Inquiry in the Cognitive Sciences

PNP 201 | Fall 2018
Washington University in St. Louis

Instructor:	Nic Koziolek
Email:	nkoziolek@wustl.edu
Office:	101 Wilson Hall
Office Hours:	TR 10:30–11:30, and by appointment
Class Meetings:	TR 1:00–2:30, Psychology 251
Required Text:	*Methods in Mind*, edited by Carl Senior, Tamara Russell, and Michael S. Gazzaniga (The MIT Press, 2006) All other readings will be made available on Canvas
Assignments:	Attendance/Participation (10% of final grade) Journal Clubs (five, 30% total) Mid-Term Exam (30%) Final Exam (30%)

1 Course Description

This is a technique-based introduction to contemporary cognitive neuroscience, designed to complement PNP 200: Introduction to Cognitive Science. Class sessions will be split between lectures—which will cover major techniques in cognitive science—and journal club discussions—which are designed to improve your ability to read and understand original scientific studies. Along the way, we will also touch on some important themes in the philosophy of mind and the philosophy of science.

2 Course Objectives

The aim of this course is for you to acquire:

1. reading knowledge of the central techniques of cognitive science and neuroscience;
2. an understanding of the strengths and weaknesses of different investigative strategies;
3. an understanding of how different techniques can be integrated;
4. the ability to read, summarize, and criticize research reports;

5. some basic theoretical background knowledge in cognitive science and neuroscience; and

6. familiarity with some of the more basic philosophical questions concerning the sciences of the mind and brain.

3 Assignments

Exams

There will be two exams: a mid-term and a final. The mid-term will be on Thursday, October 11 (our last class meeting before fall break), during our normal class time; the final will be on Tuesday, December 18, from 1:00–3:00pm. Both exams are designed to test your mastery of the course content. They will be partly multiple choice, partly short answer, and partly essay. They will not be cumulative. I will provide you with a study guide one week before each exam. There will also be an optional in-class study session during our last class meeting before the final exam.

Journal Club Papers

You will be required to write five short papers (650 words, or about two pages), each of which will answer six crucial questions about a different scientific study. These papers are designed to teach you how to read, summarize, and criticize research in cognitive neuroscience.

More specifically, each of your journal club papers must answer the following six questions, in order:

1. **What was done?** What is the central experiment or set of experiments in this report? What are the most important methodological features of the study?

2. **Why was it done?** What is the reason for doing the experiment? What question is it designed to answer?

3. **What did they find?** What are the crucial numerical comparisons/data that constitute the central findings of the paper?

4. **What does it mean?** What conclusions do they draw from this data?

5. **What's wrong?** Can you find any limitations in the study?

6. **What's next?** What further studies could be done?

The 650-word limit is absolutely strict: papers that are longer than 650 words will be returned without a grade. Accordingly, your submission must include an accurate word count; please put this on the very first line of your Canvas submission (Canvas helpfully provides the word count for you near the bottom right-hand corner of the text box).

Also, because I will be grading these papers anonymously, you should *not* put your name anywhere in the body of your paper.

We will have ten journal club discussions throughout the semester, but each of you will write a paper on only five of the associated studies. Accordingly, I have divided you into two groups, A and B. If you're in group A, you'll write a paper on the studies marked "JC A" in the course schedule; similarly if you're in group B. Papers will be due at 12:00pm (i.e., an hour before class) on the day we're scheduled to discuss the relevant study. Late submissions will immediately be docked 5 points (out of 100); after that, they'll be docked 10 additional points for each day they're late.

I expect you to participate in class discussion on journal club days whether or not you wrote a paper for that day. So you always need to read the assigned study and come to class prepared to discuss it. These class discussions, along with the papers themselves, are an opportunity for you to perfect your own writing, to think critically about the assigned studies, and to learn the journal club material for the exams. Keep in mind that you will be responsible for learning the material in *all* of the studies we cover this semester. So it's in your interest to take notes on the answers to the journal club paper questions even on days on which you don't submit a paper.

Attendance and Participation

Attendance is strictly required, and unexcused absences will result in a loss of attendance/participation points. To receive full points for attendance/participation, you need (i) to show up to class and (ii) to show that you're engaged in the course, either by asking good questions in class, or by emailing me with good questions that I can address in class, or by coming to my office hours.

4 Policies

Academic Integrity

Cheating and plagiarism are strictly forbidden. If you are caught cheating or plagiarizing, you will fail the course, and your case will be recommended to the student judicial board. This means, specifically, that you are not allowed to copy text, or even to closely paraphrase text, from the journal club article itself or from someone else's journal club paper. To review the university's policies on academic integrity, please consult http://www.wustl.edu/policies/undergraduate-academic-integrity.html. If you still have questions about what is and isn't permissible for you to do in your papers, please talk to me.

Technology in Class

You may bring a computer or tablet to class for use in viewing course material or taking notes, but you are allowed to use it *only* for course-related purposes. If you are caught using your computer or tablet for any non-course-related purpose, you will be marked

absent for the day. Similarly, if you are caught using your phone *for any reason at all*, you will be marked absent for the day; in other words, you are *not* permitted to use your phone even for course-related purposes.

Disabilities

Washington University is committed to providing accommodations and/or services to students with documented disabilities. Students who are seeking support for a disability or a suspected disability should contact Disability Resources at 314-935-4153. Disability Resources is responsible for approving all disability-related accommodations for WU students, and students are responsible for providing faculty members with formal documentation of their approved accommodations at least two weeks prior to using those accommodations. I will accept Disability Resources VISA forms by email and personal delivery. If you have already been approved for accommodations, I request that you provide me with a copy of your VISA within the first two weeks of the semester. For more information, please visit http://cornerstone.wustl.edu/disability-resources/.

Assistance

I encourage you to email me to come to office hours to discuss course material or assignments. My general attitude is: if you have questions, ask them. There are also some university-provided services that you might find useful:

Cornerstone: Academic peer mentors, study skills workshops, and other useful services, plus Disability Resources and the university's TRiO program.
http://cornerstone.wustl.edu.

Writing Assistance: Free one-on-one tutoring.
https://writingcenter.wustl.edu.

Diversity and Inclusion: The center's staff supports and advocates for students from traditionally underrepresented or marginalized populations and creates collaborative partnerships with campus and community members to promote dialogue and social change.
https://diversity.wustl.edu/framework/center-diversity-inclusion.

Peer Counseling: https://unclejoe.wustl.edu.

5 Schedule

This schedule of readings is subject to revisions. Changes from the original schedule (should any need to be made) will be in blue. You are responsible for checking Canvas for changes to the schedule, as well for other announcements pertaining to the course, our schedule, and your assignments.

Each reading is to be completed *before* the class meeting on the date for which it is assigned, as are the associated journal club papers.

Date	**Topic**	**Reading**
Aug 28	Introduction	Craver, "Interlevel experiments and multilevel mechanisms"
Aug 30	Basic Stats	Levitin, "Experimental design in psychological research"
Sep 4	Behavior	Krakauer, "Neuroscience needs behavior"
Sep 6	JC A	Klein et. al., "The role of episodic and semantic memory in the development of trait self-knowledge"
Sep 11	Developmental	Aslin, "What's in a look?"
Sep 13	JC B	Geraci and Surian, "The developmental roots of fairness"
Sep 18	Cross-Cultural	Henrich et. al., "The weirdest people in the world?"
Sep 20	JC A	Gendron et. al., "Perceptions of emotion from facial expressions are not culturally universal"
Sep 25	The Brain	Gazzaniga, "Principles of human brain organization derived from split brain studies"
Sep 27	Animal Cognition	Penn et. al., "On the lack of evidence that non-human animals possess anything remotely resembling a 'theory of mind'"
Oct 2	JC B	Bugyar et. al., "Ravens attribute visual access to unseen competitors"
Oct 4	Neuroimaging	Aguirre, "Functional neuroimaging"
Oct 9	JC A	Saxe et. al., "Making sense of another mind"
Oct 11	Mid-Term Exam	
Oct 16	NO CLASS	FALL BREAK
Oct 18	Philosophy: Consciousness	Chalmers, "How can we construct a science of consciousness?"
Oct 23	Philosophy: Intentionality	Searle, "Is the brain's mind a computer program?" and Churchland and Churchland, "Could a machine think?"
Oct 25	Philosophy: Understanding	Haugeland, "Understanding natural language"
Oct 30	Neuropsychology	SRG, Ch. 3
Nov 1	JC B	Race et. al., "Medial temporal lobe damage causes deficits in episodic memory and episodic future thinking not attributable to deficits in narrative construction"
Nov 6	TMS	SRG, Ch. 1
Nov 8	JC A	Rossi et. al., "Prefontal cortex in long-term memory"

Nov 13	Electrophysiology	SRG, Ch. 6
Nov 15	JC B	Wood et. al., "Hippocampal neurons encode information about different types of memory episodes occurring in the same location"
Nov 20	Optogenetics	Deisseroth, "Optogenetics"
Nov 22	JC A	Redondo, et. al., "Bidirectional switch of the valence associated with a hippocampal contextual memory engram"
Nov 27	EEG	SRG, Ch. 10
Nov 29	NO CLASS	THANKSGIVING
Dec 4	JC B	De Smedt, et. al., "An EEG study of creativity in expert classical musicians"
Dec 6	Final Review	
Dec 18	Final Exam	1:00-3:00