

LING 580

Language input, brain structure & function, and language ability

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Classroom: Savery Hall (SAV) 164

Meeting Time: Wednesday, 3:30-5:50

Course web page: <https://canvas.uw.edu/courses/1356398>

Course description:

This seminar explores the relationship between language input, brain structure and function, and language ability. We will adopt an interdisciplinary approach to study the effects of language input from a variety of perspectives, relating linguistics to cognitive science, psychology, neuroscience, and education. Among other topics, students will learn about the effects of social deprivation, international adoption and institutionalized care (orphanages) on language and brain development; bilingualism and multilingualism in early childhood; the effects of socioeconomic status on language learning and brain growth; early language learning from screen media and the effects of screen media on brain growth and language processing.

Basic knowledge of linguistics is assumed. However, detailed knowledge of brain structure and function is not necessary. The course will begin by covering these basics, as well as the basics of modern methodologies to study the human brain, with a developmental emphasis.

As you will notice below, one of the objectives of this course is to prepare students to lead academic discussions. As such, each student will sign up to be the designated discussion leader for one class (details under “Requirements” and “Evaluation”). While I have prepared a “Suggested Readings” list for each week, the designated student discussion leader will have a chance to revise and modify this list, and each weeks’ final readings list will be confirmed in class, a week ahead of time.

Learning objectives:

- Critically evaluate and present original research data, as well as theoretical perspectives. Prepare and lead academic discussion.
- Relate linguistics to other disciplines, such as cognitive science, psychology, neuroscience, and education. Identify tangible connections to real world problems.

Readings:

Readings will consist of journal articles (original research papers, review papers, or theoretical perspectives) and book chapters. In addition, for most weeks, I have suggested “additional resources”, such as videos, TED talks, or online modules relevant to the topic. The purpose of these resources is to equip students with some background knowledge, and/or to identify relevant connections to real world problems and issues. The student discussion leader will decide whether or not these resources are required or optional for each week. The student discussion leader is also welcome to identify and suggest other relevant web resources. All readings will be uploaded to Canvas, approximately 6 days before each class (i.e. by Thursday night each week for the following week).

Student Responsibilities and Expectations:

This course is based on active learning principles. Research on learning in higher education consistently demonstrates that students learn more when they have opportunities to actively engage in course content (Baepler & Walker 2014, Brooks 2012, 2011). These authors demonstrate that participation in an Active Learning Classroom contributed significantly to student learning outcomes and to students' positive perceptions of their learning experiences. To understand what this means and how it will work, please read the "Requirements" and "Evaluation" sections below.

Requirements:

(1) Participation: 30%

For each class (starting in Week 2, and excluding Week 6), you can earn up to 10 participation points (5 points for the **Discussion Guide** and 5 points for **In-Class Participation**). To receive full participation credit, I expect you to:

- Complete all assigned readings ahead of time;
- Submit a **Discussion Guide** for each class (5 points per class).

The **Discussion Guide** should not exceed one page, and should include a brief summary of each reading, bullet points for discussion, questions you have, ways to connect the readings to each other, to previous weeks, or to real world problems. Please note that discussion points or questions that are a direct repetition of ideas from the class handout (see below) will not be counted as your own work, and will therefore receive 0 credit. Discussion Guides are designed to facilitate discussion, therefore you must be present to receive credit (e.g. discussion guides turned in when students are absent from class will receive a score of zero). A paper copy of your Discussion Guide should be handed in to me **in person**, at the beginning of each class (make sure you keep a copy for yourself, to allow you to participate in class). Here is the grading rubric for the Discussion Guide:

Criteria	Ratings			Pts
All readings appropriately summarized.	Yes! 2 points	More than half of the readings appropriately summarized. 1 point	Less than half of the readings appropriately Summarized. 0 points	2
At least 3 in-depth questions or discussion points per readings identified.	Yes! 2 points	More than half of the in-depth questions or discussion points per readings identified. 1 point	Less than half of the in-depth questions or discussion points per readings identified. 0 points	2
Connections made to other readings, to previous weeks' materials and/or to real world problems.	Yes! 0.5 points		No. 0 points	0.5

Formatting clean, document does not exceed one page (single spaced, 12 point standard font and standard margins).	Yes! 0.5 points		No. 0 points	0.5
TOTAL				5

In-Class Participation: For full credit, I expect you to make rich and significant contributions to our classroom discussion and activities (5 points per class). This means demonstrating an understanding of the readings, referencing the texts (rather than solely discussing personal experiences), building on others' comments and asking insightful questions that further the conversation. Please note that you will not earn full credit if you dominate the discussion and prevent other voices from being heard.

There are a total of 7 classes where you will be graded for participation (no participation grading will be done in Week 1, Week 6, and in the week when you are the discussion leader). I understand that you will inevitably be exposed to a range of germs and illness, in addition to other issues that may come up during the quarter. Thus, the lowest participation grade for one class will be dropped. Use this on days when you are ill, or are unable to attend class. This means that there is a maximum of 60 points available for participation in total.

(2) In-class presentation / discussion: 30%

In Week 1, each of you will sign up to be the discussion leader for one class. You will be assessed based on the quality of your **In-Class Presentation/Discussion** (20%), and based on the class **Handout** that you will briefly present to your classmates one week before your scheduled presentation (10%). After you present this handout in class the week before your scheduled in class presentation / discussion, I will distribute it to your classmates and/or post it on Canvas, so that your classmates can use it to prepare for the class you will lead. **The handout** should be about 1 page in length, and it should be **emailed to me before class**, by 8 am on the day that you will present the handout (that is, the week before your scheduled in-class presentation / discussion). Your handout should include the following items:

- Final list of assigned readings: you can choose to keep the readings that I suggested, or change them. 2-3 readings should be selected per class. The requirements are that all readings are related to the weekly topic and to language input, that at least one is an original research paper (as opposed to a review paper or a theoretical perspective paper; please note that an exception to this rule can be made in Weeks 2 and 3, because we will be covering the basics, so more chapters and review papers are ok – when in doubt, ask me about your choices ahead of time), and that they are recent (published in the year 2000 or later). If you are having a hard time identifying relevant readings that fit these criteria, please contact me, but do so well *ahead of time* (at least 5 business days before your class handout is due).
- Between 3 and 6 learning objectives for the class: These should range from simple (define, outline) to more complex (synthesize, argue, relate, compare and contrast), and should relate the topic to other weekly topics and/or real world problems, or other disciplines. They should have an interdisciplinary perspective. Please note that these are the overarching goals for the class, or take-away messages that you think your classmates should be able to understand, defend, and discuss at the academic level at the end of the class.

- 3-5 in-depth questions or discussion points per reading.
- Additional materials, such as online videos, lay-audience articles or materials on the topic, TED talks etc.

Please note that your handout will be used by your fellow students in preparation for your presentation / discussion. For this reason, it will not be possible to turn it in late (i.e. you will receive 0 credit for the handout if you do not present it to your classmates the week before, and/or if I do not receive a hard copy and an electronic copy of it 1 week ahead of your scheduled presentation / discussion). Please contact me ahead of time if an emergency arises and you cannot be present in class to present the handout. Below is the grading rubric for the handout:

Criteria	Ratings			Pts
3-6 learning objectives identified; appropriate complexity and based on the readings.	Yes! 2 points	More than half of the learning objectives are of appropriate complexity and/or based on the readings. 1 point	Less than half of the learning objectives are of appropriate complexity and/or based on the readings. 0 points	2
3-5 discussion points or questions per reading identified. Relevant to reading and weekly topic.	Yes! 2 points	More than half of the discussion points or questions per reading identified and/or relevant to readings and weekly topic. 1 point	Less than half of the discussion points or questions per reading identified and/or relevant to readings and weekly topic. 0 points	2
Additional materials identified. Content relevant.	Yes! 1 point	Some additional materials identified, but content not always relevant to class. 0.5 points	Additional materials not identified and/or content irrelevant. 0 points	1
Final readings list listed. PDFs of readings emailed to me 1 week before scheduled presentation / discussion.	Yes! 1 point	Final readings selected, and more than half of selection criteria satisfied; or not all PDFs emailed to me on time. 0.5 points	Final readings not selected, or less than half of selection criteria satisfied. 0 points	1

In class presentation of handout: gives a clear idea about what will be covered in next week's class. Shows familiarity with next week's readings and enthusiasm for the topic.	Yes! 2 points	Idea about what will be covered in next class somewhat clear; presenter shows some familiarity and enthusiasm for next week's reading. 1 point	Instructions on how to prepare for next class not clear; presenter not familiar with readings and does not show enthusiasm. 0 points	2
				8 points

Your **In-Class Presentation/Discussion**. Please note that, while this is your time to shine, the format should be discussion based. You need to be familiar with the content of the readings, and I do encourage you to present the main points, but your main job is to guide your classmates' discussion, not lecture them. You are welcome to structure your presentation/discussion in any way that you believe is most conducive to learning, and use any (or no) technologies. If you are using technology, please be sure to know how to work with them in the classroom. If you have questions about the content of your presentation, or if there are things that you do not understand about the content that you are scheduled to present, you are welcome to ask me questions, but you should do so before your handout guide is due.

Below is the grading rubric that I will use to assess your in class presentation/discussion (please note the last point – this is your chance to reflect on your own presentation practices):

Criteria	Ratings			Pts
Is the presenter well prepared and shows in-depth understanding of material?	Yes! 2 points	More than half of the material is well understood by presenter. 1 point	More than half of the material is well understood by presenter. 0 points	2
The presentation / discussion is well organized, and all learning objectives are covered.	Yes! 2 points	More than half of the learning objectives are covered, presentation / discussion somewhat well organized. 1 point	Less than half of the learning objectives are covered, major issues with presentation / discussion organization . 0 points	2
Time management: All content covered in	Yes! 1 point	Most content covered in allotted time. 0.5 points	Major content points not covered in allotted time.	1

allotted time: 90 minutes with one break of ~10 minutes			0 points	
Is the discussion engaging?	Yes! 2 points	Discussion somewhat engaging. 1 point	Most of discussion not engaging. 0 points	2
Presenter relates subject matter to content from previous weeks, and/or real life issues related to topic.	Yes! 1 point	Some connections made with content from previous weeks or real life issues. 0.5 points	No connections made with content from previous weeks or real life issues. 0 points	1
Presenter invites and encourages all to participate.	Yes! 1 point	Encourages and invites most, but not all students to participate. 0.5 points	Most students not invited or entourage to participate. 0 points	1
Presenter fills out their own grading rubric (this table) and emails it to me by 8 am the day after the presentation.	Yes! 1 point	Grading rubric filled out in full, but sent to me late. 0.5 points	Grading rubric not filled out and emailed to me more than 3 days after presentation. 0 points	1
				10 points

(3) Final project*: 40% (15% for Week 6 outline and in-class presentation, 25% for final paper.

Students taking this course for 2 credits do not have to complete this assignment. They should still attend Week 6 presentations. Their grade will be based on their in-class presentation (50%) and participation (50%))

As a final project for this class, you will propose a research study related to the study of language input. The proposal can be a follow-up study to a research question discussed in class, or you can come up with a completely new question. You may try to come up with a project that you can actually conduct either simultaneously or in the future. Ask me for availability of real data if interested. Your project can, but does not have to, include a brain study. You may also propose a language intervention, as a follow up to an issue related to language input that we will discuss in class. Details about the final project will be discussed in class in Week 1. You may use the guidelines below as a

reference, and to make sure you stay on track. Please feel free to ask me questions about the final project in class at any time, or over email.

- 1) **Topic identification:** Select your topic and ask me for approval between Weeks 1 and 5. You may do this verbally in class, during office hours, or over email. While this is a rather informal step, please do complete it in order to prevent selecting an inappropriate topic, which will put you behind the schedule, in addition to lowering your Outline grade.
- 2) **Outline** your project and present your outline in class in Week 6. After I give you approval for your topic, please write up a 1-2 page (single spaced, 12 point standard font and standard margins) Outline of your project. This outline should include the following items (not necessarily in this order): present your question(s); brief (1 paragraph) outline of background research, citing at least 3 original studies; briefly propose an experiment / intervention to test your question(s); outline your hypothesis; briefly outline your experimental method; briefly outline your expected outcomes; briefly outline any problems you may run into; list of references at the end. Please email your outline to by me 8 am on Wednesday of Week 6. I will make sure that everybody has a copy of everybody's outline for the class. Below is the grading rubric for the outline:

Criteria	Ratings			Pts
Topic has been approved by me verbally or over email between Week 1 and Week 5.	Yes! 2 points	Topic proposed between Week 1 and 4; adjustments suggested, but new/revised topic not approved. 1 point	Topic not approved between Week 1 and 5. 0 points	2
Background research adequately summarized.	Yes! 2 points	Background research summarized, but some major points missing. 1 point	Background research not summarized and/or most major points missing. 0 points	2
Shows familiarity with at least 3 relevant, original research studies, which are correctly cited (APA style) and listed in references.	Yes! 2 points	Shows familiarity with 1-2 relevant original research studies, which are correctly cited; or shows familiarity with 3	Familiarity with back ground research inadequate, and/or not correctly cited or listed in references. 0 points	2

		research studies, but some incorrect citations or reference listings. 1 point		
Experimental question proposed clearly.	Yes! 1 point	Experimental question proposed, but clarity somewhat lacking. 0.5 points	Experimental question not proposed, and/or proposed unclear. 0 points	1
Hypothesis clearly stated.	Yes! 1 point	Hypothesis stated, but clarity somewhat lacking. 0.5 points	Hypothesis not stated or very unclear. 0 points	1
Experimental method clearly outlined.	Yes! 2 points	Most of experimental method clearly outlined; some sections unclear. 1 point	Most of experimental not outlined, or clarity lacking. 0 points	2
Expected outcomes clearly outlined.	Yes! 1 point	Most expected outcomes clearly outlined; some sections unclear. 0.5 points	Few expected outcomes clearly outlined. 0 points	1
Some potential problems identified, coping strategies and/or follow up studies proposed.	Yes! 1 point	Some potential problems identified, no coping strategies and/or no follow-up studies proposed. 0.5 points	No potential problems identified. 0 points	1
In class presentation	Yes! 2 points	Presenter somewhat	Familiarity with subject	2

of outline: presenter shows enthusiasm, familiarity with subject, receptive to feedback. All main points communicated in allotted time.		familiar with subject and somewhat enthusiastic; somewhat receptive to feedback; or some issues with timing. 1 point	and/or enthusiasm lacking; not receptive to feedback; major problem with timing. 0 points	
Outline formatting clear, and fits on 1-2 pages (single spaced, 12 point standard font and standard margins).	Yes! 1 points	Some issues with formatting and/or too long. 0.5 points	Major issues with formatting and/or length. 0 points	1
				15 points

- 3) Your final write-up: This should be a 3-5 page (single spaced, 12 point standard font and standard margins) research proposal where you elaborate on each of the Outline points). You should email this document to me by **March 16th at 8 am**. Your final write up should show an in-depth understanding of the question / problem, should cite at least 8 relevant research papers (not review or theoretical papers – you can have these as well, but in addition to at least 8 original studies), and should propose a feasible experiment. In addition to covering the points listed in the Outline, you should also include a short section describing how you incorporated the class feedback that you received in Week 6. Below is the grading rubric for the final paper:

Criteria	Ratings			Pts
Background research adequately summarized.	Yes! 3 points	Background research summarized, but some major points missing. 2-1 points	Background research not summarized and/or most major points missing. 0 points	3
Shows familiarity with at least 8 relevant, original research studies, which	Yes! 3 points	Shows familiarity with 4 or more original research studies, which are correctly	Familiarity with back ground research inadequate, and/or not correctly cited	3

are correctly cited and listed in references.		cited; or shows familiarity with more studies but incorrect citations or references. 2-1 points	or listed in references. 0 points	
Experimental question proposed clearly.	Yes! 2 points	Experimental question proposed, but clarity somewhat lacking. 1 points	Experimental question not proposed, and/or proposed unclear. 0 points	2
Hypothesis clearly stated.	Yes! 2 points	Hypothesis stated, but clarity somewhat lacking. 1 point	Hypothesis not stated or unclear. 0 points	2
Experimental method clearly outlined.	Yes! 4 points	Most of experimental method clearly outlined; some sections unclear. 3-1 points	Most of experimental not outlined, or clarity lacking. 0 points	4
Expected outcomes clearly outlined.	Yes! 3 points	Most expected outcomes clearly outlined; some sections unclear. 2-1 points	Few expected outcomes clearly outlined. 0 points	3
Some potential problems identified, coping strategies and/or follow up studies proposed.	Yes! 2 points	Some potential problems identified, no coping strategies and/or no follow-up studies proposed. 1 points	No potential problems identified. 0 points.	2

Section about incorporating feedback from Week 6 included; all identified issues adequately addressed.	Yes! 3 points	Section about incorporating feedback from Week 6 included; most issues adequately addressed. 2-1 points	Section about incorporating feedback from Week 6 not included, or included but most issues not adequately addressed. 0 points	3
Formatting clear, and fits on 3-5 pages (single spaced, 12 point standard font and standard margins).	Yes! 2 points	Some issues with formatting and/or too long. 1 point	Major issues with formatting and/or length. 0 points	2
Has a relevant title and an abstract summarizing all components of proposed study in 200 words or less.	Yes! 1 point	Has a relevant title and an ok abstract. Some components missing in abstract, or longer than 220 words. 0.5 points	Title not relevant. Abstract absent, or lacking multiple components or longer than 220 words. 0 points	1
				25 points

Grading: The following UW grading scale will be used
www.washington.edu/students/gencat/front/Grading_Sys.html)

Percent = Grade

≥ 95% = 4.0	88 = 3.3	81 = 2.6	74 = 1.9	67 = 1.2
94 = 3.9	87 = 3.2	80 = 2.5	73 = 1.8	66 = 1.1
93 = 3.8	86 = 3.1	79 = 2.4	72 = 1.7	65 = 1.0
92 = 3.7	85 = 3.0	78 = 2.3	71 = 1.6	64 = 0.9
91 = 3.6	84 = 2.9	77 = 2.2	70 = 1.5	63 = 0.8
90 = 3.5	83 = 2.8	76 = 2.1	69 = 1.4	60-62 = 0.7
89 = 3.4	82 = 2.7	75 = 2.0	68 = 1.3	< 60 = 0.0

Policies:

Classroom behavior/Academic integrity and conduct: In order for us to work together in creating an environment conducive to learning, anyone who disrupts class or who prevents others from learning will be asked to stop their behavior or leave. Please respect your fellow students. Activities such as talking

with a friend during lectures, looking at your phone, sleeping/snoring, packing up early, coming in late, or leaving early are considered discourteous and are examples of disruptive behaviors.

Students are expected to conduct themselves with the highest standards of academic ethics, honesty and integrity. Academic misconduct includes (but is not limited to) plagiarism, harassment, cheating, falsification, or disruptive behavior and will not be tolerated. It is your responsibility to read and understand the University's expectations in this regard (<http://www.washington.edu/cssc/for-students/student-code-of-conduct/>). Any student found to be in violation of proper academic conduct will be reported to the Advisory Committee on Student Conduct for a hearing.

Hand in your own work: I highly encourage you to work together with your classmates. However, you must use your own words when you produce the work that you hand in. This is true for all the materials that you will hand in. If you have worked on an assignment in a pair or in a group, include a note about this in your write up. (Example: I worked with John Smith and Maria Muñoz on this discussion guide. We discussed the readings, but then each of us wrote our own discussion points).

Special accommodations: To request academic accommodations due to a disability (e.g., a note taker, extra time on exams etc.), please contact Disabled Resources for Students (DRS), 011 Mary Gates, 543-8924(V), 543-8925 (TTY), uwdrs@uw.edu. If you have a letter or email from DRS indicating that you have a disability which requires special academic accommodations, please come to see me *at your earliest convenience* so the proper accommodations can be discussed and met.

Religious accommodations: Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (<https://registrar.washington.edu/students/religious-accommodations-request/>)."

Schedule overview, suggested readings, and additional materials

Week 1: Introduction: Why study language input and why take an interdisciplinary approach

Syllabus, class norms, expectations, workload

Week 1 Learning objectives:

- Understand the syllabus, class norms, expectations, workload
- Begin to understand the relationship between language input, brain development, language learning, and long-term educational outcomes.
- Begin to understand the complexities of research finding related to the "30-million word gap".
- Begin to understand some of the methods to study language input.

Assigned Readings:

- (1) This Syllabus
- (2) Golinkoff, R. M., Hoff, E. , Rowe, M. L., Tamis-LeMonda, C. S., & Hirsh-Pasek, K. (2019). Language Matters: Denying the Existence of the 30-Million-Word Gap Has Serious Consequences. *Child Development*, 90: 985-992. doi:10.1111/cdev.13128

Presenter: Naja

Week 2: Overview of typical language development; Basics of human brain

Suggested Readings:

- (1) Kuhl, P. K. (2004). Early language acquisition: Cracking the speech code. *Nature Reviews Neuroscience*, 5, 831-843.
- (2) Shonkoff, J. P., Phillips, D. A., & National Research Council (U.S.). (2000). *From neurons to neighborhoods: The science of early child development*. Washington, D.C: National Academy Press. Ch 6: Communicating and learning (read only up to Language Impairment).
- (3) Shonkoff, J. P., Phillips, D. A., & National Research Council (U.S.). (2000). *From neurons to neighborhoods: The science of early child development*. Washington, D.C: National Academy Press. Ch 8: The developing brain.

Additional Resources:

- I-LABS outreach modules: 2, 6, and 10. <http://modules.ilabs.uw.edu/outreach-modules/>
- Brain processes overview videos
 - https://www.youtube.com/watch?v=XdN9i_ZWGho
 - <https://www.youtube.com/watch?v=VNNsN9IJkws>
 - Myelination: <https://www.youtube.com/watch?v=5V7RZwDpmXE>
 - Synaptogenesis & pruning: <https://www.youtube.com/watch?v=0S0jKbh6R1I>

Presenter: Wenjun Ma

Week 3: The brain architecture for language processing; Modern methods for studying the infant and child brain

Suggested Readings:

- (1) Kuhl, P. K. & Rivera-Gaxiola, M. (2008). Neural substrates of language acquisition. *Annual Review of Neuroscience*, 31, 511-534.
- (2) Sedivy, J. (2018). *Language in mind: An introduction to psycholinguistics*. Chapter 3: Language and the Brain.
- (3) Hickok, G., & Poeppel, D. (2007). The cortical organization of speech processing. *Nature Reviews Neuroscience*, 8(5), 393-402.

Presenter: TBD

Week 4: Language deprivation and the critical period for language

Suggested Readings:

- (1) Fromkin, V., Krashen, S., Curtiss, S., Rigler, D., & Rigler, M. (1974). The development of language in Genie: a case of language acquisition beyond the 'critical period'. *Brain and Language*, 1, 81-107.
- (2) Windsor, J.J., Benigno, J.P., Wing, C.A., Carroll, P.J., Koga, S.F., Nelson, C.A., Fox, N.A., & Zeanah, C.H. (2011). Effect of foster care on young children's language learning. *Child development*, 82 4, 1040-6.
- (3) Video on BEIP by Center on the Developing Child at Harvard:
<https://developingchild.harvard.edu/resources/inbrief-the-science-of-neglect-video/>
- (4) Genie Video: https://www.youtube.com/watch?v=VQzN5G7u5_k

Additional Resources:

- Nelson, C.A., Fox, N.A., Zeanan, C.H. (2013) Anguish of the Abandoned Child in Scientific American, 308, 4, 62-67. (this is a popular press description of BEIP)
- Another video on feral children: <https://www.youtube.com/watch?v=cymZq1VbIU0>

Presenter: TBD

Week 5: Critical period revised: Sign language acquisition and neural processing

Suggested Readings:

- (1) Anderson, D., Reilly, J. (2002). The McArthur communicative developmental inventory: Normative data for American sign language. *Journal of Deaf Studies and Deaf Education*, 7, 83–104.
- (2) Ferjan Ramírez, N., Leonard, M.K., Torres, C., Hatrak, M., Halgren, E., Mayberry, R.I.. (2013) Neural language processing in adolescent first-language learners. *Cerebral Cortex* doi: 10.1093/cercor/bht137.
- (3) Mayberry, R. I. & Kluender, R. (2017). Rethinking the critical period for language: Insights into an old question from American Sign Language. *Bilingualism: Language and Cognition*, 1-20. doi:10.1017/S1366728917000724. *NOTE: this is a very long paper, so there is no need to read it in detail or prepare a discussion guide for it. Skim through and read the sections that will help you achieve the learning objectives.*
- (4) Ferjan Ramírez, N., Lieberman, A., Mayberry, R.I. (2013). The initial stages of first-language acquisition begun in adolescence: When late looks early. *Journal of Child Language*, 40(2), 391-414.

Presenter: TBD

Week 6: Student presentations of final project topics.

Suggested Readings: none, but see points 1) and 2) under Final Project.

Presenter: All students

Week 7: Socioeconomic status, brain, and language

Suggested Readings:

- (1) Pace, A., Luo, R., Hirsh-Pasek, K., & Golinkoff, R. M. (2017). Identifying pathways between socioeconomic status and language development. *Annual Review of Linguistics*, 3, 285-308. <https://doi.org/10.1146/annurev-linguistics-011516-034226>.
- (2) Fernald, A., Marchman, V. A., Weisleder, A. (2013). SES differences in language processing skill and vocabulary are evident at 18 months. *Developmental Science*, 16, 234–248.
- (3) Johnson SB, Riis JL, Noble KG. State of the Art Review: Poverty and the Developing Brain. *Pediatrics*. 2016;137(4):e20153075.
- (4) Romeo, R. R. (2019). Socioeconomic and experiential influences on the neurobiology of language development. Invited review at Perspectives of the ASHA Special Interest Groups: Special Issue on the Neurobiology of Language Development and Disorders. (ask me for a copy if you can't find it online).

Additional Resources:

- Dr. Kimberly Noble's TED Talk on poverty and the developing brain
https://www.ted.com/talks/kimberly_noble_how_does_income_affect_childhood_brain_development?language=en

Presenter: TBD

Week 8: Language input in two (or more) languages: Childhood bilingualism and multilingualism

Suggested Readings:

- (1) Byers-Heinlein, K., & Werker, J.F. (2009). Monolingual, bilingual, trilingual: infants' language experience influences the development of a word-learning heuristic. *Developmental science*, 12 5, 815-23 .
- (2) Garcia-Sierra, A., Rivera-Gaxiola, M., Percaccio, C.R., Conboy, B.T., Romo, H., Klarman, L., Ortiz, S., & Kuhl, P.K. (2011). Bilingual language learning: An ERP study relating early brain responses to speech, language input, and later word production. *Journal of Phonetics*, 39, 546-557.
- (3) Werker, J.F., & Byers-Heinlein, K. (2008). Bilingualism in infancy: first steps in perception and comprehension. *Trends in Cognitive Sciences*, 12, 144-151.
- (4) Ferjan Ramirez, N., Ramirez, R.R., Clarke, M., Taulu, S., Kuhl, P.K. (2016). Speech discrimination in 11-month-old bilingual and monolingual infants: A magnetoencephalography study. *Developmental Science*, e12427. <https://doi.org/10.1111/desc.12427>

Additional Resources:

- I-LABS Outreach module 11. <http://modules.ilabs.uw.edu/outreach-modules/>

For those interested in social issues around bilingualism / multilingualism:

- McCabe, A., Tamis-LeMonda, C. S., Bornstein, M.H., Cates, C. B., Golinkoff, R., Hirsh-Pasek, K., ... Guerra, A.W. (2013). Multilingual children: Beyond myths and towards best practices. *Social Policy Report*, Society for Research in Child Development, 27, 1–37.

Presenter: TBD

Week 9: The Social Brain; Language learning from screen media

Suggested Readings:

- (1) Kuhl, P. K., Tsao, F.-M., & Liu, H.-M. (2003). Foreign-language experience in infancy: Effects of short-term exposure and social interaction on phonetic learning. *Proceedings of the National Academy of Sciences*, 100, 9096-9101.
- (2) Romeo, R. R., Leonard, J. A., Robinson, S. T., West, M. R., Mackey, A. P., Rowe, M. L., & Gabrieli, J. D. E. (2018). Beyond the 30-Million-Word Gap: Children's Conversational Exposure Is Associated With Language-Related Brain Function. *Psychological Science*, 29(5), 700–710.
- (3) Lytle, S.R., Garcia-Sierra, A., Kuhl, P.K. (2018) Two are better than one: Infant language learning from video improves in the presence of peers. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 115 (40) 9859-9866.
- (4) Hutton, J.S., Dudley, J., Horowitz-Kraus, T. et al. (2019). Associations Between Screen-Based Media Use and Brain White Matter Integrity in Preschool-Aged Children. *JAMA Pediatrics*.

Additional Resources:

- I-LABS outreach module 3

<http://modules.ilabs.uw.edu/module/importance-early-interactions/>

Presenter: TBD

Week 10: Language intervention; Peer review

Please note that this class will be a bit untraditional. Your job will be to read an intervention study on parental language input, but focus on the peer review process. You will therefore read the originally submitted manuscript, the reviewers' comments and authors' responses, and the final (published) manuscript. Your discussion guide for this week thus focuses on only one reading (the final publication), but you should also include brief answers to the learning objectives listed below – these should be relatively straightforward to figure out from the assigned reading.

Learning objectives:

- Define parentese, and explain how it differs from adult directed speech, overheard speech, and child-directed speech
- What are some benefits of parentese and why do you think this is?
- What are some disadvantages of the parent coaching study? What could the researchers have done differently and what might be some challenges around that?
- Understand the advantages and disadvantages of the LENA technology (feel free to browse their website for more information. See also supplemental readings).
- Understand the process of peer review.
- In the example paper, identify the main issues with the first draft. Which ones were addressed and why (not)?
- Which of the reviewers comments do you think the authors found helpful and constructive? What do they have in common? Which comments were not helpful?

Assigned Readings:

- (1) Ferjan Ramírez, N., Lytle, S., Fish, M., Kuhl, P.K. (2018). Parent coaching at 6 and 10 months improves language outcomes at 14 months: A randomized controlled trial. *Developmental Science*, e12762. <https://doi.org/10.1111/desc.12762>. Please read the first version of manuscript, second version of manuscript, and both letters to editor (PDFs in folder labeled 1-5)

Additional Resources (optional):

- Shonkoff, J. P., Phillips, D. A., & National Research Council (U.S.). (2000). From neurons to neighborhoods: The science of early child development. Washington, D.C: National Academy Press. Ch 13: Promoting healthy development through intervention. *NOTE: this is a very long chapter, so there is no need to read it in detail. However, having a basic idea of the content will enhance your ability to participate in class. I recommend reading the following sections: Beginning of chapter to Assessing Developmental Outcomes and Mediators; Lessons Learned and Future Challenges*
- The LENA website: <https://www.lena.org/>
- A detailed description of the purpose of LENA, and some of the original findings. https://www.lena.org/wp-content/uploads/2016/07/LTR-01-2_PowerOfTalk.pdf

Presenter: Naja

Summary:

How to succeed in this class?

Come to class and participate, do your readings, bring your discussion guide to each class. Collaborate, but hand in your own work.

Your grade: READ ALL GRADING RUBRICS CAREFULLY

1. Participation (30%) (50% if signed up for 2 credits)
 - 15% for discussion guides
 - 15% for in class participation

You can earn 10 points in each class. You will be graded in seven classes (not in Week 1, Week 6, and when you present). Your lowest grade will be dropped.

2. In class presentation / discussion (30%) (50% if signed up for two credits)
 - Handout (10%) – emailed to me by 8 am on the day on which you will briefly present your handout in class, which is 1 week before your scheduled in class presentation
 - In class presentation / discussion (20%)
3. Final project (40%) (50% if signed up for 2 credits)
 - Topic approved by me between weeks 1 and 6
 - Week 6 outline and short in-class presentation (15%)
 - Final paper (25%)

When you are scheduled to present:

- Handout sent to me by 8 am on Wednesday 1 week before your scheduled in class presentation / discussion
- Handout briefly presented in class one week before your scheduled in class presentation / discussion (the purpose of this is to let everybody know what the readings are, and what to look for in the readings)
- Present in class. Send me your own grading rubric after.