

Speech Perception

185:412:01 Advanced Topics II: Speech Perception

Meets: Monday and Thursday 12:10-1:30pm in BE-111 (Livingston Campus)

Prereqs: 01:185:201 Cognitive Science: A Multidisciplinary Introduction

Instructor: Ryan Rhodes (ryan.rhodes@rutgers.edu)

Office Hours: TBA

Course Site: Canvas

Course Materials

This course has no textbook. We will be reading scientific articles published in peer-reviewed journals, which will be available on canvas.

All relevant materials can be found on the course canvas site (see above).

Course Description

Linguistic communication is the act of transmitting information from one mind to another. This is a highly complex encoding, transmission, and decoding process. In this class, we will focus on one part of this process—the perception of speech. That is, how the complex, messy, multidimensional speech signal is decoded and mapped to symbolic linguistic mental representations which can be used to reconstruct the source of the speech signal—another person’s thoughts.

This course is discussion-based, and we will be reading and discussing primary scientific literature.

Course Learning Outcomes

This course has two primary goals. Reading and understanding primary scientific literature is challenging. A primary objective of this course is to develop the skill of reading scientific papers, extracting meaningful information, and integrating that new information with our prior knowledge. We will be viewing this literature with a critical lens to better understand scientific reasoning as it is applied to very difficult questions.

The other goal of this course is to develop a deep understanding of speech perception, viewed through a framework informed by theoretical linguistics, cognitive psychology, and neuroscience. We will adopt a “levels of analysis” approach – common in cognitive science – to understand the perception and decoding of speech as part of a complex information processing system.

Assignments

Reading Journal: 10%

Due: Thursday, in class.

You will be required to keep a journal, where you will make notes about the readings. Bring your journal to class and show me your entry for that week’s reading to receive credit.

The journal is important because it gives you well-structured notes to reference for discussion and reading responses. Please bring it to class!

Reading Responses: 30%

Due: Sunday (5pm).

Each week there will be a paper on the week’s reading (500-1000 words). These must be submitted to Canvas. The purpose of the response is to get you thinking about the readings, connecting the new material to other readings and discussion, and offering your own thoughts.

There will be 12 reading responses total. The highest 10 will be counted towards your final grade.

Responses will be graded according to the following rubric:

Great 3	Proficient 2	Developing 1	Unsatisfactory 0
The response is well-developed. It indicates that the material was read and understood. It expands on, elaborates, or offers a unique insight on the material.	The response is adequate. There is evidence that the material was read and understood. Elaboration or unique insights may be less developed.	The response is not adequate. There may be little evidence that the material was read or understood. There is no elaboration.	The response was not submitted properly to Canvas by the deadline.

Critical Review Paper: 30%

Due: Nov 5.

As a midterm assignment, you will write a critical review of a scientific article. This will be a longer paper in which you will evaluate the scientific merit of a paper according to guidelines for journal reviewers.

I want you to think critically about the paper – does it have a well-articulated model that predicts the experimental outcomes? Are the tools used appropriately for what is being measured? Are there any unstated assumptions in the author’s explanations or discussion? Is the writing clear?

Research Proposal: 30%

Draft: Dec 3.

Final Paper: Dec 15.

Your final project will be a longer paper in which you propose an idea for an experiment or a research project related to speech perception. Ideally, your proposal should relate to the topics and framing that we have discussed in class and engage meaningfully with perceptual and linguistic theories.

Your proposal should include a brief review of some relevant literature, a proposed study design, and some discussion about expected results. A first draft will be due on Dec 3. I will read your draft and give you feedback and ideas. The final paper will be due Dec 15 (during finals week). The first draft will be worth 10% of your total course grade, and the finished paper will be worth 20% (30% total).

Schedule

Date	Topic	Reading	Assignment Due
9/7	Overview	TBD	
9/11	Problems and	TBD	
9/14	Theories		
9/18	Categorical	McMurray (2022)	
9/21	Perception		
9/25	Representations	Phillips et al.	
9/28		(2000)	

10/2	Language	Sharma & Dorman
10/5	Knowledge	(1999)
10/9	Under-	Eulitz & Lahiri
10/12	specification	(2004)
10/16	Bilingualism	Gonzalez & Lotto
10/19		(2013)
10/23	Learning	Barrios et al.
10/26		(2016)
10/30	Auditory Cortex	Khoshkoo et al.
11/2		(2018)
11/6	Normalization	Sjerps et al. (2019)
11/9		
11/13	Gradience	McMurray et al.
11/16		(2009)
11/20	Scene Analysis	Mesgarani &
11/21		Chang (2012)
11/27	Multimodal	Ostrand et al.
11/30	Integration	(2016)
12/4	Context	Stilp (2019)
12/7		
12/11		

Class Policies

Attendance

This is a discussion-based class, so it is very important that you come every week. You'll show me your reading journal entry on class day – if you don't show up, you won't get credit for your journal!

If you have to miss class for any reason, please email me or come to office hours to find out what you missed.

Collaboration

Collaboration is at the heart of good science! I encourage you to collaborate with each other - but every student must always turn in their own work. Your work must be written solely by you!

Academic Integrity

Cheating or plagiarism of any kind will not be tolerated. University policies on academic dishonesty are draconian – please don't put me in a position where I have to enforce

them. If you are not familiar with Rutgers's academic integrity policies, you can find them here: <http://academicintegrity.rutgers.edu/academic-integrity-policy/>.

Accommodation of Disabilities

Please let me know if you need any kind of accommodations. You can also contact ODS here: <https://ods.rutgers.edu/students/registering-for-services>