Emotion, Cognition and the Brain
KHC HS101
Spring 2012
Tuesday/Thursday
11:00 AM - 12:30 PM
Room: SAR 417

Dr. Helen Barbas
Office hours: Monday 2:30-4:30 PM, Tuesday 12:45-1:45 PM Office location: 635 Commonwealth Ave., Room 431
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Course Description and Purpose

Cognition and emotion were classically thought to be represented separately in the brain but recent advances in brain research contradict this notion. Signals from brain pathways underlying emotion influence high-order brain association areas associated with cognition. In this seminar we will discuss evidence for the neural basis underlying the synthesis of cognition and emotion for decision and action, and dissociation of this process in several psychiatric diseases, including schizophrenia, autism and depression.

We will begin with the classic readings in the field and the roots of the issue in the context of evolution. Many (though not all) of the ideas in Darwin’s classic book on emotion are supported by recent findings in neuroscience, as discussed in the Introduction and in numerous notes by Ekman in the assigned 3rd edition of Darwin’s book (2009). This text lays the foundation for subsequent work, including research in key mental disorders, as exemplified in the other two texts. By the end of the seminar students should have knowledge on the origins and development of the concept of emotion and cognition in the brain, and the disruption of these processes in mental disorders. In the readings and class discussions, students will be exposed to the fundamental neural circuitry that underlies emotional and cognitive processing in the brain in primates. Visits to the Neural Systems Laboratory will show students methods used to study neural circuits.

Required Texts

4. Recommended supplementary text: The Human Brain Coloring Book (paperback), by Diamond, M.C., Scheibel, A.B., and Elson, L.M. 1985. Coloring the different parts of the brain will provide an understanding of the spatial relationship of structures referenced in the readings.

Articles
Assignments from literature, available on blackboard for the course, as listed below.

**In-class Presentations**

1. Point-counterpoint:
   For the in-class debate students will be placed in two groups, to debate one or an alternative position on a subject for which there is theoretical and/or experimental/clinical disagreement among experts. The first group will present a central tenet of position 1, and team two will be required to respond and offer an alternative view, and so on. Positions and points of debate will be based on readings from the scientific literature.

2. Final paper presentation:
   Presentation of the highlights of the main paper, and discussion.

Work on the paper and final presentation should be done independently. For the debates, students in each team should first read the material and then work together as a team to develop a strategy for the debate and crystallize the points they will present to the opposing team.

**Final Paper**

Choosing a topic:
Several famous figures showed characteristics suggesting problems along the cognition-emotion axis. From the group of thinkers/writers assigned to you, choose one for your paper. Based on your research of the literature, give an overview of the work of the individual, and focus on the behavior/personality of the thinker/scholar. Develop a central thesis on the aspect of cognition-emotion you think may have been affected, as inspired from readings for the course and modern neuroscience. Be sure to defend your thesis, which may differ from hypotheses found in the literature.

Paper length (text): 10 pages, double spaced, Times New Roman, 12 font, 1 inch margin, paginated at bottom right. List references (~15-20) at the end of the paper, starting with a new page, in the style of the journal Cerebral Cortex (see sample article in our readings on blackboard).

**Deadlines related to paper:**
Choice of topic: February 14, in class.
1 page summary of topic highlights and organization: Due, February 28, in class. Final paper: Due, April 12 (in class).

**Protagonists for paper:** Mathematicians/philosophers: Kurt Friedrich Gödel
Georg Cantor
Srinivasa Ramanuchan
John Nash
Literary figures/artists: Virginia Woolf, novelist Eugene O’Neill, playwright Sylvia Plath, poet, novelist Ernest Hemingway, novelist John Keats, poet

Attendance
Attendance in class is required

Academic Dishonesty
Boston University’s Academic Conduct Code (http://www.bu.edu/academics/resources/academic-conduct-code/) is designed to assist in the development of a supportive and productive learning environment. It is both a description of the University’s ethical expectations of students as well as a guarantee of students’ rights and responsibilities as members of a learning community. The Code provides clarity related to policy and procedure regarding academic conduct.

All students entering Boston University are expected to maintain high standards of academic honesty and integrity. It is the responsibility of every undergraduate student to be aware of the Academic Conduct Code’s contents and to abide by its provisions. The Academic Conduct Committee of the individual School or College, which is composed of students, faculty and staff, has jurisdiction over all charges of academic misconduct brought against students.

Grading
- Weekly overviews of assigned readings: 10%
- Class participation: 10%
- In-class debate: 10%
- Mid-term: 20%
- Final paper: 20%
- Final paper presentation: 10%
- Final exam: 20%

NOTE: All deadlines are final, exams will be given during class periods, and the final exam, which is cumulative, will be according to the university schedule; there will be no make-up exams.

Course Outline & Readings

Topics for class discussion are listed by week. Readings from the books will be listed for each week. Original articles will be posted on blackboard.
Weekly deadlines: Each week, students are required to post an overview of the coming week’s readings, due Sunday evening, by 11:55 p.m. The overviews/questions should be posted on the discussion board for the course for the appropriate week, which will be visible to all students in class. The overviews should provide the gist of each reading assignment, written in a concise paragraph for each reading, and uploaded as one file by each student. You may include questions and list points that need explanation, in addition to the paragraph for each reading. Students should read each other’s postings, starting on Monday each week, and be prepared to discuss the subject in class.

I. Introduction: The roots of beliefs that cognition and emotion are opposite and separate processes

Ideas on emotion and cognition from Aristotle of ancient Greece. Ideas from the French philosopher Rene Descartes (1596 – 1650) on dualism: Mind/non-material; body, material.

Influence of classical philosophy of mind/body separation on early cognitive psychology, as opposed to recent concepts from neuroscience.

**Week: Topic and Readings:**

Reading: Darwin, Expression., Ch. 1; and Preface to 3rd Edition, Ekman; and, Damasio, Ch. 11.

Reading: Darwin, chapters 2-3.

II. Challenge of some theories based on evidence from the organization of the brain

Linkage of pathways underlying thoughts and emotions in the brain – what the brain hardware tells us about the brain’s software.


Feb. 21 (Monday sch.)

Reading: Darwin, Ch. VII, IX; and, Brain activation during sight gags and language-dependent humor. Cerebral Cortex 17: 314-324, 2007 (on blackboard).


8: March 6, 8. March 6: Review of topics and discussions for weeks 1-8. March 8, test 1 (content of weeks 1-8). March 10-11: Spring recess

9: March 20, 22. The brain’s hardware for emotion and cognition – cont. Linkage of cortical and subcortical brain structures. Reading: Darwin, Ch. XII, XIII.

III. Consequences of separation of brain pathways for cognition and emotion in the brain: evidence from psychiatric and neurological diseases


13: April 17, 19 Student project presentations. Review of readings- weeks 1-8.

14: April 24, 26 Student project presentations. Review of readings – weeks 9-15.

15: May 1 Final course discussion. Summary of key concepts about emotion, cognition and the brain