PSYC/NEUR 385
Mind Reading: Understanding Functional Magnetic Resonance Imaging
Spring 2016

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Office hours: Tuesday, 3:00 – 4:30 pm, or by appointment

Class: 370 Olin-Rice Science Center; Tuesday and Thursday, 1:20 – 2:50 pm

Readings: A mix of book chapters, literature reviews, blogs, popular press articles, and empirical works from neuroscience, cognitive science, and psychology journals. All readings are available on the course Moodle site.

Course Description

Functional magnetic resonance imaging (fMRI) is a non-invasive technique used to provide indirect measures of neural activity in healthy (and unhealthy) humans. Although the technique has been readily available to researchers for about 20 years, its popularity and use has grown tremendously in the last 10, and we now see it influencing aspects of culture and society not traditionally based in biomedical research (e.g., law, politics, economics). This course will cover the mechanics of fMRI, evaluate its strengths and weaknesses, and explore recent applications that have received wide and sometimes controversial coverage. By the end of the course, students will understand essential components of the fMRI technique and be informed consumers of primary and secondary source reports involving brain imaging.

Grading

Grades will be derived from scores on (1) participation in class discussions; (2) commentaries; (3) quizzes; (4) two tests; and (5) leading a class discussion. An overview of each assessment is provided below; further detail about each will be given in class.

Participation in class discussions (10%) 
This course will be conducted as a seminar—each class will be spent discussing the assigned reading for that day. As such, your attendance in class is essential and your participation in discussions is expected. Please bring your own (printed or electronic) copy of the assigned reading to class each day.

Commentaries (30%) 
Students will write a 2-page maximum commentary (double spaced, 12-point font, 1-inch margins) on the reading assigned for each class. The 2-page maximum will be strictly enforced in that the instructor will not read beyond the second page. The first page of the commentary should be devoted to describing the main points of the reading; the second page should be devoted to evaluating the reading. Effective evaluations will relate the reading’s topic to another topic, such as one we have discussed in class, a paper referenced in the reading, a news event, popular press article, or some personal experience, and will exhibit thoughtful consideration and clear exposition. Commentaries are due via email by midnight the night before class. Commentaries turned in after that time will be penalized 5% (e.g., 85% becomes 80%) for each 12-hour period they are overdue.

Quizzes (25%) 
Unannounced quizzes will be given at the beginning of class at random throughout the semester. Quizzes will be brief, short-answer assessments of your understanding of the present and/or the previous day’s
topic. They are not intended to be particularly challenging; they are provided as impetus for you to keep on top of the readings and discussions. Make-up quizzes will not be given; however your lowest quiz score will be excluded from the calculation of your final score.

Tests (15% each = 30%)
Two tests will be given during the semester (see schedule below). Each will consist of short and long-answer questions pertaining to material covered in class so far.

Leading class discussion (5%)
During the last several weeks of the semester, each student will lead the class in discussion of an empirical article. Students will select an article that adheres to the criteria listed on the course Moodle site, and guide the class through discussion of the article’s important points on their assigned day.

Course Policies

Academic integrity
Academic integrity is a serious issue, and Macalester College has established guidelines for defining and reporting cases of cheating and plagiarism. These guidelines are stated in the Student Handbook (https://www.macalester.edu/studentaffairs/studenthandbook/03academicpolicies/03-05academicintegrity.html), and all students are expected to follow them. Cases of suspected academic dishonesty will be reported to the Dean of Academic Programs immediately.

Disability
I am committed to ensuring access to course content for all students, and reasonable accommodations will be made for students with documented disabilities. If you have a disability that will impact your work in this class, please contact the Office of Student Affairs (651-696-6220) to discuss your needs. The office will contact me, and we will work together to arrange the appropriate accommodations.

Incompletes
Macalester College strongly discourages assignment of incomplete grades, and no incompletes will be given except under dire circumstances and after consultation with the Dean of Academic Programs.

Schedule and Readings

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
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<tbody>
<tr>
<td>1/21/16</td>
<td>Introduction</td>
<td>Huettel et al. (2014) [Chapter 1, pages 1-16]</td>
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<tr>
<td>1/26/16</td>
<td>Overview of fMRI</td>
<td>Huettel et al. (2014) [Chapter 7, pages 223-225; 238-240; 243-264]</td>
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<td>1/28/16</td>
<td>BOLD signal</td>
<td>Huettel et al. (2014)</td>
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<td>2/2/16</td>
<td>Experimental design</td>
<td>Huettel et al. (2014) [Chapter 8, Box 8.1; Chapter 9]</td>
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<td>2/4/16</td>
<td>Statistical analysis</td>
<td>Huettel et al. (2014) [Chapter 10, pages 363-374; 388-400; 404-408] Bennett et al. (2009) Bennett et al. (2010)</td>
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<td>Date</td>
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<td>2/23/16</td>
<td>Functional connectivity</td>
<td>Buckner et al. (2013)</td>
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<td>3/1/16</td>
<td>Test 1</td>
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<td>3/3/16</td>
<td>Functional connectome</td>
<td>Finn et al. (2015)</td>
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<td>3/10/16</td>
<td>Lie detection</td>
<td>Farah et al. (2014) Ganis et al. (2011)</td>
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<td>3/12/16 – 3/20/16</td>
<td>Spring break</td>
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<td>3/24/16</td>
<td>Neuroethics</td>
<td>Hutcherson et al. (2015)</td>
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<td>4/5/16 – 4/7/16</td>
<td>CMRR visits</td>
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<td>4/12/16 – 4/21/16</td>
<td>Student presentations</td>
<td>TBA</td>
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<td>4/28/16</td>
<td>Test 2</td>
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Complete References


