

THE NEUROBIOLOGY OF BIAS AND DISCRIMINATION

NS M187 / Psych M166 / PhySci M106, Spring Quarter 2018

Course Directors (rotating):

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Teaching Assistant: Joey Ka-Yee Essoe (essoe@ucla.edu, office hours: Tu 11:00am-12:00pm)

Additional Contributing Faculty: Arthur Arnold, Ketema Paul, Michelle Frazer

Meeting Time: Tu/Th 9:30-10:45am; Physics and Astronomy Building 1434A

Course Overview:

The mammalian brain has evolved to optimize survival in the environment in which it finds itself. Bats for example dedicate much of their brain to auditory processing to effectively navigate and hunt food by echolocation, whilst human brains have developed extensive cortical regions to support executive function and planning. The human brain is particularly adept at survival in many different environments and in societies with vastly different values and beliefs. However, our evolutionary history has also biased our brains to preferentially attend to and learn certain types of information at the expense of others, to pursue rewarding stimuli and avoid aversive stimuli, to modify our responses based on prior experiences and anticipated outcomes, and to adopt mental shortcuts (heuristics) to facilitate quick decision making. Although such biases serve us well in many circumstances, they can occasionally lead us astray. For instance, we are biased to accept evidence that adheres to our preexisting beliefs and ignore evidence that contradicts these beliefs. We are prone to making over-generalizations about the characteristics of groups of people, leading us to develop stereotypes and prejudices. And, whether we realize it or not, we often develop biases to favor members of our in-group and to fear members of other groups. This course aims to explore the aspects of mammalian brain function that generate preference, bias, and discrimination. To do so, we will consider research at multiple levels of analysis, from genetics to neural circuits to behavior. We will also discuss the societal implications of these research findings, including their relevance to public policies and the criminal justice system. The course is designed for junior and senior undergraduate students with a psychology or neuroscience background and will cover broad areas of neuropsychology.

Grading:

Midterm Exam	25%	Class Presentation	25%	Question Submission	5%
Final Exam	30%	i>clicker Quizzes	10%	Clicker Participation	5%

By default, the following scale will be used to assign your grade for this course:

<u>Percentage:</u>	<u>Grade:</u>	Plus (+) grades will only be assigned for the top three percentage points in any grade range (e.g., B+ = 87-89), and minus (-) grades for the bottom three percentage points (e.g., A- = 90-92). Your final course percentage grade will be rounded to the nearest integer using standard rounding rules.
90..100	A-..A+	
80..89	B-..B+	
70..79	C-..C+	
60..69	D-..D+	

Honors option:

Honors can be earned by writing an 8 to 10-page (double spaced) paper that dives deep into the subject of the neuroscience of bias complete with a reference list of at least 12 cited works and turning that paper in by the start of the last class meeting before finals. Alternatively, you can orchestrate a community outreach effort to help members of the public to better understand and/or overcome bias (e.g., giving a presentation within the UCLA community or at a local K-12 school) and write up a report of your effort, including feedback you received and the potential impact of your outreach. If you are interested in honors, please see Dr. Poe in the first 3 weeks of class to establish your honors topic and get guidance on the subject and content of your research or outreach plan.

Use of i>clickers:

An *i>clicker* remote is required for this course so that you can respond to in-class quizzes (graded), and to other (non-graded) questions that are posed in class. You may use either an original *i>clicker*, *i>clicker+*, or *i>clicker2*. We will not be using the alphanumeric features of the *i>clicker2* in this course, but future courses you take at UCLA might require this newer model, so you may want to consider investing in it now. Please register your clicker on the CCLE course website, where you will find an *i>clicker* “Remote Registration” link. **We will begin using the *i>clickers* in class on Thursday April 5th, so please make sure you have yours by then.** *Responding in class for another person (by using their remote) or having someone attend class and respond for you is academic misconduct and will be treated as such.*

Class Participation:

During class, questions will periodically come up that require a clicker response. Responses to these clicker questions are *not graded* and are primarily used to encourage active class participation. Your clicker response rate to these questions (regardless of the accuracy of your responses) will be the primary determinant of the *Class Participation* portion of your course grade. Every student will receive one “freebie” for this portion of their grade, in order to accommodate an absence or clicker malfunction.

Clicker Quizzes:

Some class sessions will begin with a brief quiz administered with the *i>clickers*. These low-stakes quizzes are designed to assess your understanding of the topics covered in the lectures and assigned readings. If you read the assigned articles, watch the assigned videos, and pay close attention during the lectures, you should do just fine. If you forget to bring your clicker to class on a given day or it is out of batteries or malfunctioning, unfortunately you will receive 0 points for that day’s quiz. However, we allow for these sorts of issues by automatically dropping your lowest quiz score for the quarter. Extensive research on learning has shown that students consistently perform better on a final test if they take practice tests on a lesson (such as these mini-quizzes), as compared with simply restudying the lesson materials; this phenomenon is known as the “testing effect” (Roediger & Karpicke, 2006).

Exams:

The midterm and final exams will consist of a mixture of multiple-choice, short answer, and essay questions. You are responsible for everything covered in the assigned readings, lectures, and presentations. An attempt will be made to design questions that test your knowledge of general concepts and definitions, underlying principles, and important experimental methods and results. A portion of the final exam will contain questions you and other students create from the main points of your presentation. You should study and read for comprehension as opposed to brute memorization. The final exam will assess your cumulative understanding of the course material from the entire quarter, including the topics covered in the student presentations. As a matter of policy, the exams will occur as scheduled with no make-up exams. If you have an unavoidable conflict for either exam, please notify the instructors at your earliest convenience.

Class Presentations:

Weeks 8-10 will consist of student-led presentations. Students will be assigned to groups of three, and each group will post a YouTube video presentation on a topic associated with some aspect of bias. Each presentation should be about 10 minutes and not more than 15 min in length. Your presentation must be uploaded by 11:59pm on **May 18th**.

During Weeks 8-10, the entire class will be assigned to watch five specified presentations for each class session. All students will be required to submit thoughtful discussion questions about each of the presentations they have watched at least 24 hours before class; this is intended to (1) demonstrate that you have watched the assigned videos, as well as to (2) provide questions for each video's creators to discuss during class. Your submission of these questions will constitute the *Question Submission* portion of your grade (5%). During class, the creators of each of the five assigned videos will have ~ 6 minutes to highlight the main points of their videos (they should prepare a **single** PowerPoint slide with **up to 5 main** points) and ~ 6 minutes to field audience questions. More details about the structure of this assignment will be provided in class.

Presentations should include:

- a) history of the presentation area
- b) relevant examples of bias
- c) neurobiology of the neurotransmitters, circuits and/or brain areas involved in creating bias
- d) discussion of what we learn from these biases and what we could do to combat them

Students are expected to meld the course's didactic material with material from scholarly sources such as PubMed, books, and articles, but additional internet material can be used as well. All sources should be documented and accurately referenced in the presentation. The final exam will combine testing on the didactic material as well as material covered in the student presentations.

Example presentation topics include (but are not limited to):

- Advertising of alcohol and/or tobacco products
- Advertising of junk food
- Bias in legislation, enforcement, and sentencing policies concerning controlled substances
- How anthropomorphizing animals in films like Ratatouille creates bias against animal research
- Sex differences and bias in decision-making
- PTSD in soldiers returning from Iraq/Afghanistan and subsequent bias
- Alcohol, impulsivity, and loss of inhibitory control in bias-insensitive behavior
- Cognitive training approaches for debiasing biased individuals
- Peer influences on judgment and decision-making
- Priming and subsequent bias in decision-making
- Neural mechanisms of stereotype threat
- Racial bias as a result of television/film priming
- Role of fashion modeling and advertising in creating image bias
- Role of religion in creating bias
- Bias against individuals who practice a specific religion or religious group
- Bias in politics
- How social media fosters biases
- Gender bias
- Sexual orientation bias
- Mental disorders and bias
- Cross-cultural differences in bias

Policy on Incompletes:

To receive an Incomplete, you must have completed more than half the course, including the midterm exam, with passing scores. Be sure to check with the Undergraduate Advising Office and instructors if you are planning to take an Incomplete.

Academic integrity:

Academic dishonesty, including, but not limited to, cheating or plagiarism, is a serious violation of UCLA's code of student conduct. Any act of academic dishonesty will be reported to the Dean of Students' Office for adjudication.

Accommodations for Disabilities:

If you wish to request an accommodation due to a disability, please contact the Office for Students with Disabilities as soon as possible at A255 Murphy Hall, (310) 825-1501, (310) 206-6083 (telephone device for the deaf). Website: www.osd.ucla.edu.

Campus Resources and Support Services around UCLA Available to Students:

- Academic Achievement Program: AAP advocates and facilitates the access, academic success, and graduation of students who have been historically underrepresented in higher education; informs and prepares students for graduate and professional schools; and develops the academic, scientific, political, economic, and community leadership necessary to transform society. Learn more at <http://www.aap.ucla.edu>
- Academics in the Commons at Covell Commons: (310) 825-9315 free workshops on a wide variety of issues relating to academic & personal success www.orl.ucla.edu (click on "academics")
- Bruin Resource Center: Includes services for transfer students, undocumented students, veterans, and students with dependents. <http://www.brc.ucla.edu/>
- Career Center: Don't wait until your senior year – visit the career center today! <http://www.career.ucla.edu/>
- Center for Accessible Education (Formerly Office for Students with Disabilities): A255 Murphy Hall: (310) 825-1501, TDD (310) 206-6083; <http://www.cae.ucla.edu/>
- College Tutorials at Covell Commons: (310) 825-9315 free tutoring for ESL/math & science/composition/and more! www.college.ucla.edu/up/ct/
- Counseling and Psychological Services Wooden Center West: (310) 825-0768; www.caps.ucla.edu
- Dashew Center for International Students and Scholars 106 Bradley Hall: (310) 825-1681; www.internationalcenter.ucla.edu
- Dean of Students Office; 1206 Murphy Hall: (310) 825-3871; www.deanofstudents.ucla.edu
- Lesbian, Gay, Bisexual and Transgender Resource Center Student Activities Center, B36: (310) 206-3628 www.lgbt.ucla.edu
- Letters & Science Counseling Service: A316 Murphy Hall: (310) 825-1965; www.college.ucla.edu
- Library: Get help with your research, find study spaces, attend a workshop, rent a laptop, and more. Learn more: <http://www.library.ucla.edu/>
- Students in Crisis: From the Office of the Dean of Students: Faculty and Staff 911 Guide for Students, commonly known as the "Red Folder." This tool is intended to provide you with quick access to important resources for assisting students in need.
- Student Legal Services; A239 Murphy Hall: (310) 825-9894; www.studentlegal.ucla.edu
- Undergraduate Research Portal: The Undergraduate Research Portal helps students and faculty connect over research opportunities. It's available now under the Academics tab on MyUCLA and can be directly accessed at, urp.my.ucla.edu
- Undergraduate Writing Center: Peer learning facilitators (PLFs) are undergraduates who understand the challenges of writing at UCLA. Scheduled appointment and walk-in options are available, see www.wp.ucla.edu/uwc for more information about writing programs and to get assistance with your writing.
- UCLAONE.com: UCLA ONE is UCLA's interactive, online gateway for mentorship, professional networking, peer driven career advice and exclusive job leads. (Similar to LinkedIn for the UCLA community)

SCHEDULE OF TOPICS AND READINGS

Week 1

4/3: **General course overview (Poe/Rissman/Evans) and opening remarks by Ketema Paul**

4/5: **Reflections on the pervasiveness of bias and discrimination (Poe/Rissman)**

- How discriminatory biases influence hiring choices, law enforcement policies, incarceration, and many other facets of society

Week 2

4/10: **The mammalian brain – structure and function relevant to bias (Evans)**

- Lessons from strokes, accidents and lesions

4/12: **Brain circuitry involved in reward and habit learning (Evans)**

- Reward learning (drugs and prairie vole partner preference). Drug-induced perturbation of behaviors.

Week 3

4/17: **Neural mechanisms of fear learning (Rissman)**

- How environmental stimuli and contexts become associated with aversive responses; relevance to biases against social groups

4/19: **Development of Bias (Frazer)**

- The adolescent brain: impulsivity, peer-influences, and the interplay between frontal lobe and striatal circuits

Week 4

4/24: **Sex Differences: Equity or Equality? Discussions (Arnold)**

- Biological factors that make males and females different, and the biases that these create

4/26: **Biases in sensory perception and attention (Rissman)**

- How the brain actively constructs subjective interpretations of the objective sensory world that are biased by heuristics, assumptions, past experiences, goal states, and context

Week 5

5/1: **Biases in memory formation and retrieval (Rissman)**

- How our memories for past events are often grossly inaccurate and biased by a host of factors; understanding implicit memory and priming effects; emotional memories

5/3: **The neuroscience of racial prejudice (Rissman)**

- What human neuroimaging studies have revealed about the biological underpinnings of implicit racial bias and the “other-race” effect

Week 6

5/8: **Midterm Exam**

5/10: **Consolidation of bias / changing the mind / schema changes (Poe)**

- Studies testing various techniques in reversing bias have come up with specific recommendations of learning tactics as well as approaches that are not successful. What is the most effective strategy(ies) and how well do they work?

Week 7

5/15: Neuroscience underlying reversal learning of bias (Poe)

- Fear is one of the hardest biases to unlearn. Does unlearning require forgetting or formation of new memories? If the latter, how do these two conflicting memories interact normally, and in cases of disorder?

5/17: Reversing bias – *continued* (Poe)

- The neural requirements underlying “unlearning” bias: how schema are loosened and reformed during sleep after intentional waking reversal learning.

Weeks 8-10

Student Presentations and Q&A Discussion

(NOTE: content from these presentations will be included in the final exam)

FINAL EXAM: June 12, 11:30am-2:30pm, location TBD