Language and the Brain – W 2440 – Spring 2004

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Course content: The course addresses two issues: (a) the psychological processes that underlie the comprehension and production of words and sentences, reading and writing; and (b) the organization of these processes in the brain. The course reviews the approaches adopted in language science to investigate various linguistic tasks and the experimental findings that are at the basis of current models of language processing. The performance of brain-damaged patients with deficits selectively affecting a given language function (e.g., oral naming or reading) are also considered. The analyses of these deficits help us to understand how language mechanisms are organized in the brain. To determine the brain regions related to language and meaning, some recent investigations make use of neuroimaging techniques such as positron emission tomography, functional magnetic imaging, and event-related potential. The relevance of neuroimaging data for psychological and neurological theories of language processing is discussed. The course also surveys topics related to language acquisition, reading deficits (dyslexias), the evolution of language, and bilingualism.

Classes: Classes consist of lectures. Between one and three classes are devoted to the discussion of a general topic (e.g., language production; reading). Following a general introduction of the topic, the discussion will focus on a specific issue and the relevant experimental evidence that has been provided to support a given account. For example, in discussing word meaning, it will be examined whether distinct brain regions are devoted to the processing of animate and inanimate concepts. During classes students will participate in several experiments.

Readings: The readings include: (a) chapters from the textbook (“Psycholinguistics,” Berko and Bernstein editors) and (b) articles from scientific journals and books. While the textbook offers an overview of the topics discussed in class, articles focus on specific issues and present a theoretical view or exemplify an approach for investigating an aspect of language. Students are expected to come to class having read the material assigned for class. Students can buy the reading package at Copy Quick. Copies of the reading are also available at the Psychology Library (Schermerhorn Hall rm 409).

Exams/Grading: There are two in-class exams – a midterm and a final. The midterm exam covers all the material assigned up to that point and contributes 40% to the final grade. The final exam covers the material from the entire semester, although it emphasizes the material presented in the second part of the semester. The final exam accounts for 60% of the final grade. Both exams include multiple choice and 2 essay questions.
01.20 **Overview of course topics**

**Approaches to the study of language processing** (Textbook Ch. 1 & 2)

01.22 The linguistic and psycholinguistic approach


01.27 Brain-damaged patients and neuroimaging techniques


**Speaking**: **From Meaning to word sound** (Textbook Ch. 4)

01.29 The relation between word forms and meaning

02.03 Category-specific deficits


02.05 Models of language production (Textbook Ch. 7)


02.10 Disturbances of language production – anomias


02.12 Word rules?


02.17 The retrieval of phonological information

**Language Comprehension**: **From word sound to meaning** (Textbook Ch. 3)

02.19 Phonetics


02.24 Word segmentation


02.26 Access of word meaning and the recognition of morphologically complex words
03.02 *Mid-term exam*

**Sentence Processing** (Textbook Ch. 5 & 6)

03.04 The syntactic structure of sentences and syntactic parsing


03.09 Agrammatism and the failure to process passive clauses

**Intermezzo: A science play**

03.11 Class review of a scientific study (paper to be assigned)

**The Evolution of Language**

03.23 The emergence of language


03.25 Language creation: Pidgin and Creole languages


**Language Acquisition** (Textbook Ch. 8)

03.30 Speech recognition in infants


04.01 Word acquisition


04.06 Early stages of sentence processing


04.08 A special vocabulary: Spatial terms


**Bilingualism** (Textbook Ch. 10)

04.13 Language organization in bilinguals

04.15 Bilinguals’ brains

Reading (Textbook Ch. 9)

04.20 Early stages of word reading and “peripheral” dyslexias

04.22 Access to word meaning and word sounds and “central” dyslexias

04.27 Where are reading processes in the brain?

Writing

04.29 Writing deficits: Implications for models of normal writing