Syllabus

Week 1 - September 11, 2006

Session 1

Topic: SYLLABUS

Class Plan:

PSYC W3265 Auditory Perception Fall 2006
Dr. Sarah M. N. Woolley
Office: 317 Schermerhorn Hall
Office Hours: Mondays 4-5
Email: sw2277@columbia.edu

Introduction

How does the human brain make sense of the acoustic world? What properties of sound are important for the discrimination and recognition of sounds with specific meaning? What aspects of auditory perception do humans share with other animals? How does the brain perform the computations necessary for skills such as sound localization? How do we focus our auditory attention on one voice in a crowd? What acoustic cues are important for speech perception? What's special about music? We will address these questions and more by studying the basics of auditory perception in a textbook, and reading classic and current literature to understand the scientific progress in the field today. Our reading of the literature will be critical, with a focus on good scientific design.

This course will systematically review the main topics of auditory perception such as: 1) the physics of sound; 2) the anatomy and physiological functioning of the auditory system; 3) perception of loudness; 4) frequency selectivity and discrimination; 5) perceptual phenomena such as forward and backward masking; 6) temporal processing; 7) pitch and timbre perception in simple and complex sounds; 8) auditory attention; 9) scene analysis; 10) speech and music perception. We will examine the current literature on such topics as sound localization in humans and other animals, how the brain forms a map of auditory space, acoustic communication in humans, birds and other mammals, and how the brain may be specialized to encode the unique communication sounds of individual species. We will analyze the studies demonstrating categorical perception and lateralization of the brain for language processing. And we will study how people perceive and process music.

The reading list and weekly schedule


Week 1 – Sept 11

The physical properties of sound, the ear, and the auditory system

Reading

Moore, chapter 1

Students select presentation topics this week

Week 2 – Sept 18

Sound Intensity and Loudness Perception
Presenters: Adam, Nick, Rahul

Reading

Moore, chapters 2 and 4


Week 3 – Sept 25
Frequency Selectivity, Discrimination
Presenters: Mike and Darcy

Reading
Moore, chapter 3 and 6 (sections 1-3)


Week 4 – Oct 2
Temporal Information and Processing, Masking
Presenters: David and Nick

Reading
Moore, chapter 5


Week 5 – Oct 9
Sound Localization
Presenters: Katie and Kibby

Reading
Moore, chapter 7


Week 6 – Oct 16
Society for Neuroscience Meeting – no class

Week 7 – Oct 23
Midterm Exam

Week 8 – Oct 30
Auditory Attention
Presenters: Jen and Hal

Reading


Week 9 – Nov 6
Academic Holiday
**Week 10 – Nov 13**

**Complex Sounds, Streaming and Scene Analysis**

Presenters: David and Jen

**Reading**

Moore, chapters 6 and 8


**Week 11 – Nov 20**

**Speech and Categorical Perception**

Presenters: Rachael and Kim

**Reading**

Moore, chapter 9


**Week 12 – Nov 27**

**Neural Basis of Speech Perception**

Presenters: Rachael and Adam

**Reading**


**Week 13 – Dec 4**

**Communication in nonhuman animals**

Presenters: Tara and Mike

**Reading**


**Week 14 – Dec 11**

Presenters: Hal and Joe
Music Perception

Reading


Course requirements
Each week, students will attend a two-hour seminar. Class time will be devoted to the presentation and discussion of book chapters and journal articles. The reading is intended to provide background knowledge on the relevant topics, to cover the current and most exciting research on those topics, and to serve as a stimulus for discussion. Two students sign up to lead the discussion each week.

The students take a written midterm exam with essay questions covering the material in the textbook, the papers and the class discussions. During the second half of the semester, the students write a term paper due on the Monday of Reading Week. The 10-15 page paper should take the form of a critical review paper that addresses a specific question related to the topics of the seminar.

Grading is allocated as follows:

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm exam</td>
<td>20%</td>
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<tr>
<td>Term paper</td>
<td>30%</td>
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<tr>
<td>Participation and Presentations</td>
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