

LING 492
Reverse Engineering the Human Language Faculty
Fall 2021

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Course at a glance

- **Time** Mondays and Wednesdays from 1-2 pm
 - **Location** 180 TAP
 - **Website** Via Canvas
 - **Email** jobrenn@umich.edu
 - **Office Hours (virtual)** Weds 2-4:30pm via zoom (Click here for appt)
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Overview

Course Description

This course addresses the cognitive processes involved in language and conversation with a focus on mistakes, breakdowns, and language-related pathologies. Through this lens we aim to “reverse engineer” the cognitive faculty of language. Students will learn what is known (and what is still unknown) about how language is processed. We will use these topics to learn about the relationship between theories and hypotheses in cognitive science, and to explore a variety of state-of-the-art methods in the cognitive science of language.

Student Well-being

Students may experience stressors that can impact both their academic experience and their personal well-being. In addition to disruptions from the ongoing COVID-19 pandemic, these may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc.

If you are experiencing concerns, **seeking help is a courageous thing to do for yourself and those who care about you.** If the source of your stressors is academic, please contact me so that we can find solutions together. For personal concerns, U-M offers many resources, some of which are listed at Resources for Student Well-being on the Well-being for U-M Students website. You can also search for additional resources on that website.

Accommodations

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate academic accommodations. SSD (734-763-3000; <http://www.ssd.umich.edu>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

Expectations

To do well in this course you need to *participate thoughtfully* in class discussions and *engage with writing* on various topics throughout the term.

Writing engagement takes the form of a series of short to mid-length writing assignments. It is important to stay current with these assignments, as they build

on each other from week-to-week. Participation comes in the form of in-class discussions and group work. Students are expected to come to class having done the readings and assigned activities so they can be active participants.

Assignments & Grading

All course readings are available via Canvas

Readings, Activities & RQs (20%)

There will be weekly readings and/or out-of-class activities.

Readings will come from journal articles, websites, or other sources. All readings will be made available via Canvas under *Files*.

Activities and Reading Questions (RQs) for each reading or activity will be posted on Canvas under *Assignments*. These may be multiple choice, true/false, or short answer questions. Simply doing the assignment will count for 50% of your RQ grade and the quality of your answers counts for the remainder. (For example, if you answer one RQ question out of three incorrectly, then you receive a 83% for that assignment.)

RQ responses should be submitted no later than 11am on the date indicated on the syllabus.

There is a 1 week grace period for RQ submissions. Up to three RQs can be missed without penalty.

Write-ups (50%)

You will complete a series of longer write-ups over the semester. These reports will each have multiple stages allowing you the opportunity to revise and refine your work as you practice skills such as:

- Writing up an experimental report
- Connecting evidence with competing hypotheses
- Reconciling conflicting experimental results

Submissions can be either Microsoft Word (.docx), Google Docs, or PDF files. (Note: Please make sure to ensure that your file can be opened; corrupted files that cannot be opened will not receive credit.)

There is a one day grace period on all write-up submissions. Because the write-ups build on each other, there is not a blanket policy for missed submissions. However, if you are concerned, please speak to the instructor about possible options for flexibility.

Multi-media “Science minute” (20%)

Your final assignment for the course will be to complete a *video presentation*. In the video you will present one “big idea” from the course. Your presentation will explain the idea for a non-expert viewer, and provide some of the key evidence behind the idea. As with the write-ups, this project has several milestones and opportunities for feedback as you refine your work.

Think of this as an entry in a YouTube series called “Science Minute”. Feel free to be creative! Simply talking to the camera can work quite well, but you can also free free to explore other visual/media tools that you think will make for an effective presentation.

The final video should be about three to five minutes long.

(Note: you are responsible for ensuring that your media file can be opened and viewed. Corrupted files that cannot be opened will not receive credit.)

Participation (10%)

All students are expected to complete the readings before class and to actively contribute to class discussions. A forum on Canvas is maintained for students to post questions and comments about the assignments and to continue the discussion outside of the classroom. Students are encouraged to post to the forum and to respond to posts by your fellow students.

Two class meetings can be missed without penalty. No documentation is required under this policy. Absences due to representing the university in an official capacity, or due to conflicts with religious holidays, are accommodated without penalty so long as appropriate documentation is provided. More details are available by the Newnan Academic Advising Center.

Excused absences that go beyond the above allowances can be made up by posting a reading response on the discussion board. Posts should:

- Be at least 150 words long
- Includes *questions* and/or *comments* that relate the reading to topics from previous classes and readings

Late Work Policy

- **RQs:** There is a grace period of 1 week on RQs
- **Write-ups:** There is a grace period of 1 day on write-ups. Later submissions must be cleared with the instructor.
- **Science Minutes:** Milestones will follow the same policy at write-ups; the final draft (due at the end of the term) will not be accepted if late.

Grading Scale

| | A | B | C | D | F |
|---|-------|-------|-------|-------|-----|
| + | 97-99 | 87-89 | 77-79 | 67-69 | |
| | 94-96 | 84-86 | 74-76 | 64-67 | <60 |
| - | 90-93 | 80-83 | 70-73 | 60-63 | |

Schedule

The schedule may change during the term. Be sure to check Canvas for updates!

Unit 1: Speech errors and the levels of linguistic representation

Aug 30

- **Topic** *Why computer's aren't going to take over the world any time soon*

Sep 1

- **Topic** *The mistakes that talking computers make*
- **Do** Computer language activity and RQ1

Sep 6

- **No Class** Labor day

Sep 8

- **Topic** *Speech errors and the stages of speech production*
- **Read** Traxler 2012 selection
- **Do** Speech error activity and RQ2

Sep 13

- **Topic** *What's gone wrong when something is "on the tip of your tongue"?*
- **Read** Aschcraft 1993's remarkable personal testimony of a speech production disorder
- **Do** RQ3

Unit 2: Aphasia and mental structure

Sep 15

- **Topic** *Broca's brain and the origin of modern cognitive neuroscience*
- **Read** Geschwind 1972 on aphasia
- **Do** RQ4
- **Do** Schedule an office hours appointment with the instructor

Sep 20

- **Topic** *Tools and techniques in studying aphasias*
- **Read** This website about MRI
- **Do** RQ5
- **WRITE-UP 1: Speech errors first draft** Due Sep 20

Sep 22

- **Topic** *Aphasia treatments and the line between cognitive and motoric processing*
- **Watch** The following sequence of youtube videos tracking recovery from Broca's Aphasia: 2 years, 3 years, 5 years, 7 years
- **Optionally read** Buchwald et al. 2017 on remediating targetting specific sub-deficits
- **Do** RQ6

Sep 27

- **Topic** *Auditory agnosia, Pure word deafness, and the "specialness" of speech*
- **Optionally read** Polster & Rose 1998
- **No RQ**

Sep 29

- **Topic** *Broca's aphasia and the importance of syntactic structure*
- **Read** Caramazza & Zurif 1976 on syntactic comprehension deficits in Broca's aphasia
- **Do** RQ8
- **WRITE-UP 2: Speech errors final draft**

Oct 4

- **Topic** *Wernicke's aphasia and the nature of lexical access*
- **Read** Milberg & Blumstein 1981 on semantic priming in aphasia
- **Do** RQ9

Unit 3: Agnosia and the nature of concepts

Oct 6

- **Topic** *The remarkable specificity of Agnosia*
- **Read** Warrington & Shallice 1984's report of category-specific deficits
- **Do** RQ10

Oct 11

- **Topic** *The “it takes a village” theory of conceptual knowledge*
- **Read** Pulvermuller et al. 2005’s experiment testing whether stimulating the brain’s “motor system” affects language comprehension
- No RQ but this reading is important for *write-up 3*

Oct 13

- **Topic** *Mirror neurons might help to explain how meaning works, and they also do dishes*
- **Read** Rizzolatti & Arbib 1998 review the brain’s mirror system
- **Do** RQ12

Oct 18: **BREAK**

Oct 20

- **Topic** *Too good to to be true? The evidence against strongly embodied theories of cognition*
- **Read:** Hickok 2013’s arguments against mirror neurons and an embodied theory of cognition
- **Do** RQ13
- **WRITE-UP 3: A theory of conceptual representations** Due Oct 20

Unit 4: Aging and meaning

Oct 25

- **Topic** *Semantic dementia and the one region to bind concepts together*
- **Read** Patterson et al. 2007’s review of semantic dementia
- **Do** RQ14

Oct 27

- **Topic** *Inducing semantic dementia in the comfort of your own lab*
- **Optionally read** Pobric et al. 2007 on inducing semantic deficits with brain stimulation
- No RQ

Unit 5: What does it mean to “lose” a language?

Nov 1

- **Topic** *Dementia and language change over the life-span*
- **Listen** to this *Radiolab* podcast (16 minutes)
- **Do** RQ16
- ~~**WRITE-UP 4: Comparing conceptual representations** due Nov 1~~

Nov 3

- **Topic** *Losing a language? Aphasia and multilingualism*
- **Read** Silverberg & Gordon 1979's case studies of bilingual aphasias
- **Do** RQ17

Nov 8

- **Topic** *The curious case of the woman who forgot which language she was speaking*
- **Optionally read** Abutalebi et al. 2000
- No RQ

Nov 10

- **Topic** *The benefits of multilingualism and the ill-understood notion of "cognitive reserve"*
- **Read** Woumans et al. 2015 on the possibility that multilingualism may delay the onset of cognitive impairment in old age
- **Do** RQ19
- **WRITE-UP 4/5: Final draft on competing theories of meaning** soft deadline Nov 10

Unit 6: Developmental disorders and the modularity of language

Nov 15

- **Topic** *Williams syndrome and the cognitive modularity of language acquisition*
- **Read** the New York Times on "The Gregarious Brain"
- **Do** RQ20

Nov 17

- **Topic** *Specific language impairments in development*
- **Read both** Joanisse & Seidenberg (1998) and Gopnik (1997) on different theories of SLI
- No RQ
- **SCIENCE MINUTE Script soft deadline** Nov 19

Nov 22

- **Topic** *(S)LI and the search for the "language gene"*
- **Read** Marcus (2003) on clues to the genetics of language from LI
- **Do** RQ22

Nov 25 **BREAK**

Nov 29

- **Topic** *The complicated connection between language processing and Autism Spectrum Disorders*
- **Watch** This short video giving a general perspective on ASD
- **Optionally read** this brief NIH overview of communication in ASD
- **Do** RQ23

Dec 1

- **Topic** *ASD: Linking social function and language*
- **Optionally watch** this video about methods to study looking patterns in children to assess word learning
- No RQ
- **SCIENCE MINUTE rough draft is due** Dec 1

Dec 6

- **Topic** *The growing understanding of the relationship between ASD and (S)LI*
- **No reading**
- No RQ

Dec 8

- **Topic** *Lingering issues & wrap-up*
- **No reading**
- No RQ

There is no final examination for this course. The final **Science Minute** video is due on **Wednesday Dec 15th**.

Further information

COVID-19 and a Classroom Culture of Care

Your health and safety matters. To minimize the spread of COVID-19 please follow the guidelines laid out in the Wolverine Culture of Care and the University's Face Covering Policy for COVID-19. If you would like to request an accommodation related to the face covering requirement under the Americans with Disabilities Act, you should contact the Office for Institutional Equity.

All students are expected to adhere to the required safety measures and guidelines of the State of Michigan and the University of Michigan, including sanitizing their work areas, maintaining appropriate personal distance, wearing a face covering that covers the mouth and nose in all public spaces, and not coming to class when ill or in quarantine.

Any student who is not able to comply with campus safety measures for this course should contact the course instructor *prior to class* to discuss alternate participation. They may also choose to meet with an academic advisor and consider other course options. Students who do not adhere to these safety measures while in a face-to-face class setting, and do not have an approved exception or accommodation, will be asked to participate on a remote basis.

For additional information refer to the LSA Student Commitment to the Wolverine Culture of Care and the OSCR Addendum to the Statement of Student Rights and Responsibilities on the OSCR website.

Course Recordings

Course lectures may be audio/video recorded and made available to other students in this course. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact the instructor the first week of class (or as soon as you enroll in the course, whichever is latest) to discuss alternative arrangements.

Email Policy

The best place to ask questions is via the Canvas Forum where the instructor and fellow students may all engage with the question.

Posting your questions on the forum allows for easy follow-up discussion and makes your contribution available to other students who may have similar questions. The instructors will monitor the forum to ensure answers are clear and accurate.

E-mail should only be used for personal concerns that cannot be addressed via the discussion board, in person before/after class, or in office hours. The instructor aims to respond to emails within 24 hours on weekdays. We are not available on email after business hours or on weekends.

A note on Academic Misconduct

The University of Michigan community functions best when its members treat one another with honesty, fairness, respect, and trust. The college promotes the assumption of personal responsibility and integrity, and prohibits all forms of academic dishonesty and misconduct. All cases of academic misconduct will be referred to the LSA Office of the Assistant Dean for Undergraduate Education. Being found responsible for academic misconduct will usually result in a grade sanction, in addition to any sanction from the college. For more information, including examples of behaviors that are considered academic misconduct and potential sanctions, please see <lsa.umich.edu/lsa/academics/academic-integrity.html>.