Attention!

This is a *representative* syllabus.

The syllabus for the course when you enroll may be *different*.

Use the syllabus provided by *your* instructor for the most up-to-date information. Please refer to your instructor for more information for the specific requirements for a given semester.

Feel free to contact the Psychology Advising Office for any questions regarding psychology courses either by email (psychadvising@osu.edu) or phone (614.292.5750).

Thank you!

Psychology 5628
Fall 2021

Credit: 3 hours
Text: readings will be posted online and are listed below
Prerequisites: Either Psychology 3313 or 3513
Course webpage:

Course Description & Objectives:
The field of developmental cognitive neuroscience involves trying to understand how the brain supports complex thoughts and behaviors by studying how these processes emerge over development, and how our genes, brains, and experiences interact to make us all unique individuals. Some hot questions include: How does the brain change over the first few years of life and how do these changes support the accompanying changes in perception and cognition? What brain architecture is present when you are born, and how does it change with maturation vs. experience? How does early brain structure and function constrain later learning and plasticity? We will assay foundational studies as well as the latest literature to formulate the field's current answers to these questions.

Specific topics covered will include current methodologies, introduction to developmental neurobiology, low and high-level sensory perception, cognition, social and emotional processing, neurodevelopmental disorders, and early brain injury and plasticity. Although this class is mainly about the human brain, we will discuss some animal literature as it pertains to human evolution and ontogeny.

The objective of the course is for students to grasp the fundamentals of the field, understand the latest literature, and what gaps in our knowledge remain (and how to address these gaps with the latest methods). This course will be a mixture of lecture and discussion, with the instructor lecturing on the background/history of each topic during the first class of each topic, followed by student-led presentations and discussions on the latest empirical papers on the topic. Each student is expected to read the book chapter(s) and papers before each class. Grades will be given based on course participation, weekly response papers, and student presentations.

Resources:
Textbooks: (optional)- Developmental Cognitive Neuroscience, 4th Edition Mark H. Johnson & Michelle de Haan
(optional)- Handbook of Developmental Cognitive Neuroscience, edited by Charles A. Nelson & Monica Luciana

Website: The course website is on Carmen. This site is where all course materials will be available.

Presentations: All students will be responsible for presenting an empirical paper and leading a discussion on the paper. You will choose the date and paper to present from the available readings below. You will have to sign up for multiple presentation dates (TBD). The presentation should be a 10-13 minute powerpoint, keynote, or equivalent presentation of the background, methods, results, and implications of the paper. Each week/session will have a graduate student Session Leader. Presenters for each week should email their presentations to the Session Leader prior to the start of each class. This leader's laptop will then be used by the presenters during class. Presenters also need to email the Session Leader points for their paper. At the end of all the talks (usually on Thursdays) the Session Leader will provide a short ~5 minute summary of the papers and bring up a few central discussion points related to the topic of that week and how these papers address it/fail to address it/open questions that remain.

Every student will be expected to present at least once and perhaps more, depending on the total number of class participants. Presenters need to give a brief overview of the questions answered by the paper (talk about some background research as needed), present the methods in a clear manner such that we can all understand it, and discuss the results of the paper. In order to have productive conversations, please discuss one or more things the paper accomplishes well and one or more things that the paper fails to do well. Think about whether the paper answers the question(s) it set out to answer and how you would have set out to answer that question. **Presentations will be worth 60% of the grade. Graduate students will be expected to lead at least one session as part of their grade. Undergraduates will have an opportunity to lead one of the later sessions to earn more points/raise their grade.**

See Presentation Grading Scale document and Example Presentation posted on Carmen for more info.

Participation: All students are expected to attend class and participate in the lectures and discussions. Participation is worth **10% of the grade.**

Discussion questions: <u>On weeks that they're not presenting</u>, students must submit weekly discussion questions/response papers (half-page, due Thursdays at 10pm). The weekly response can either compare the assigned papers and discuss their merits in answering questions in developmental cognitive neuroscience; OR find an alternative empirical paper that better addresses the current topic and discuss why. **Discussion questions will be worth 30% of the grade.**

Absences: Illness and personal/professional obligations may be accepted as an excuse for missing class and **you do not need a doctor's note.** You will still be responsible for turning in discussion questions for the day that you were absent, with a reasonable (~1 week) delay. If you cannot present on the day that you are scheduled to present, you will need to present on another day on another topic. ***If you are sick, please sign on through Zoom. I will provide the link on Carmen.***

Grading: Grades will be based out of 100 points.
Presentation: 60 points
Participation: 10 points
Response papers: 30 points

The following grading scale will be used to assign final grades:

A	93-100%	C	73-76.99%
A-	90-92.99%	C-	70-72.99%
B+	87-89.99%	D+	67-69.99%
B	83-86.99%	D	63-66.99%
B-	80-82.99%	D-	60-62.99%
C+	77-79.99%	E	0-59.99%

Assistance: I am available to talk to you about any of the course topics. I encourage starting your class preparation earlier so that we can discuss any questions or concerns you have in advance of the class, especially if you are presenting. **Email me to set up an appointment to chat over Zoom but please no unscheduled drop-ins or in-person appointments.**

Disabilities Statement: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292- 3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct at http://studentlife.osu.edu/csc/.

Sexual misconduct/relationship violence: Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Class Schedule (subject to change)

Week 1: **Introduction and Methods**
Aug 24
Introduction & background; why study developmental cognitive neuroscience? Organization of class, sign up for presentation papers.

Aug 26
Methodological paradigms; event-related potentials; magnetic resonance imaging; genetic methods; neural networks; application of animal tests of cognition
Background reading: https://www.nature.com/articles/nrn.2018.1

Week 2: **Building a Brain: Genetics, Activity-dependent & experience-dependent change**
How can we model the developing human brain & mind, how much of the brain is determined by genetics, spontaneous activity, and experience?
Aug 31 – Presentations
1. Tenenbaum, Joshua B., et al. How to Grow a Mind: Statistics, Structure, and Abstraction. Science 331, no. 6022 (2011): 1279–85.
2. Syndor V. et al. Neurodevelopment of the association cortices: Patterns, mechanisms, and implications for psychopathology. Neuron (2021). https://www-sciencedirect-com.proxy.lib.ohio-state.edu/science/article/pii/S0896627321004578
3. Huntenburg J., et al. Large-scale gradients in human cortical organization. Trends in Cognitive Sciences. (2018).
Sept 2 – Presentations
4. Minlebaev, M., et al. (2011). Early gamma oscillations synchronize developing thalamus and cortex. Science, 334(6053), 226-229.
5. Bitzenhofer S.H., et al. (2021). Neuron. Transient developmental increase in prefrontal activity alters network maturation and causes cognitive dysfunction in adult mice.
6. Rekik et al. 2017 Neuroimage. Joint prediction of longitudinal development of cortical surfaces and white matter fibers from neonatal MRI.
7. Moser et al. 2021. Magnetoencephalographic signatures of conscious processing before birth. Developmental Cognitive Neuroscience.

Week 3: **Low level vision & endogenous vs. experience-dependent brain development**
How does endogenous activity in the womb shape visual perception?
Sept 7 – Presentations
1. Elstrott, Justin, and Marala B. Feller. "Vision and the Establishment of Direction—selectivity: a Tale of Two Circuits." Current Opinion in Neurobiology 19, no. 3 (2009): 293–7.
2. Wang, Bor-Shuen, et al. "Critical Period Plasticity Matches Binocular Orientation Preference in the Visual Cortex." Neuron 65, no. 2 (2010): 246–56.
3. Xu, Hong-Ping, et al. "An Instructive Role for Patterned Spontaneous Retinal Activity in Mouse Visual Map Development." Neuron 70, no. 6 (2011): 1115–27.
Sept 9 – Presentations
4. Arcaro and Livingstone (2017). A hierarchical, retinotopic proto-organization of the primate visual system at birth. eLife, e26196. DOI: 10.7554/eLife.26196
5. Röder, B., Ley, P., Shenoy, B. H., Kekunnaya, R., & Bottari, D. (2013). Sensitive periods for the functional specialization of the neural system for human face processing. PNAS, 110(42), 16760-16765.

6. Jandó, G., Mikó-Baráth, E., Markó, K., Hollódy, K., Török, B., & Kovacs, I. (2012). Early-onset binocularity in preterm infants reveals experience-dependent visual development in humans. Proceedings of the National Academy of Sciences, 109(27), 11049-11052.

7. Ellis, C. T., Yates, T. S., Skalaban, L. J., Bejjanki, V. R., Arcaro, M. J., & Turk-Browne, N. B. (2021). Neuron. Retinotopic organization of visual cortex in human infants

Week 4 High-level visual perception

To what extent are high-level visual representations innate and how are they honed with experience?

Sept 14 – Presentations

1. Rosa-Salva, Orsola, et al. "Faces are Special for Newly Hatched Chicks: Evidence for Inborn Domain-specific Mechanisms Underlying Spontaneous Preferences for Face-like Stimuli." Developmental Science 13, no. 4 (2010): 565–77.

2. Zhu, Qi, et al. "Heritability of the Specific Cognitive Ability of Face Perception." Current Biology 20, no. 2 (2010): 137–42.

3. Kelly, David J., et al. "Development of the Other-race Effect During Infancy: Evidence Toward Universality?" Journal of Experimental Child Psychology 104, no. 1 (2009): 105–14.

Sept 16 – Presentations

4. Deen et al. 2017. https://www.nature.com/articles/ncomms13995

5. Srihasam K, Vincent J, Livingstone M. (2014). Novel domain formation reveals proto-architecture in inferotemporal cortex. Nature neuroscience 2014. 17(12) pp: 1776-83

6. van den Hurk J., Van Baelen M., Op de Beeck HP. (2017). Development of visual category selectivity in ventral visual cortex does not require visual experience.

PNAS, 114(22):4501-4510.

7. Bedny M., Pascual-Leone A., Dodell-Feder D., Fedorenko E., Saxe M, (2011). Language processing in the occipital cortex of congenitally blind adults. PNAS. 2011. 108 (11) 4429-4434; DOI:10.1073/pnas.1014818108

Week 5 Literacy and Numeracy

How are new cultural representations like reading instantiated in the brain?

Sept 21 – Presentations

1. Yeatman, White. (2021). https://www.annualreviews.org/doi/abs/10.1146/annurev-vision-093019-113509

2. Hannagan, et al. (2015). https://www.sciencedirect.com/science/article/pii/S1364661315001187

3. Wang, ..., Dehaene. Representation of Numerical and Sequential Patterns in Macaque and Human Brains. Current Biology 2015. 25(15), 1966-1974.

Sept 23 – Presentations

4. Peters, S., van der Meulen, M., Zanolie, K., & Crone, E. A. (2017). Predicting reading and mathematics from neural activity for feedback learning. Developmental Psychology, 53(1), 149-159.

5. Glezer et al. (2015). http://www.jneurosci.org/content/35/12/4965

6. Evans et al. 2015 J. Neurosci. Brain Structural Integrity and Intrinsic Functional Connectivity Forecast 6 Year Longitudinal Growth in Children's Numerical Abilities. https://pubmed.ncbi.nlm.nih.gov/26290250/

7. Aboud, Barquero, Cutting (2018). Prefrontal mediation of the reading network predicts intervention response in dyslexia. Cortex.

Week 6 Connectivity driving development & plasticity

How much does early connectivity drive cortical arealization in normal development or in the case of sensory deprivation? How does early connectivity predict later cognitive gains and individual variability in typical development?

Sept 28 – Presentations

1. *Li J., Osher, D., Hansen H., Saygin, Z.M. (2020). "Innate connectivity patterns drive the development of the visual word form area". Scientific Reports.*

2. *Striem-Amit E, Cohen L, Dehaene S, Amedi A: Reading with sounds: sensory substitution selectively activates the visual word form area in the blind. Neuron 2012, 76:640-652.*

3. *Abboud S, Maidenbaum S, Dehaene S, Amedi A: A number-form area in the blind. Nat Commun 2015:6.*

4. *Striem-Amit E, Amedi A: Visual cortex extrastriate body-selective area activation in congenitally blind people seeing by using sounds. Curr Biol 2014, 24:687-692.*

Sept 30 – Presentations

5. *Gao, W., Alcauter, S., Elton, A., Hernandez-Castillo, C. R., Smith, J. K., Ramirez, J., & Lin, W. (2014). Functional network development during the first year: relative sequence and socioeconomic correlations. Cerebral cortex, 25(9), 2919-2928.*

6. *Alcauter, S., Lin, W., Smith, J. K., Goldman, B. D., Reznick, J. S., Gilmore, J. H., & Gao, W. (2015). Frequency of spontaneous BOLD signal shifts during infancy and correlates with cognitive performance. Developmental cognitive neuroscience, 12, 40-50.*

7. *O'Muircheartaigh, J., Dean, D. C., Ginestet, C. E., Walker, L., Waskiewicz, N., Lehman, K., ... & Deoni, S. C. (2014). White matter development and early cognition in babies and toddlers. Human brain mapping, 35(9), 4475-4487.*

8. *Girault et al. 2019 Neuroimage White matter connectomes at birth accurately predict cognitive abilities at age 2. https://pubmed.ncbi.nlm.nih.gov/30825656/*

Week 7 Auditory perception, Speech, Language, Music (p.1)

What aspects of language are innate, how are representations honed through maturation and experience, and how can language facilitate domain-general cognition?

Oct 5 – Presentations

1. *Kuhl, Patricia K. "Brain Mechanisms in Early Language Acquisition." Neuron 67, no. 5 (2010): 713–27.*

2. *Capek, Cheryl M., et al. "Brain Systems Mediating Semantic and Syntactic Processing in Deaf Native Signers: Biological Invariance and Modality Specificity." Proceedings of the National Academy of Sciences of the United States of America 106, no. 21 (2009): 8784–9.*

Oct 7 – Presentations

3. *Dehaene-Lambertz G, Hertz-Pannier L, Dubois J, Mériaux S, Roche A, Sigman M, Dehaene S. Functional organization of perisylvian activation during presentation of sentences in preverbal infants (2006). Proc Natl Acad Sci U S A. 2006 Sep 19;103(38):14240-5.*

4. *Shultz S, Vouloumanos A, Bennett RH, Pelphrey K. (2014). Neural specialization for speech in the first months of life. Dev Sci. 2014 Sep;17(5):766-74.*

5. *MacSweeney, Mairead, et al. "Phonological Processing in Deaf Signers and the Impact of Age of First Language Acquisition." Neuroimage 40, no. 3 (2008): 1369–79.*

Week 8 Auditory perception, Speech, Language, Music (p.2)

Oct 12 – Presentations

6. *Mahmoudzadeh, M., Dehaene-Lambertz, G., Fournier, M., Kongolo, G., Goudjil, S., Dubois, J., ... & Wallois, F. (2013). Syllabic discrimination in premature human infants prior to complete formation of cortical layers. Proceedings of the National Academy of Sciences, 110(12), 4846-4851.*

7. Peña, M., Pittaluga, E., & Mehler, J. (2010). Language acquisition in premature and full-term infants. Proceedings of the National Academy of Sciences, 107(8), 3823-3828.

8. Gonzalez-Gomez, N., & Nazzi, T. (2012). Phonotactic acquisition in healthy preterm infants. Developmental science, 15(6), 885-894.

9. Kovacs, Agnes Melinda, and Jacques Mehler. "Cognitive Gains in 7-month-old Bilingual Infants." Proceedings of the National Academy of Sciences of the United States of America 106, no. 16 (2009): 6556–60.

Oct 14 Autumn break, no classes

Week 9 Declarative & Non-declarative Learning & Memory

How do children learn and retain knowledge?

Oct 19 – Presentations

1. Vargha-Khadem, F., Salmond, C. H., Watkins, K. E., Friston, K. J., Gadian, D. G., & Mishkin, M. (2003). Developmental amnesia: effect of age at injury. Proceedings of the National Academy of Sciences, 100(17), 10055-10060.

2. Friedrich M., Wilhelm I., Mölle M., Born J., Friederici AD., The Sleeping Infant Brain Anticipates Development. Curr Biol. 2017 Aug 7;27(15):2374-2380.e3. doi: 10.1016/j.cub.2017.06.070. Epub 2017 Jul 27.

3. Finn et al. 2016. Developmental dissociation between the maturation of procedural memory and declarative memory

Oct 21 – Presentations

4. Qin et al. 2014 NatNeurosci. Hippocampal-neocortical functional reorganization underlies children's cognitive development.

5. Prabhakar et al. 2018 PNAS. Memory-related hippocampal activation in the sleeping toddler. https://www.pnas.org/content/115/25/6500

6. Ellis, C. T., Skalaban, L. J., Yates, T. S., Bejjanki, V. R., Córdova, N. I., & Turk-Browne, N. B. (2021). Evidence of hippocampal learning in human infants. Current Biology.

7. Making memories: a cross-sectional investigation of episodic memory encoding in childhood using FMRI. https://pubmed.ncbi.nlm.nih.gov/16515409/

Week 10 Emotional processing

How innate or universal are emotional responses and perceptions and how does stress impact development?

Oct 26 – Presentations

1. Uliana et al. (2020). Neuropsychopharmacology. https://www-nature-com.proxy.lib.ohio-state.edu/articles/s41386-020-00886-3

2. Kroi, Monakhov, ..., Grossmann. (2015). Genetic variation in CD38 and breastfeeding experience interact to impact infants' attention to social eye cues. PNAS 112 (39) E5434-E5442. https://doi.org/10.1073/pnas.1506352112

3. Gee, Gabard-Durnam,.., Tottenham. (2013). Early developmental emergence of human amygdala–prefrontal connectivity after maternal deprivation. PNAS. 2013.

Oct 28 – Presentations

4. Papageorgiou, K. A. et al. (2015). Individual Differences in Newborn Visual Attention Associate with Temperament and Behavioral Difficulties in Later Childhood. Scientific Reports 5, 11264; doi: 10.1038/srep11264.

5. Sylvester et al. 2018 (Am J Psychiatry). Cortical Functional Connectivity Evident After Birth and Behavioral Inhibition at Age 2. https://pubmed.ncbi.nlm.nih.gov/28774192/

6. Herzberg et al. .Developmental Cognitive Neuroscience. (2021) https://www-sciencedirect-com.proxy.lib.ohio-state.edu/science/article/pii/S187892932100013X

__Week 11__ Social Cognition

How do we perceive & act on the social world, how does it develop, and how much does it depend on other mental faculties like language or executive function?

Nov 2 –Presentations

1. Wiesmann et al. 2017. White matter maturation is associated with the emergence of Theory of Mind in early childhood. Wiesmann et al. 2017. Nature communications. DOI: 10.1038/ncomms14692.

2. Davis, E.P., Stout, S.A., ... Baram, T.Z. (2017). Exposure to unpredictable maternal sensory signals influences cognitive development across species. PNAS. 2017 Sep 11. pii: 201703444. doi: 10.1073/pnas.1703444114.

3. Bedny, Pascual-Leone, Saxe. (2009). Growing up blind does not change the neural bases of Theory of Mind. PNAS. 106 (27) 11312-11317.

Nov 4 – Presentations

4. Whyte et al. 2016; Animal, but not human, faces engage the distributed face network in adolescents with autism. Developmental Science 19:2 (2016), pp 306–317.

5. Pavlova et al. 2017; "Social cognition in autism: Face tuning" *Scientific Reports. 7: 2734. DOI:10.1038/s41598-017-02790-1*

6. Apperly, Ian A., et al. "Studies of Adults Can Inform Accounts of Theory of Mind Development." Developmental Psychology 45, no. 1 (2009): 190–201.

7. Lackner, Christine, et al. "Dopamine Receptor D4 Gene Variation Predicts Preschoolers' Developing Theory of Mind." Developmental Science 15, no. 2 (2012): 272–80.

__Week 12__ Geometry & Navigation

Are geometry & navigation innate representations that require little to no experience? Do we use these reference frames to guide more complex conceptual representations?

Nov 9 – Presentations

1. Chiandetti, Cinzia, and Giorgio Vallortigara. "Experience and Geometry: Controlled—rearing Studies with Chicks." Animal Cognition 13, no. 3 (2010): 463–70.

2. Wills, Tom J., et al. "Development of the Hippocampal Cognitive Map in Preweanling Rats." Science 328, no. 5985 (2010): 1572–6.

3. Iaria, Giuseppe, and Jason J. S. Barton. "Developmental Topographical Disorientation: A Newly Discovered Cognitive Disorder." Experimental Brain Research 206, no. 2 (2010): 189–96.

4. Lakusta, Laura, et al. "Impaired Geometric Reorientation Caused by Genetic Defect." Proceedings of the National Academy of Sciences of the United States of America 107, no. 7 (2010): 2813–7.

Nov 11 – No class (Veteran's Day)

__Week 13__ Cognitive Control & Decision-Making

How does executive function develop, why does it take so long, and how does its development influence other cognitive functions?

Nov 16 –Presentations

1. Darki & Klingberg (2014). The Role of Fronto-Parietal and Fronto-Striatal Networks in the Development of Working Memory: A Longitudinal Study. Cerebral Cortex, Volume 25, Issue 6, 1 June 2015, Pages 1587–1595.

2. Brod et al. 2017. Does One Year of Schooling Improve Children's Cognitive Control and Alter Associated Brain Activation?

3. Achterberg, M., Peper, J. S., van Duijvenvoorde, A. C. K., Mandl, R. C. W., & Crone, E. A. (2016). Frontostriatal white matter integrity predicts development of delay of gratification: A longitudinal study. Journal of Neuroscience, 36(6), 1954 –1961.

Nov 18 – Presentations

4. Watts T.W., Duncan G.J., Quan H. (2018). Revisiting the Marshmallow Test: A Conceptual Replication Investigating Links Between Early Delay of Gratification and Later Outcomes. Psychological Science, doi: 10.1177/0956797618761661

5. *Developmental changes in category-specific brain responses to numbers and letters in a working memory task.* https://pubmed.ncbi.nlm.nih.gov/19027079/

6. Ellis, C. T., Skalaban, L. J., Yates, T. S., & Turk-Browne, N. B. (2021). Attention recruits frontal cortex in human infants. PNAS.

7. Chrysikou et al. (2011). The Other Side of Cognitive Control: Can a Lack of Cognitive Control Benefit Language and Cognition? Topics in Cognitive Science

Week 14 Early brain injury, intervention, and plasticity (p.1)

How do neural representations reorganize after early brain injury & early intervention (and does the location of the injury matter)? What mental faculties recover after injury and what are the critical periods for plasticity?

Nov 23– Presentations

1. Beharelle, A. R., Dick, A. S., Josse, G., Solodkin, A., Huttenlocher, P. R., Levine, S. C., & Small, S. L. (2010). Left hemisphere regions are critical for language in the face of early left focal brain injury. Brain, 133(6), 1707-1716.

2. Dick, A. S., Beharelle, A. R., Solodkin, A., & Small, S. L. (2013). Interhemispheric functional connectivity following prenatal or perinatal brain injury predicts receptive language outcome. The journal of Neuroscience, 33(13), 5612-5625.

3. Lidzba, K., Konietzko, A., Schwilling, E., Krägeloh-Mann, I., & Winkler, S. (2013). Processing of non-canonical word-order: A case-series on lesion-induced reorganized language and age-effects in typical development. Brain and language, 127(3), 377-387.

4. Liegois, Frederique, et al. "Speaking with a Single Cerebral Hemisphere: FMRI Language Organization after Hemispherectomy in Childhood." Brain and Language 106, no. 3 (2008): 195–203.

Nov 25 (thanksgiving break)

Week 15 Early brain injury and plasticity (p.2)

Nov 30 – Presentations

5. Rowe, Meredith L., et al. "Does Linguistic Input Play the Same Role in Language Learning for Children with and without Early Brain Injury?" Developmental Psychology 45, no. 1 (2009): 90–102.

6. Paul, B., Appelbaum, M., Carapetian, S., Hesselink, J., Nass, R., Trauner, D., & Stiles, J. (2014). Face and location processing in children with early unilateral brain injury. Brain and cognition, 88, 6-13.

7. Haan, Michelle de, et al. "Human Memory Development and its Dysfunction after Early Hippocampal Injury." Trends in Neurosciences 29, no. 7 (2006): 374–81.

8. Race, Elizabeth, et al. "Medial Temporal Lobe Damage Causes Deficits in Episodic Memory and Episodic Future Thinking not Attributable to Deficits in Narrative Construction." The Journal of Neuroscience 31, no. 28 (2011): 10262–9.

Dec 2 – Presentations

9. Laumann et al. (2021). The Lancet Neurology. Brain network reorganisation in an adolescent after bilateral perinatal strokes. https://www.thelancet.com/journals/laneur/article/PIIS1474-4422(21)00062-4/fulltext

10. Huber, Donnelly, Rokem, Yeatman (2018). Rapid and widespread white matter plasticity during an intensive reading intervention. Nature Neuroscience.

11. Talwar, Victoria, et al. "Effects of a Punitive Environment on Children's Executive Functioning: A Natural Experiment." Social Development 20, no. 4 (2011): 805–24.

12. Diamond, Adele, and Kathleen Lee. "Interventions Shown to Aid Executive Function Development in Children 4 to 12 Years Old." Science 333, no. 6045 (2011): 959–64.

13. Bavelier, Daphne, et al. "Removing Brakes on Adult Brain Plasticity: from Molecular to Behavioral Interventions." The Journal of Neuroscience 30, no. 45 (2010): 14964–71.

Week 16 last class

Dec 7

Concluding remarks, putting it all together, class debate, surveys