



## *Laboratory in Cognitive Processes*

*(COGS 1530, CRN 15569)*

*Fall 2008*

*Professor Kathryn Spoehr*

Class Meeting Time: W 3:00 – 5:20 p.m.

Location: 204 Metcalf Chemistry

### **Instructor Information:**

#### **Faculty Instructor:**

Professor Kathryn T. Spoehr

Dept. Cognitive and Linguistic Sciences

Office Location: 229A Metcalf Research Lab

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Personal Website:

<http://cog.brown.edu/~spoehr/>

Office Hours: W 10:00 a.m. - 12:00 noon

#### **Teaching Assistant:**

Adam Darlow

Dept. Cognitive & Linguistic Sciences

Office Location: 121 Metcalf Research Lab

Phone: x3- 2497

Email: Adam\_Darlow at Brown.edu

Personal Website:

<http://cog.brown.edu/~adarlow>

Office Hours: Th 1-2; M 2:30-3:30 (office hours to be held in 204 Metcalf Research)

### **About This Course:**

#### **Prerequisites:**

COGS0090, COGS0420 and COGS0440, or permission from the instructor.

#### **Format:**

Each class meeting will be a mixture of chalk talk, discussion, student presentations, and hands-on laboratory data collection and analysis. It is very important that students prepare for and attend every class.

#### **Goals:**

By the end of the semester students who have taken this course should be able to:

- understand and practice principles of good and ethical experimental design in experimental studies of human cognition;
- know and use appropriate methods and procedures in experimental studies of human cognition;
- apply appropriate data analysis techniques to the various types of behavioral measurements typically collected in experimental studies of human cognition.
- use MatLab tools for data collection and analysis.
- report in writing the results of experimental studies of human cognition in a form suitable for publication in scientific journals.

**Required Textbooks (available at Brown Bookstore or at brunobooks.com):**

Shaughnessy, J. J., Zechmeister, E. B., & Zechmeister, J. S. (2008) *Research Methods In Psychology, 8th Edition*. New York, McGraw Hill. (ISBN 13 9780073358260). This book is also available as an e-book through the Bookstore at slightly lower cost than the printed version. [Abbreviated **SZZ** in Reading Assignments below]

Stanovich, K. (2007). *How To Think Straight About Psychology (8th Ed.)*. Boston: Allyn & Bacon. (ISBN: 0205485138, pbk). [Abbreviated **ST** in Reading Assignments below]

Supplementary readings and information, including tutorials, can be found on the course's myCourses website.

Students may also wish to consult the textbook from their statistics course (e.g., PSYC/COGS 0090) when doing data analysis in this course

**Assignments and Grading Policy:**

1. Two Research Reports (20% of course grade each) based on experimental data collected in class. Submit the reports electronically through the course website.
2. Independent Research Project (40% of course grade in total): Each student must complete an independent research project investigating some aspect of human cognition. The project consists of three parts:
  - a. A proposal describing the rationale and plan of the research project. Submit the proposal electronically through the course website. Due by the beginning of class on October 22. (10% of course grade)
  - b. An oral presentation of the project (15 mins.) and its findings in class. Presentations will be held on December 3 and 10. (10% of course grade)
  - c. A written report of the project. Submit the project electronically through the course website. Due by noon on December 12. (20% of course grade)
3. Class Attendance and Participation (10% of course grade): Being an effective class participant is very important in this course because much of what you will learn will be from the other students in class. Effective class participation involves not only preparation and speaking skills, but also listening skills. Guidelines for evaluating class participation can be found on the course website.
4. Periodic assignments (10% of course grade): Several short written or required discussion board participation assignments will be given throughout the semester.
5. Department Colloquium: Attendance at the Monday afternoon colloquia in Cognitive and Linguistic Sciences is encouraged but not required. Colloquia are held in room 129 Metcalf Research at 4:00 p.m., and a schedule can be found on the course website under "General Information." Professor Spoehr will alert the class to particularly interesting and relevant items on the schedule.

6. Surveys: Each student is required to respond to the Initial Student Survey, and one self-assessment. These items can be found on the course website under the *Assessments* course tool on the left of the screen. Dates on which surveys are due are listed on the course schedule below.
7. Grading: Letter grades in the course will be assigned based on grades earned on the elements listed above. A student's final letter grade in the course exercise will be lowered by  $\pm$  (i.e., B+ goes to B, B goes to B-, B-goes to C+, etc.) if the student has not completed the surveys/questionnaires (#4 above).
8. Late Policy: A student's letter grade on any assignment will be lowered by  $\pm$  (i.e., B+ goes to B, B goes to B-, B-goes to C+, etc.) for every day, or part thereof, that the exercise is turned in late without prior permission.
9. Special Circumstances: Students who have special physical or learning needs should inform the instructor as soon as possible at the beginning of the semester, and should provide official notification from the appropriate dean or service office detailing the type of accommodation required.

### **Academic Integrity and Plagiarism Policy:**

Most of the work in this course, as well as how much you will benefit from the course, depends upon your personal integrity and intellectual honesty. Here are a few general guidelines:

1. Interact. Feel free to discuss your reading and ideas with other students, the professor, and the teaching assistant as much as seems helpful. Discussion exposes gaps in understanding and flaws in reasoning, and aids in learning the material.
2. Do your own written work. Any work you turn in should be your own, and should not be copied from other students or from digital or printed sources without proper bibliographic citation. Discussion with others may influence your thinking, and if such influence is considerable, it is appropriate to acknowledge it in a note. It is not necessary to mention assistance given by the professor. Also, most papers can be improved by having a friend or classmate read and critique a draft. Such help with writing need not be acknowledged. Do not submit as your own work a paper or other written assignment that was written by someone else, or submit a paper or part of a paper for which you have received or expect to receive credit at any other time or place. If, under special conditions the professor approves the preparation of a paper by two or more students, this should be indicated on the paper.
3. Give credit for ideas or expressions obtained from published sources by proper citation of the source: exact quotes must be enclosed in quotation marks and sources given for ideas expressed in new words (i.e., your paraphrases of someone else's words). The preferred form for citation is that suggested by the Style Manual of the American Psychological Association. If you have any questions about whether or how to acknowledge sources, be sure to ask the professor.
4. Students are expected to adhere to the standards of intellectual integrity set forth in Brown University's Academic Code. Violations of the Code will be referred to the Dean of the College's or Dean of the Graduate School's office, as appropriate.

## Schedule & Reading Assignments:

**Note:** \* indicates readings available digitally on course website.

<b>Date</b>	<b>Class Activities &amp; Discussion Topics</b>	<b>Reading</b>	<b>Assignment</b>
9/3	Introduction  Scientific Approach to Cognition <ul style="list-style-type: none"> <li>• Scientific method vs. intuition vs. faith</li> <li>• Falsifiability</li> <li>• What's a model?</li> </ul>	<b>ST:</b> Chs. 1, 2, 3  <b>SZZ:</b> Chs. 1, 2	
9/10	Experimental Design: The Basics <ul style="list-style-type: none"> <li>• Measurement &amp; Generalizability</li> <li>• Correlational vs. experimental techniques</li> </ul> Data Collection: Stroop Experiment  Writing: APA style <ul style="list-style-type: none"> <li>• Reporting methods</li> </ul>	* Stroop, J. R. (1935). Studies of Interference in serial verbal reactions. <i>J. Exp. Psychol.</i> , 18(6), 643-662.  <b>ST:</b> Chs. 4, 5, 6  <b>SZZ:</b> Chs. 4, 5	<b>Complete Initial Student Survey by midnight Fri. 9/12</b>
9/17	Methodology <ul style="list-style-type: none"> <li>• Confounds</li> <li>• Sampling &amp; selectional biases</li> <li>• Speed-accuracy trade-offs</li> <li>• Between- vs. within-group (repeated measures) designs</li> </ul> Data Collection: Sternberg experiment	* Sternberg, S. (1966). High-speed scanning in human memory. <i>Science</i> , 153(3736), 652-654.  * Sternberg, S. (2004). "Reaction-time Experimentation" (proseminar notes)  <b>ST:</b> Ch. 7  <b>SZZ:</b> Chs. 7, 8	<b>Write-up of Stroop experiment methodology (submit electronically before class; bring a copy to class for discussion)</b>
9/24	Data Analysis <ul style="list-style-type: none"> <li>• Comparing Means</li> <li>• Looking for trends</li> <li>• Interactions vs. main effects</li> </ul> Using MatLab for data analysis  Writing: APA style <ul style="list-style-type: none"> <li>• Reporting results</li> </ul>	<b>SZZ:</b> Ch. 12, 13   * MatLab for Psychologists * MatLab Statistics * Purdue Owl APA Formatting & Style Guide	

Date	Class Activities & Discussion Topics	Reading	Assignment
10/1	Pitfalls of Experimental Design <ul style="list-style-type: none"> <li>• Role of chance</li> <li>• Experimenter biases</li> <li>• Convergence of evidence</li> </ul> Planning for second class experiment (Mental Rotation?)	<b>ST:</b> Chs. 8, 9, 10, 11	<b><i>Report on Sternberg experiment (submit electronically by midnight on 9/31)</i></b>  <b><i>Student Self-assessment due by midnight Fri. 10/3</i></b>
10/8	Observation and Survey Research methods  MatLab PsychToolbox programming tutorial  Data Collection: 2 <sup>nd</sup> class experiment	<b>SZZ:</b> Chs. 4, 5  * Psychtoolbox Tutorial	
10/15	Topics in Design and Analysis <ul style="list-style-type: none"> <li>• Complex experimental designs</li> <li>• Exploratory data analysis</li> <li>• Correlational analysis</li> </ul> Writing: APA style <ul style="list-style-type: none"> <li>• Introductions and conclusions</li> </ul> Data Analysis: 2 <sup>nd</sup> class experiment	<b>SZZ:</b> Chs. 9, 14  <b>Additional readings (TBD)</b>	<b><i>Each student is responsible for collecting additional data from at least two (2) additional volunteers. Bring the data to class</i></b>
10/22	Applied Research  Ethical Issues <ul style="list-style-type: none"> <li>• Demand characteristics</li> <li>• Informed consent and protection of human subjects</li> <li>• Conflict of interest</li> </ul> Getting research ideas	<b>SZZ:</b> Ch. 11  <b>SZZ:</b> Ch. 3  * Blass, T. (2002). The man who shocked the world. <i>Psychology Today</i> , Mar/Apr 2002.  * Milgram Experiment Movie  * Brown Website on the Responsible Conduct of Research (website)	<b><i>Report on 2<sup>nd</sup> class experiment (submit electronically before class)</i></b>

<b>Date</b>	<b>Class Activities &amp; Discussion Topics</b>	<b>Reading</b>	<b>Assignment</b>
10/29	Final Project Ideas <ul style="list-style-type: none"> <li>• Class discussion</li> </ul>	-----	<i><b>Come with your idea for a final project</b></i>
11/5	Final Project Proposals <ul style="list-style-type: none"> <li>• Class discussion</li> </ul>	-----	<i><b>Final Project Proposal (submit electronically before class)</b></i>
11/12, 11/19	Independent work on final projects <ul style="list-style-type: none"> <li>• Instructors available in classroom for consultation</li> </ul>	-----	
11/26	<b>No Class – Thanksgiving Break</b>		
12/3	Project Oral Presentations	<ul style="list-style-type: none"> <li>* Gordon Bower's Talk-Giving Tips</li> <li>* K. H. Grobman, "How to give a good talk in Psychology or other Sciences"</li> <li>* Aunt Kathy's No-No's for Research Presentations</li> </ul>	
12/10	Project Oral Presentations Class Wrap-up	-----	

**Written Projects due Friday Dec. 12 at Noon**