

Speech and Hearing Science 250: BRAIN AND LANGUAGE

Course Syllabus

Winter Quarter 2004
Tuesday and Thursday 1:30-3:18

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Course Description

The study of normal language processing as well as the field of speech-language disorders has increasingly benefited from advances in brain imaging and functional MRI, along with the widespread availability of evoked potential/ABR methodologies. This course will explore how speech-language abilities (including speech production, speech perception, and memory) are instantiated and organized within the human brain. Of considerable interest will be the nature of hemispheric specialization for language (lateral dominance), discussions of whether there is a uniquely human language faculty in our brain, possible neural structure(s) of bilingualism, consequences (i.e., speech-language disorders) that result from damage to one or more areas of the brain and the effect on speech-language processing of age-related changes to neural structure.

Course Objectives

This course will introduce students to the brain mechanisms involved in the acquisition and use of language as well as with the nature of speech-language disorders when there are neurological problems. It is designed to explore the neurological basis of language in humans as well as other species. The students will become familiar with the nature of language as a human social behavior, how language is represented in the brain, and the linguistic consequences of injury to the brain. Specific objectives of the course will include:

1. To acquaint students with the general structure, function, and development of the central and peripheral nervous systems as it relates to speech and language.
2. To introduce students to the basic organization of language in the brain.
3. Provide an overview of neurological language disorders (including aphasia, traumatic brain injury, dementia, dyslexia and dysgraphia)

4. To familiarize students with the role of memory in language processing (and possible neural organization of memory).
5. To describe neurological organization of bilingualism.

Required Readings

There will be required textbook for the course: L.K. Obler & K. Gjerlow (1999), *Language and the Brain*, Cambridge University Press. There will also be a small set of additional readings for many topics in this course. These readings are designed to expand your appreciation of the topic (and many come from popular and very readable sources such as *Scientific American*). Copies of all readings will be made available on-line through the Ohio State Library's Electronic Reserves site (go to <http://www.lib.ohio-state.edu/> for access). To use the Electronic Reserves you will need to download a free copy of Adobe Reader (you will do this through the Library's website and through Ohio State's software-to-go site at <http://softwareto.go.osu.edu/>) which will allow you to retrieve copies of the readings to your home computer.

Links to Relevant Web Pages

The detailed course outline (below) also provides addresses to websites that provide relevant material and information on weekly topics—you should visit these sites during the week indicated. These website often present material in a manner not possible in the written text (e.g., pictorial tours through the brain) and should be valuable in understanding how language is organized in the brain. However, it is important to remember that no matter how valuable a resource a website seems to be, please always bear in mind that websites are not peer reviewed and the “articles” are not subject to the refereed acceptance procedure that journals commonly impose upon manuscript submissions. However, the world wide web has become an important source of information on a very wide variety of topics so it is reasonable to incorporate it into a class.

Grading:

A student may earn a total of 400 points in the course. Grades will be based upon two exams (midterm and final worth 150 points each) and a project/paper. The final grade will be assigned on a straight scale and will be computed according to the following breakdown:

Midterm (Feb 3):	150
Final:	150
Project/paper (Last week of class):	<u>100</u>
TOTAL	400

The final letter grade will be assigned according to the following scale: 93-100% A, 90-92% A-, 87-89% B+, 83-86% B, 80-82% B-, 77-79% C+, 73-76% C, 70-72% C-, 66-69% D+, 60-65% D, and 0-59% E. Final grade points containing decimals will be rounded to the closest integer (e.g., 89.49% → 89%, 89.50%→90%).

Midterm and Final: The format of both the midterm and final exams will include multiple-choice questions, diagram identification, matching, fill-in the blank and very short essay questions. The final exam will be held at the time specified by the University in the class schedule. Please note that there will be no changes to the final exam schedule unless there is a documented family emergency or medical emergency.

Project/paper: Topics for the project/paper are to be individually chosen, but must be relevant to the material being presented in class. Possible ideas for this assignment might include: a case presentation, a formal report (according to APA guidelines), or a book report (any book needs to be relevant and approved by the instructor). More details about the course project/paper will be provided during the second week of the course.

Academic misconduct

University administrators encourage all faculty members to incorporate into their course syllabus a reference to Ohio State's guidelines on academic misconduct. These guidelines require that "each instructor shall report to the Committee on Academic Misconduct all instances of what he/she believes to be academic misconduct." Details about what constitutes academic misconduct can be found in the Ohio State Student Handbook. Contact me if you have any questions. Note: Academic misconduct is a serious matter, with serious consequences. In your course paper make sure to cite references properly, especially direct quotations. Plagiarism (e.g., uncited use of material obtained from an internet site, article or book) is a serious offense as is giving or receiving information on an exam.

Alternative Format for Course Material

This publication/material is available in alternative formats upon request. Please contact me for the necessary arrangements. Students with disabilities are responsible for making their needs known to the instructor, and seeking available assistance, in a timely manner

Course Outline and Reading Assignments

Three class sessions will be devoted to each topic. Two of the class sessions will be lectures/presentations by the Guest Lecturer and the third class will be a class discussion organized and monitored by the Course Coordinator.

Week 1. Course introduction; nature of relationship between brain and language; difference between brain and "mind;" localizationism vs. connectionism; gross neural anatomy.

Required Readings:

Obler & Gjerlow, Chapters 1 and 2

Kolb and Whishaw (1996), Chapter 3 (Primer on neuroanatomy)

Web Links:

The Secret Life of the Brain: <http://www.pbs.org/wnet/brain/>

Week 2. Neural anatomy (continued), nature of language and brain organization for language.

Required Readings:

Obler & Gjerlow, Chapter 3

Web Links:

About Brain Injury: A Guide to Brain Anatomy <http://www.waiting.com/brainanatomy.html>

Dissection of the Human Brain:

<http://www.vh.org/adult/provider/anatomy/BrainAnatomy/BrainAnatomy.html>

Week 3. The basic nature of aphasia and the classification of syndromes (Broca's aphasia, Wernicke's aphasia, conduction aphasia, anomie aphasia, and subcortical aphasia).

Required Readings:

Obler & Gjerlow, Chapter 4

Web Links:

www.nih.gov/nidcd/aphasia.htm

<http://www.aphasia.org/NAAfactsheet.html>

Week 4. Explanations for the syndromes

Required Readings:

Obler & Gjerlow, Chapter 5

Web Links:

<http://ibis-birthdefects.org/start/sites.htm>

<http://specialchildren.about.com/cs/geneticssyndromes/>

Week 5. Childhood aphasia and other language disorders

Required Readings:

Obler & Gjerlow, Chapter 6

Web Links:

<http://www.kidsource.com/NICHCY/speech.html>

www.ldaamerica.org

Week 6. Right brain damage (traumatic brain injury)

Required Readings:

Obler & Gjerlow, Chapter 7

Web Links:

<http://www.neurologychannel.com/tbi/>

<http://www.neuroskills.com/index.html?main=tbi/brain.html>

Week 7. Dementia

Required Readings:

Obler & Gjerlow, Chapter 8

Web Links:

<http://www.alz.org/>

<http://www.nimh.nih.gov/publicat/index.cfm>

Week 8. Dyslexia and dysgraphia

Required Readings:

Obler & Gjerlow, Chapter 9

Web Links:

<http://www.dyslexia.com/>

http://www.audiblox2000.com/dyslexia_dyslexic/dyslexia.htm

Week 9. Bilingualism and brain organization

Required Readings:

Obler & Gjerlow, Chapter 10

Web Links:

<http://www.kidsource.com/ASHA/bilingual.html>

<http://www.ncela.gwu.edu/miscpubs/ncrcdsl/rr6/>

Week 10. Language organization, neurolinguistics, and the faculty of language (and evolution of language)

Required Readings:

Oblor & Gjerlow, Chapters 11 and 12

Hauser, M.D., Chomsky, N. and Fitch, W.T. (2002), The faculty of language: What is it, who has it, and how did it evolve? *Science*, **298**: 1569-1579.

Web Links:

<http://www.lsadc.org/web2/neurolinguistics.html>

<http://hebb.uoregon.edu/focus05/>

Week 11. Final Examination, Date/Time to be announced.

Course Project Due Monday, March 15th, of Finals Week by 4:00 p.m.