstruction or dismissal of biology. Rather, we will be critically engaged in discussing the potential role of biology and biosociology for understanding social phenomenon. We will end the semester focused on gender and hormones as a case study in which to think through and understand how to critique biological understandings of social phenomenon on their own terms. In short, I expect and encourage students to approach the class with an open, critical, and inquiring mind.

Overview of Course Requirements and Grading: Course grades will be based on three requirements: participation, class facilitation, and one or two writing projects. Students can choose between two different types of writing projects to best accommodate the fact that students are at different stages of thinking through integrating biology with social scientific research.

Incompletes will only be given for serious extenuating circumstances and with advance permission.

(1) Participation in weekly discussion (20 percent of class grade).

I will begin each class with a mini-lecture to help situate the readings and provide any necessary biological background information. After this mini-lecture, the class will function as seminar, and as such, I expect everyone to be fully prepared and participatory. Perhaps more than in some other seminars, it is essential that you are fully prepared for each and every one of our classes because much of the material will be technical and the readings will build on each other.

(2) Facilitation of one class (10 percent of class grade).

Each week, a student or pair of students will be responsible for leading the discussion portion of class. Every week each student is required to submit comments/questions about the assigned reading to the discussion leader(s) and me by noon on Monday. The student leader(s) should integrate this input and develop a coherent plan for discussion, not just a list of unrelated questions. Developing ways to incorporate the ideas submitted by other class members is an important part of the leadership role; summarizing readings assigned for the week in a way that presumes others in class have not read them is not “facilitating the class discussion.”

(3) Writing assignment

Students can choose between two types of writing assignments (integration essays or a final research paper/proposal), depending in their current level of engagement with biosocial research.

a. Integration essays (each worth 35 percent of class grade)

Students choosing this option will be required to submit two “think-piece” essays (~12 pages each) on how their specific area(s) of research might incorporate biological perspectives and tools to improve social scientific knowledge. Specifically, students will write about two biological perspectives (one for each essay) – including one of the following areas discussed in class: psychoneuroimmunology, genetics (or gene-environment interactions), or hormones. Students can take a broader meta-theoretical/historical/ethical approach related to their specific research interests or focus efforts around building a model relevant to answering/addressing particular research interests. In any case, I expect that all essays will accomplish and include the following:

1. Statement of your research interests/question
2. Short summary of relevant literature incorporating the specific biological tool for your question/interest (if none – state this and explain/hypothesize why)
3. Your assessment of the potential intellectual benefits of incorporating the specific biological tool into your specific research question -- what might science gain (if none – explain why)
 - Be specific here – I don’t want general “science would benefit because....” statements. I want thoughtful, detailed ideas about what might happen if you actually incorporate biological perspectives into *a very specific question/problem/issue.*
4. Briefly describe the research methods you might use to explore your questions.

All students will be expected to present one of their essays at the end of class.

Completion the essays will occur in stages:

Essay #	1	2
One page proposal due	10/26	11/16
Essay due	11/9	Finals week (exact date TBA)
Presentation of one essay	December 7, 2010	

b. Final research paper or proposal (70 percent of class grade)

The alternative writing assignment is the more typical final research proposal or research paper (~ 25 pages) on a biosocial research topic. Paper topics and methodology will be chosen in consultation with the instructor. A proposal should define a research question, review relevant prior studies, and propose a detailed strategy and justification for conducting an original research project. A final paper should be a solid draft of a research paper, qualifying paper, or dissertation chapter.

Completion of the proposal/paper will proceed in three steps.

1. Submit a brief (2-3 pages) proposal **by the start of class October 26th**. This brief proposal should be an early attempt to delineate your research interests and should move toward describing your research question, the biological tool(s)/perspective(s) to be employed, the methodology to be used, the analyses to be undertaken, and the potential scientific gain from this project.
2. Short (~10 minutes) presentations to the class on **December 7th**.
3. The final proposal/paper will be due during finals week – exact date TBA.

Schedule and Readings: All readings, with the exception of the following book, will be on our Sakai website. Please note that readings are subject to change. Jordan-Young’s book can be purchased through Amazon or another venue.

Jordan-Young, Rebecca. 2010. Excerpts. *Brain storm: The flaws in the science of sex differences*. Boston, MA: Harvard University Press.

Week 1 (9/7)	Intro
Week 2 (9/14)	<p>Why Explore Biosocial/Biological Perspectives on Social Issues?</p> <p>Freese, Jeremy, Jui-Chung Allen Li, and Lisa D. Wade. 2003. “The potential relevances of biology to social inquiry.” <i>Annual Review of Sociology</i>. 29:233–56</p> <p>Freese, Jeremy and Sara Shostak. 2009. “Genetics and social inquiry.” <i>Annual Review of Sociology</i>. 35:107–28</p> <p>Institute of Medicine (IOM). 2001. Summary of <i>Exploring the biological contributions to human health: Does sex matter?</i> Washington, DC: National Academy of Sciences.</p> <p>Springer, Kristen, Rebecca Jordan-Young, and Jeanne Stellman. <i>In Progress</i>. “Beyond a catalogue of differences: Towards a more scientific schema for understanding sex/gender in human health.” <i>Social Science Medicine</i>.</p> <p>Fausto-Sterling, Anne. 2005. “The bare bones of sex: Part 1—sex and gender.” <i>Signs</i>. 30(2):1491-528</p>
Week 3 (9/21)	Psychoneuroimmunology – Basics

	<p>Sapolsky, Robert. M. 2004. "Glands, gooseflesh, and hormones." In <i>Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping</i>. (Ch 2.) New York: W. H. Freeman and Company.</p> <p>Lovallo, William R. and Terrie L. Thomas. 2000. "Stress hormones in psychophysiological research." In John T. Cacciopo, Louis G. Tassinary, & Gary G. Berntson, <i>Handbook of Psychophysiology, 2nd Edition</i>, (pp. 342-367). Cambridge: Cambridge University Press.</p> <p>Gersten, Omer. 2008. "The path traveled and the path ahead for the allostatic framework: A rejoinder on the framework's importance and the need for further work related to theory, data, and measurement." <i>Social Science & Medicine</i>. 66(3): 531-535.</p> <p>Loucks, Eric B., Robert P. Juster, and Jens C. Pruessner. 2008. "Neuroendocrine biomarkers, allostatic load, and the challenge of measurement: A commentary on Gersten." <i>Social Science & Medicine</i>. 66(3):525-530.</p>
Week 4 (9/28)	Catherine Taylor Presenting
	<p>Dickerson, Sally S. and Margaret E. Kemeny. 2004. "Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research." <i>Psychological Bulletin</i>. 130 (3), 355–391.</p> <p>Nicolson, Nancy A. 2008. "Measurement of cortisol. In <i>Handbook of Physiological Research Methods in Health Psychology</i>, edited by Linda J. Luecken and Linda C. Gallo. Los Angeles: Sage Publications.</p> <p>Taylor, Catherine. 2010. "Biological and subjective responses to minority status and social exclusion in the workplace: A gendered perspective." <i>Dissertation</i>. (Read pages 26-53 and 73-111).</p>
Week 5 (10/5)	Psychoneuroimmunology – Applied & Secondary datasets
	<p>Adam, Emma. K. & Meena Kumari. 2009. Assessing salivary cortisol in large-scale, epidemiological research. <i>Psychoneuroendocrinology</i>, 34(10), 1423-1436.</p> <p>Lupien, Sonia J., Suzanne King, Michael J. Meaney and Bruce McEwen. 2000. "Child's stress hormone levels correlate with mother's socioeconomic status and depressive</p>

	<p>state.” <i>Biological Psychiatry</i>. 48: 976-980.</p> <p>Loving, Timothy, Kathi L. Heffner, Janice K. Kiecolt-Glaser, Ronald Glaser and William B. Malarkey. 2004. “Stress hormone changes and marital conflict: spouses' relative power makes a difference.” <i>Journal of Marriage and Family</i>. 66(3):595-612.</p> <p>Kiecolt-Glaser, Janice K., Phillip. T. Marucha, Ana. M. Mercado, William. B. Malarkey and Robert Glaser. 1995. “Slowing of wound healing by psychological stress.” <i>The Lancet</i>. 346(4): 1194-1196</p> <p>Massey, Doug. 2004. “Segregation and stratification: A biosocial perspective.” <i>Du Bois Review</i>. 1(1):7–25.READ ONLY BIOSOCIAL APPROACH (pages 20-22).</p> <p>Sapolsky, Robert. M. 2004. Junkies, adrenaline junkies, and pleasure. In <i>Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping</i>. (Ch 16.) New York: W. H. Freeman and Company.</p>
Week 6 (10/12)	Genetics Basics/How to Study Genetics for Social Scientists
	<p>Ridley, Matt. 2000. “Introduction.” <i>Genome: The autobiography of a species in 23 chapters</i>. (pp. 4-10). New York: Harper Collins.</p> <p>Carey, Gergory. 2003. <i>Human genetics for the social sciences</i>, Chapters 1, 3, and 18 (read chapter 17 for a statistics primer if needed; read chapter 19 for the statistical methods if desired)</p> <p>Vogler, George P. and Gerald E. McClearn. 2008. “Genetic markers in social science research: opportunities and pitfalls.” <i>Biosocial Surveys</i>. (pp. 194-207) Washington, DC: National Research Council.</p> <p>Guo, Guang and Daniel E. Adkins. 2008. “How is a statistical link established between a human outcome and a molecular genetic variant?” <i>Sociological Methods and Research</i>. 37: 201-226.</p>
Week 7 (10/19)	Genetics applied/Gene-Environment
	<p>Guo, Guang, Michael Roettger, and Tianji Cai. 2008. “The integration of genetic propensities into social control models of delinquency and violence among male youths.” <i>American Sociological Review</i>. 73:543-568.</p> <p>Bearman, Peter. 2008. “Introduction: exploring genetics and social</p>

	<p>structure.” <i>American Journal of Sociology</i>. 114 (Sppl): V-X.</p> <p>Martin, Molly. 2008. “The intergenerational correlation in weight: how genetic resemblance reveals the social role of families.” <i>American Journal of Sociology</i>. 114 (Sppl): S67-S105.</p> <p>Guo, Guang, Yuying Tong, and Tianji Cai. 2008. “Gene by social-context interactions for number of sexual partners among white male youths: genetics-informed sociology.” <i>American Journal of Sociology</i>. 114(Sppl): S36-S66.</p>
Week 8 (10/26)	Zoe Donaldson Presenting & Epigenetics basics
	<p>Pennisi, Elizabeth. 2001. “Behind the scenes of gene expression.” <i>Science</i>. 293(5532):1064-1067.</p> <p>Sapolsky, Robert. M. 2004. “Mothering style and methylation.” <i>Nature Neuroscience</i>. 7:791-792.</p>
Week 9 (11/2)	Epigenetics
	<p>Fraga, Mario F., Esteban Ballestar, Maria Paz, Santiago Roperro, Fernando Setién, Maria L. Ballestar, et. al. 2005. “Epigenetic differences arise during the lifetime of monozygotic twins.” <i>Proceedings of the National Academy of Sciences</i>. 102(30):10604-10609.</p> <p>Whitelaw, Nadia C. and Emma Whitelaw. 2006. “How lifetimes shape epigenotype within and across generations.” <i>Human Molecular Genetics</i>. 15(Review Issue 2):R131. *just read the following sections: Introduction, Studies in Humans, Epigenetic Inheritance, Conclusions.</p> <p>Kuzawa, Christopher. W. and Elizabeth Sweet. 2009. “Epigenetics and the embodiment of race: Developmental origins of US racial disparities in cardiovascular health.” <i>American Journal of Human Biology</i>. 21(1):2-15.</p> <p>McGowan, Patrick O., Aya Sasaki, Ana C D'Alessio, Sergiy Dymov, Benoit Labonté, Moshe Szyf, Gustavo Turecki and Michael J. Meaney. 2009. “Epigenetic regulation of the glucocorticoid receptor in human brain associates with childhood abuse.” <i>Nature Neuroscience</i>. 12:342-348</p>
Week 10 (11/9)	Genetics/Epigenetics Critical Lens
	Duster, Troy. 2005. "Medicine - race and reification in science." <i>Science</i> . 307:1050-1051.

	<p>Chaufan, Claudia. 2007. "How much can a large population study on genes, environments, their interactions and common diseases contribute to the health of the American people?" <i>Social Science & Medicine</i>. 65(8) 1730-1741.</p> <p>Institute of Medicine (IOM). 2006. "Ethical, legal, and social implications." <i>Genes, behavior, and the social environment: moving beyond the nature/nurture debate</i>. (pp. 202-218). Washington, DC: The National Academy Press.</p> <p>Keller, Evelyn Fox. 2010. "From individuals to populations." <i>The mirage of a space between nature and nurture</i>. (Chapter 3.) Durham, NC: Duke University Press.</p>
Week 11 (11/16)	Hormones/Gender – Basics/Interactional
	<p>Udry, J. Richard. 2000. "Biological limits of gender construction." <i>American Sociological Review</i>. 65:443-457.</p> <p>Booth, Alan, David Johnson, and Douglas Granger. 2005. "Testosterone, marital quality and role overload." <i>Journal of Marriage and Family</i>. 67:483-498.</p> <p>Jordan-Young, Rebecca. 2010. Selections TBD. <i>Brain storm: The flaws in the science of sex differences</i>. Boston, MA: Harvard University Press.</p>
Week 12 (11/23)	Hormones/Gender – Critical Lens
	Jordan-Young, Rebecca. 2010. Selections TBD. <i>Brain storm: The flaws in the science of sex differences</i> . Boston, MA: Harvard University Press.
Week 13 (11/30)	Catch-up, presentations, and/or neuroscience
Week 14 (12/7)	Presentations