

H-115 Cognitive Neuroscience, Psychology, & Education

Harvard Graduate School of Education

Dr. Courtney Pollack

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Logistics

Course time: Tuesdays & Thursdays, 12:00-1:15pm

Course modality: In-person

Course site: [Canvas](#)

Course Communication

Welcome to H115! Please be in touch anytime. We'll respond to email within 24 hours, likely sooner. Please keep this timeline in mind close to assignment deadlines. I welcome meetings and hope that we'll be able to connect outside of class. I look forward to hearing from you and learning about your interests! Please see our Canvas site for TF contact information.

Instructor email: courtney_pollack@gse.harvard.edu; [Calendly \(office hours\)](#)

Course Description

How can the integration of education with the psychological and brain sciences support learning and schooling? The goal of this course is to introduce knowledge and skills that are necessary to evaluate and conduct interdisciplinary work across mind, brain, and education (MBE) sciences. Throughout the course, we will critically examine and build an understanding of MBE research and practice. The course will cover a range of topics, including foundational ideas about learning and schooling; research in educational neuroscience; research-practice translation; misuses of the brain in education; and examples of MBE research across domains. Course sessions will be interactive, with small and whole group discussion, and group activities. Course activities and assignments will target skills that include critical evaluation of research articles, analyses of examples of interdisciplinary work, and communication across formats (i.e., writing, presenting, discussing). The course is geared toward students who are interested in interdisciplinary research and practice that spans education, cognitive neuroscience, psychology, and related fields.

Learning Goals

- ✓ Analyze research across psychology, cognitive neuroscience, and education
- ✓ Articulate strengths, limitations, and examples of integrating psychology, cognitive neuroscience, and education
- ✓ Communicate ideas clearly and succinctly through writing, discussing, and presenting

Course Structure

Course meetings are very interactive. Rare is the lecture. Together, we will actively discuss, analyze, and engage in activities related to the day's topic and readings. There is also a final project on a topic of your choice (with approval). The goal of course activities is to integrate content and skill building, and help further your skills related to the learning goals.

Assignments

The goal of the course assignments is to offer you a variety of opportunities to demonstrate your learning: through discussion, formal and informal written communication, and presentations. All assignments are required and must be turned in on time, so please allow sufficient time to submit. For technical glitches with Canvas, please email the assignment to the teaching team by the deadline. Please be sure to read the Learning in the Continued Time of COVID section on the next page and follow up with the teaching team with any questions.

Participation – 20%

- **Class sessions (10%).** We foster our learning community through discussions and activities during class. We need your contributions! Accordingly, it's very important to attend class sessions, arriving on time, having read and being prepared to discuss the day's content. Participation means cell phones are silenced, and social media, chat windows, and similar are closed. Substantively, participation means active engagement – your thoughtful contributions, and how well you listen to and respond to your classmates. We will work together to foster a friendly and respectful environment, in which all students can share ideas freely. Discussing ideas critically but courteously is a skill, and this class offers ongoing opportunities for us to practice and improve together.
- **Slack (10%).** Slack is an online communication tool that we use throughout the course to discuss ideas, push each other's thinking, and deepen our learning. You're able to more quickly and easily share real-world content that you think is relevant to course discussions and topics, ask questions, clarify course content, and continue conversations throughout the semester. Logistical concerns aside, **students should expect to create substantive posts and comments at least 2-3 times each week.** We aim to have an ongoing, lively exchange of ideas, and for posts to reflect your good thinking about the course content and your classmates' ideas. We aim to avoid surface-level posts or summarized/repeated ideas from the readings/others. The goal is for students to drive the content and posts; the teaching team will read posts and comment and well.

Three analytic short papers – 30% (8%, 10%, 12%)

The goal of writing analytic short papers is to help you analyze, synthesize, distill, and apply takeaways from course topics and readings, and present them clearly and succinctly. Writing succinctly is difficult! But, a very important skill. Short papers are concise (650-750 words), coherent, polished, and use APA style. Short papers should have a thesis and engage with the readings and your own thoughts. The teaching team will provide feedback/grades based on how well papers engage with and synthesize your ideas and ideas from the course; and on coherence, appropriate length, spelling/grammar, and citations. To help students focus on the learning objective for clear, succinct communication, later analytic short papers are weighted heavier than earlier ones.

Final project

The goal of the final project is to apply your learning from the course to your interests. You will have an opportunity to examine a topic of your choosing (with approval) from an interdisciplinary perspective across cognitive neuroscience, psychology, and education. The final project consists of milestones that culminate in a presentation and paper.

- **Final project topic approval**

We look forward to discussing your final project topic interests. As you explore ideas, we ask that you discuss (meeting preferable) with the teaching team at least once and submit an approved research question/topic to Canvas.

- **Annotated Zotero bibliography & synthesis – 10%**

We will use Zotero, free reference management software, to manage references for the final paper. The goal is to help you establish a database of research articles on your topic of interest. It has the added benefit of helping to automate in-text citations and references sections, saving a lot of time. Gutman Library supports the use of Zotero and has an excellent [Zotero Research Guide](#) on how to install and get up-and-running. They also offer [workshops](#) that we encourage you to attend. This assignment will be (1) an exported report of your Zotero library with at least ten references, six with annotations that pertain to your final paper, and 2) a two-page double-spaced synthesis of and reflection on the references.

- **Outline – 5%**

The goals of the outline are to help you translate your ideas into a paper with a logical flow and argument, and allow you to get feedback from the teaching team and from your peers through peer review. The outline should cover the scope of the whole paper and include a draft of one subsection (e.g., a few paragraphs).

- **Presentation – 5%**

At the end of the semester, we will have presentations of final projects. The goals are to practice communicating your work verbally/visually, to provide feedback to your peers when they present, and to receive feedback to incorporate into your final paper. The format will depend on the class size, and may be presentations, lightning talks, or virtual posters. Because presentations come at the end of our course, we cannot accommodate late presentations.

- **Paper – 30%**

The paper should be 8-10 double spaced pages, 1" margins, with 12-point font, and is due **no later than December 14th at 8am EST**. Gutman Library has many resources that we encourage you to use, such as this [Library How-To](#) guide.

Accessibility Policy

If you need academic adjustments or accommodations, please provide me with a letter from [Access & Disabilities Services \(ADS\)](#) and speak with me by the end of the second week of the semester, so that I am able to respond in a timely manner. All discussions will remain confidential, although I may consult ADS to discuss appropriate implementation.

Plagiarism Policy and Guidance

Do not plagiarize; it is a serious academic offense. All of your assignments must be your own, original work. The course assignments require you to draw upon existing research to inform and lend credibility to your arguments. Sometimes students can plagiarize without realizing and we want to prevent this. We urge you to do the following:

- Always cite the source of a finding, idea, or argument that isn't your own, **no matter how much rewording you have done**.
- Always put the findings, ideas, and arguments you cite into your own words, **using your own sentence structure and organization of ideas. If you use others' words, use a direct quote**. It is better to paraphrase (own words, own sentence structure) and cite. If you use others' words, use quotation marks, cite, and include a page number.

If you have any questions about how to ensure that you do not plagiarize, please contact the teaching team for support. We want to help. Plagiarized or improperly cited work will be reported and result in disciplinary action. Penalties for plagiarism can include suspension or expulsion from Harvard. Please be very careful. HGSE has excellent resources for how to cite. We recommend that you bookmark and visit often their [Write & Cite](#) page.

Collaboration Policy and Guidance

Discussion and the exchange of ideas are essential to academic work. We encourage discussion with classmates related to readings, assignments, and final projects. However, you should ensure that any written work you submit for evaluation is the result of your own research and writing and that it reflects your own approach to the topic. When you receive help from others, please include these acknowledgements in your writing. Please adhere to APA citation practices, properly citing any books, articles, websites, lectures, etc. from which you get ideas.

Learning in the Continued Time of COVID-19

- These have been, and will likely continue to be, difficult times that require navigating unforeseen circumstances. We are committed to supporting the wellbeing of students in H115 and at HGSE. There may be times when students experience personal stressors that create barriers to learning. For support, students may contact [HUHS Counseling and Mental Health Services](#).
- For our learning community to thrive, we must attend class, be present and engaged, and move through the work on-time as much as we're able. We must also be flexible when circumstances require. To foster the best learning community, please aim to attend all classes and complete all assignments on time. Should you need to miss a class, please contact the teaching team as soon as possible, **prior to the class session**. To make up that day's participation, please submit to the teaching team a three-page double-spaced synthesis of the day's content, within five days of the missed class. Should something come up prior to an assignment deadline, please contact the teaching team as soon as possible, **before the due date**, so that we may discuss the best way to support you and your learning. Teaching and learning during a pandemic are challenging, and success is a group effort. We look forward to working and learning together to make this course a success.

Course Calendar and Assignment Schedule

Class	Date	Module	Topic	Assignment
1	9/7	Learning and Development	Discussions; Active learning	
2	9/9		Select ideas in educational neuroscience	
3	9/14		Learning, development, & education	
4	9/16	Evidence and Evidence-Based Practice	Psychology & cognitive neuroscience	
5	9/21		Education	
6	9/23		Evidence & equity	Short paper 1 9/24‡
7	9/28	Numerical Cognition as an Example of Educational Neuroscience	Foundations	
8	9/30		Applications	Project topic 10/1‡
9	10/5	Desirable Difficulties	Foundations	
10	10/7		Applications	
11	10/12	Sleep, Adolescence, and School Start Times	Foundations	
12	10/14		Policy implications	Bibliography/ synthesis 10/15‡
13	10/19	Misapplications of MBE	Learning styles	
14	10/21-22§		Myth (or not)?	Short paper 2 10/22‡
15	10/26	Discrimination, Identity, & Well-being	Race-based social stress	
16	10/28		Identity development	
17	11/2	Cognitive Neuroscience in the Classroom	Portable cognitive neuroscience	
18	11/4		Teachers and teacher practice	Outline 11/8‡
19	11/9-10§	Final project	Peer review	
20	11/16	Collaboration & Dissemination	Research-practice-policy	
21	11/18		Research-practice partnerships	Short paper 3 11/22‡
22	11/23		Research translation	
23	11/30	Coming Full Circle	The eternal EN debate	
24	12/2	Final project	TBA	
25	12/7		Student presentations	Presentations in class
Final paper due Tuesday December 14 th by 8 am ET				

‡Assignment due by 11:59pm ET

§Asynchronous class session, see Canvas.

Reading List

You may find the [Harvard citation linker](#) helpful for finding articles.

Learning and Development

Class 1, 9/7, Discussions; Active learning

- Hollander, J. A. (2002). Learning to Discuss: Strategies for Improving the Quality of Class Discussion. *Teaching Sociology*, 30(3), 317–327. <https://doi.org/10.2307/3211480>
- Reuell, P. (2019, September 4). Study shows that students learn more when taking part in classrooms that employ active-learning strategies. *Harvard Gazette*. <https://news.harvard.edu/gazette/story/2019/09/study-shows-that-students-learn-more-when-taking-part-in-classrooms-that-employ-active-learning-strategies/>

Class 2, 9/9, Select ideas in educational neuroscience

- Better learning through educational neuroscience? (2018, March 7). *BOLD*. <https://bold.expert/better-learning-through-educational-neuroscience/>
- Neelen, M., & Kirschner, P. A. (2020, March 3). Stop abusing neuroscience for learning! *3-Star Learning Experiences*. <https://3starlearningexperiences.wordpress.com/2020/03/03/stop-abusing-neuroscience-for-learning/>
- De Smedt, B. (2014). Advances in the use of neuroscience methods in research on learning and instruction. *Frontline Learning Research*, 6, 7–14. <https://doi.org/10.14786/flr.v2i4.115>

Class 3, 9/14, Learning, development, & education

- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>
- Alonso, N. (2021). *The 3 challenges of teaching & learning during the COVID-19 pandemic* (No. 5). Retrieved August 26, 2021, from <https://bold.expert/the-challenges-of-teaching-learning-during-the-covid-19-pandemic/>

Additional module resources for interested students

- + Cesario, J., Johnson, D. J., & Eisthen, H. L. (2020). Your Brain Is Not an Onion With a Tiny Reptile Inside. *Current Directions in Psychological Science*, 0963721420917687. <https://doi.org/10.1177/0963721420917687>
- + Fischer, K. W. (2009). Mind, Brain, and Education: Building a Scientific Groundwork for Learning and Teaching. *Mind, Brain, and Education*, 3(1), 3–16. <https://doi.org/10.1111/j.1751-228X.2008.01048.x>
- + Deslauriers, L., McCarty, L. S., Miller, K., Callaghan, K., & Kestin, G. (2019). Measuring actual learning versus feeling of learning in response to being actively engaged in the classroom. *Proceedings of the National Academy of Sciences*, 116(39), 19251–19257. <https://doi.org/10.1073/pnas.1821936116>
- + National Research Council. (2000). *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*, National Academies Press: Washington, D.C. <https://doi.org/10.17226/9853>
- + National Academies of Sciences, Engineering, and Medicine. (2018). *How People Learn II: Learners, Contexts, and Cultures*, National Academies Press: Washington, D.C. <https://doi.org/10.17226/24783>

Evidence and Evidence-Based Practice

Class 4, 9/16, Psychology & cognitive neuroscience

- Brookman-Byrne, A. (2019, May 24). Translating questionable research to the classroom. Retrieved August 25, 2019, from BOLD website: <https://bold.expert/translating-questionable-research-to-the-classroom/>
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), aac4716. <https://doi.org/10.1126/science.aac4716>
- Gilmore, R. O., Diaz, M. T., Wyble, B. A., & Yarkoni, T. (2017). Progress Toward Openness, Transparency, and Reproducibility in Cognitive Neuroscience. *Annals of the New York Academy of Sciences*, 1396(1), 5–18. <https://doi.org/10.1111/nyas.13325>
- *Optional, but helpful.* Sumeracki, M. (2018). Understanding sample sizes and the word “significant.” Retrieved from The Learning Scientists website: <http://www.learningscientists.org/blog/2018/11/1-1>

Class 5, 9/21, Education

- Ansari, D. (2019, August 7). Paying attention to what doesn't work in the classroom. *BOLD*. <https://bold.expert/paying-attention-to-what-doesnt-work-in-the-classroom/>
- Hedges, L. V., & Schauer, J. (2018). Randomised trials in education in the USA. *Educational Research*, 60(3), 265–275. <https://doi.org/10.1080/00131881.2018.1493350>
- Lortie-Forgues, H., & Inglis, M. (2019). Rigorous large-scale educational RCTs are often uninformative: Should we be concerned? *Educational Researcher*, 48(3), 158–166. <https://doi.org/10.3102/0013189X19832850>

Class 6, 9/23, Evidence & equity

- Brown, C. S., Mistry, R. S., & Yip, T. (2019). Moving from the margins to the mainstream: Equity and justice as key considerations for developmental science. *Child Development Perspectives*, 13(4), 235–240. <https://doi.org/10.1111/cdep.12340>
- *Read pages 1-16.* Chicago Beyond. (2018). Why am I always being researched? A guidebook for community organizations, researchers, and funders to help us get from insufficient understanding to more authentic truth (Volume 1; Equity Series, pp. 1–111). Chicago Beyond.
- Chicago Beyond. (2020). *Why am I always being researched? COVID-19 Edition* (Volume 2; Equity Series, pp. 1–11). Chicago Beyond.

Additional module resources for interested students

- + Klein, R. A., Vianello, M., Hasselman, F., Adams, B. G., Adams, R. B., Alper, S., Aveyard, M., Axt, J. R., Babalola, M. T., Bahník, Š., Batra, R., Berkics, M., Bernstein, M. J., Berry, D. R., Bialobrzeska, O., Binan, E. D., Bocian, K., Brandt, M. J., Busching, R., ... Nosek, B. A. (2018). Many Labs 2: Investigating Variation in Replicability Across Samples and Settings. *Advances in Methods and Practices in Psychological Science*, 1(4), 443–490. <https://doi.org/10.1177/2515245918810225>
- + Roberts, S. O., Bareket-Shavit, C., Dollins, F. A., Goldie, P. D., & Mortenson, E. (2020). Racial Inequality in Psychological Research: Trends of the Past and Recommendations for the Future. *Perspectives on Psychological Science*, 1745691620927709. <https://doi.org/10.1177/1745691620927709>

- + Syed, M., Santos, C., Yoo, H. C., & Juang, L. P. (2018). Invisibility of racial/ethnic minorities in developmental science: Implications for research and institutional practices. *American Psychologist*, 73(6), 812–826. <https://doi.org/10.1037/amp0000294>

Numerical Cognition as an Example of Educational Neuroscience

Class 7, 9/28, Foundations

- De Smedt, B., Noël, M.-P., Gilmore, C., & Ansari, D. (2013). How do symbolic and non-symbolic numerical magnitude processing skills relate to individual differences in children's mathematical skills? A review of evidence from brain and behavior. *Trends in Neuroscience and Education*, 2(2), 48–55. <https://doi.org/10.1016/j.tine.2013.06.001>
- Pollack, C., & Price, G. (2019). Neurocognitive mechanisms of digit processing and their relationship with mathematics competence. *NeuroImage*, 185, 245–254. <https://doi.org/10.1016/j.neuroimage.2018.10.047>

Class 8, 9/30, Applications

- De Smedt, B., & Grabner, R. H. (2014). Applications of Neuroscience to Mathematics Education. In R. Cohen Kadosh & A. Dowker (Eds.), *The Oxford Handbook of Numerical Cognition* (Vol. 1). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199642342.013.48>

Additional module resources for interested students

- + Schneider, M., Beeres, K., Coban, L., Merz, S., Susan Schmidt, S., Stricker, J., & De Smedt, B. (2017). Associations of non-symbolic and symbolic numerical magnitude processing with mathematical competence: A meta-analysis. *Developmental Science*, 20(3), e12372. <https://doi.org/10.1111/desc.12372>
- + Alcock, L., Ansari, D., Batchelor, S., Bisson, M.-J., Smedt, B. D., Gilmore, C., ... Weber, K. (2016). Challenges in mathematical cognition: A collaboratively-derived research agenda. *Journal of Numerical Cognition*, 2(1), 20–41.
- + De Smedt, B. (2020). Sources of variability in mathematical development. In M. S. C. Thomas, D. Mareschal & I. Dumontheil (Eds.) *Educational neuroscience: Development across the life span*. Oxford, UK: Routledge. [Copy available online](#).

Desirable Difficulties

Class 9 10/5, Foundations

- Bloom, K. C., & Shuell, T. J. (1981). Effects of massed and distributed practice on the learning and retention of second-language vocabulary. *The Journal of Educational Research*, 74(4), 245–248.
- Kang, S. H. K. (2016). Spaced repetition promotes efficient and effective learning: Policy implications for instruction. *Policy Insights from the Behavioral and Brain Sciences*, 3(1), 12–19. doi:10.1177/2372732215624708
- Carpenter, S. K., & Kelly, J. W. (2012). Tests enhance retention and transfer of spatial learning. *Psychonomic Bulletin & Review*, 19(3), 443–448. <https://doi.org/10.3758/s13423-012-0221-2>

Class 10, 10/7, Applications

- The Learning Scientists. (2018). *How students can use spacing and retrieval practice*. Retrieved from <http://www.learningscientists.org/learning-scientists-podcast/2018/3/7/episode-14-how-students-can-use-spacing-and-retrieval-practice>
- Sumeracki, M. A. (2019, December 9). The Case for Applying Cognitive Psychology in Your Classroom—EdSurge News. *EdSurge*. <https://www.edsurge.com/news/2019-12-09-the-case-for-applying-cognitive-psychology-in-your-classroom>

We will continue to engage with some of the readings from the prior class.

Additional module resources for interested students

- + Education Endowment Foundation. (2021). *Cognitive science approaches in the classroom: A review of the evidence* (pp. 1-51). University of Birmingham. https://educationendowmentfoundation.org.uk/public/files/Publications/Cognitive_science_approaches_in_the_classroom_-_A_review_of_the_evidence.pdf
- + Wing, E. A., Marsh, E. J., & Cabeza, R. (2013). Neural correlates of retrieval-based memory enhancement: An fMRI study of the testing effect. *Neuropsychologia*, 51(12), 2360–2370. <https://doi.org/10.1016/j.neuropsychologia.2013.04.004>
- + Feng, K., Zhao, X., Liu, J., Cai, Y., Ye, Z., Chen, C., & Xue, G. (2019). Spaced learning enhances episodic memory by increasing neural pattern similarity across repetitions. *The Journal of Neuroscience*, 39(27), 5351–5360. doi:10.1523/JNEUROSCI.2741-18.2019

Sleep, Adolescence, and School Start Times

Class 11, 10/12, Foundations

- Carskadon, M. A., & Tarokh, L. (2014). Developmental changes in sleep biology and potential effects on adolescent behavior and caffeine use. *Nutrition Reviews*, 72(Suppl 1), 60–64. <https://doi.org/10.1111/nure.12147>
- Dunster, G. P., Iglesia, L. de la, Ben-Hamo, M., Nave, C., Fleischer, J. G., Panda, S., & Iglesia, H. O. de la. (2018). Sleepmore in Seattle: Later school start times are associated with more sleep and better performance in high school students. *Science Advances*, 4(12), eaau6200. <https://doi.org/10.1126/sciadv.aau6200>
- Kelley, P., Lockley, S. W., Kelley, J., & Evans, M. D. R. (2017). Is 8:30 a.m. still too early to start school? A 10:00 a.m. school start time improves health and performance of students aged 13–16. *Frontiers in Human Neuroscience*, 11. <https://doi.org/10.3389/fnhum.2017.00588>

Class 12, 10/14, Policy implications

- Watson, N. F., Martin, J. L., Wise, M. S., Carden, K. A., Kirsch, D. B., Kristo, D. A., Malhotra, R. K., Olson, E. J., Ramar, K., Rosen, I. M., Rowley, J. A., Weaver, T. E., & Chervin, R. D. (2017). Delaying Middle School and High School Start Times Promotes Student Health and Performance: An American Academy of Sleep Medicine Position Statement. *Journal of Clinical Sleep Medicine*, 13(04), 623–625. <https://doi.org/10.5664/jcsm.6558>
- Hauser, C., & Kwai, I. (2019, October 14). California Tells Schools to Start Later, Giving Teenagers More Sleep. *The New York Times*. <https://www.nytimes.com/2019/10/14/us/school-sleep-start.html>
- Mijares, A. (2019, October 4). *Later school start times is no solution for teenagers*. CalMatters. <https://calmatters.org/commentary/2019/10/later-school-start-times-is-no-solution-for-teenagers/>

Additional module resources for interested students

- + Goldin, A. P., Sigman, M., Braier, G., Golombek, D. A., & Leone, M. J. (2020). Interplay of chronotype and school timing predicts school performance. *Nature Human Behaviour*, 4(4), 387–396. <https://doi.org/10.1038/s41562-020-0820-2>
- + Lenard, M., Morrill, M. S., & Westall, J. (2020). High school start times and student achievement: Looking beyond test scores. *Economics of Education Review*, 76, 101975. <https://doi.org/10.1016/j.econedurev.2020.101975>
- + Wolfson, A. R., & Carskadon, M. A. (1998). Sleep schedules and daytime functioning in adolescents. *Child Development*, 69(4), 875–887.

Misapplications of MBE

Class 13, 10/19, Learning styles

- Cuevas, J. A. (2016, July 11). Is research-based instruction a reality in education? The example of learning styles and dual coding. Retrieved from Psych Learning Curve website: <http://psychlearningcurve.org/learning-styles/>
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119. <https://doi.org/10.1111/j.1539-6053.2009.01038.x>
- Rogowsky, B. A., Calhoun, B. M., & Tallal, P. (2020). Providing Instruction Based on Students' Learning Style Preferences Does Not Improve Learning. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.00164>

Class 14, 10/21-10/22, Myth (or not)?

- Please see Canvas module for information about this session.

Additional module resources for interested students

- + Fallace, T. (2019). The ethnocentric origins of the learning style idea. *Educational Researcher*, 0013189X19858086. <https://doi.org/10.3102/0013189X19858086>
- + Newton, P. M. (2015). The learning styles myth is thriving in higher education. *Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015.01908>
- + Belief in learning styles myth may be detrimental. (2019). Retrieved August 25, 2019, from <https://www.apa.org> website: <https://www.apa.org/news/press/releases/2019/05/learning-styles-myth>
- + Sullivan, K. A., Hughes, B., & Gilmore, L. (2021). Measuring educational neuromyths: Lessons for future research. *Mind, Brain, and Education*. <https://doi.org/10.1111/mbe.12294>

Discrimination, Identity, & Well-being

Class 15, 10/26, Race-based social stress

- Levy, D. J., Heissel, J. A., Richeson, J. A., & Adam, E. K. (2016). Psychological and biological responses to race-based social stress as pathways to disparities in educational outcomes. *The American Psychologist*, 71(6), 455–473. <https://doi.org/10.1037/a0040322>

- Heissel, J. A., Levy, D. J., & Adam, E. K. (2017). Stress, Sleep, and Performance on Standardized Tests: Understudied Pathways to the Achievement Gap. *AERA Open*, 3(3), 2332858417713488. <https://doi.org/10.1177/2332858417713488>

Class 16, 10/28, Identity development

- Schachner, M. K. (2019, April 15). "I learned to see my students with different eyes." Retrieved from BOLD website: <https://bold.expert/i-learned-to-see-my-students-with-different-eyes/>
- Umaña-Taylor, A. J., Douglass, S., Updegraff, K. A., & Marsiglia, F. F. (2018). A Small-Scale Randomized Efficacy Trial of the Identity Project: Promoting Adolescents' Ethnic–Racial Identity Exploration and Resolution. *Child Development*, 89(3), 862–870. <https://doi.org/10.1111/cdev.12755>

Additional module resources for interested students

- + Fuller-Rowell, T. E., Evans, G. W., & Ong, A. D. (2012). Poverty and health: The mediating role of perceived discrimination. *Psychological Science*, 23(7), 734–739. <https://doi.org/10.1177/0956797612439720>
- + Leath, S., Mathews, C., Harrison, A., & Chavous, T. (2019). Racial identity, racial discrimination, and classroom engagement outcomes among black girls and boys in predominantly black and predominantly white school districts. *American Educational Research Journal*, 56(4), 1318–1352. <https://doi.org/10.3102/0002831218816955>
- + Harnett, N. G., Wheelock, M. D., Wood, K. H., Goodman, A. M., Mrug, S., Elliott, M. N., ... Knight, D. C. (2019). Negative life experiences contribute to racial differences in the neural response to threat. *NeuroImage*, 202, 116086. <https://doi.org/10.1016/j.neuroimage.2019.116086>

Cognitive Neuroscience in the Classroom

Class 17, 11/2, Portable cognitive neuroscience

- van Atteveldt, N., Janssen, T. W. P., & Davidesco, I. (2020). Measuring Brain Waves in the Classroom. *Frontiers for Young Minds*, 8, 96. <https://doi.org/10.3389/frym.2020.00096>
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- Dikker, S., Wan, L., Davidesco, I., Kaggen, L., Oostrik, M., McClintock, J., Rowland, J., Michalareas, G., Van Bavel, J. J., Ding, M., & Poeppel, D. (2017). Brain-to-Brain Synchrony Tracks Real-World Dynamic Group Interactions in the Classroom. *Current Biology*, 27(9), 1375–1380. <https://doi.org/10.1016/j.cub.2017.04.002>

Class 18, 11/4, Teachers and teacher practice

- Brookman-Byrne, A. (2019, October 17). Teachers learn about neuroscience. *BOLD*. <https://bold.expert/teachers-learn-about-neuroscience/>
- Coch, D. (2018). Reflections on neuroscience in teacher education. *Peabody Journal of Education*, 93(3), 309–319. <https://doi.org/10.1080/0161956X.2018.1449925>
- Dubinsky, J. M., Guzey, S. S., Schwartz, M. S., Roehrig, G., MacNabb, C., Schmied, A., ... Cooper, J. L. (2019). Contributions of neuroscience knowledge to teachers and their practice. *The Neuroscientist*, 1073858419835447. <https://doi.org/10.1177/1073858419835447>

Additional module resources for interested students

- + EARLI. (2020). *Portable Brain Technologies in Educational Research*. EARLI. Retrieved August 18, 2020, from <https://earli.org/efg-01>

Final Project

Class 19, 11/9-11/10, Peer review

- Please see Canvas module for information about this session.

Collaboration and Dissemination

Class 20, 11/16, Research-practice-policy

Guest: Joan Wasser-Gish, JD

- Bayer, M. (2020). *Distilling Research into Narratives to Inspire Policy Action with Joan Wasser Gish* (No. 69). <https://whensciencespeaks.com/podcast/69-distilling-research-into-narratives-to-inspire-policy-action-ep-69/>
- Wasser-Gish, J. (2019). *Building Systems of Integrated Student Support: A Policy Brief for Local and State Leaders*. America's Promise Alliance. https://www.americaspromise.org/sites/default/files/d8/ISSreport_v7.pdf

Class 21, 11/18, Research-practice partnerships

Guest: Dr. Elizabeth Toomarian

- Mix, K. S., & Kalish, C. (2019). Foreword to the special issue: Found in translation. *Journal of Cognition and Development*, 20(2), 107–109. <https://doi.org/10.1080/15248372.2019.1605997>
- McCandliss, B., & Toomarian, E. (2020, April 13). Putting Neuroscience in the Classroom: How the Brain Changes as We Learn. *Trend Magazine, Spring 2020*(5). <https://pew.org/2UoSzWN>
- Foisy, L.-M. B., Matejko, A. A., Ansari, D., & Masson, S. (n.d.). Teachers as Orchestrators of Neuronal Plasticity: Effects of Teaching Practices on the Brain. *Mind, Brain, and Education*, n/a(n/a). <https://doi.org/10.1111/mbe.12257>
- *Stanford's Brainwave Learning Center*. (2019, August 7). <https://www.youtube.com/watch?v=F41GkUAuAW4> [Alternate video on Canvas]

Class 22, 11/23, Research translation

Guest: Dr. Annie Brookman-Byrne

- Brookman-Byrne, A. (2019, June 25). School-based advocates for evidence: Can school 'Research Leads' improve education? Retrieved from BOLD website: <https://bold.expert/school-based-advocates-for-evidence/>
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Additional module resources for interested students

- + Deans for Impact. (2015). *The Science of Learning*. Deans for Impact. https://deansforimpact.org/wp-content/uploads/2016/12/The_Science_of_Learning.pdf
- + Hobbiss, M. H., Massonnié, J., Tokuhama-Espinosa, T., Gittner, A., Lemos, M. A. de S., Tovazzi, A., Hindley, C., Baker, S., Sumeracki, M. A., Wassenaar, T., & Gous, I. (2019). "UNIFIED": Bridging the Researcher–Practitioner Divide in Mind, Brain, and Education. *Mind, Brain, and Education*, 13(4), 298–312. Doi: 10.1111/mbe.12223 <https://doi.org/10.1111/mbe.12223>

- + Sauerwein, M. (2019, August 26). Can educators and researchers work together to promote school development? *BOLD*. <https://bold.expert/can-educators-and-researchers-work-together-to-promote-school-development/>
- + O’Neil, L. V., Pakulak, E., Stevens, C., Bell, T. A., Fanning, J. L., Gaston, M., ... Neville, H. (2019). Creating connections between researchers and educators. *Journal of Cognition and Development*, 20(2), 110–133. <https://doi.org/10.1080/15248372.2018.1515078>

Coming Full Circle

Class 23, 11/30, The eternal EN debate

- Bowers, J. S. (2016). The practical and principled problems with educational neuroscience. *Psychological Review*, 600–612. <https://doi.org/10.1037/rev0000025>
- Howard-Jones, P. A., Varma, S., Ansari, D., Butterworth, B., De Smedt, B., Goswami, U., ... Thomas, M. S. C. (2016). The principles and practices of educational neuroscience: Comment on Bowers (2016). *Psychological Review*, 123(5), 620–627. <https://doi.org/10.1037/rev0000036>
- Gabrieli, J. D. E. (2016). The promise of educational neuroscience: Comment on Bowers (2016). *Psychological Review*, 123(5), 613–619. <https://doi.org/10.1037/rev0000034>
- Brookman-Byrne, A. (2019, July 12). Fighting for educational neuroscience. <https://bold.expert/fighting-for-educational-neuroscience/>

Additional module resources for interested students

- + Bowers, J. S. (2016). Psychology, not educational neuroscience, is the way forward for improving educational outcomes for all children: Reply to Gabrieli (2016) and Howard-Jones et al. (2016). *Psychological Review*, 123(5), 628–635. <https://doi.org/10.1037/rev0000043>
- + Thomas, M. S. C., Ansari, D., & Knowland, V. C. P. (2018). Annual research review: Educational neuroscience: progress and prospects. *Journal of Child Psychology and Psychiatry*. <https://doi.org/10.1111/jcpp.12973>

Final Project

Class 24, 12/2, TBA

- Please see Canvas modules for information about this session.

Class 25, 12/7, Student presentations

- Please see Canvas modules for information about this session.