

Cognitive Development
Psychology 455, Fall 2018
9/17/18: Syllabus version 1.2

Time: Tuesdays and Thursdays
2:00 to 3:15 pm
Location: BPS 1238 (will change)
Website: <http://elms.umd.edu>

Instructor: Dr. Jonathan Beier
Email: jsbeier@umd.edu
Office hours: By appointment,
BPS 2147E (please email to set a time)

Course description

This advanced undergraduate seminar explores the development of cognition, focusing primarily on birth through the first few years of life. In this course, we will first review infants' core cognitive faculties in several domains of knowledge: objects, quantity, agents, and language. Continuing, we will consider some of the ways that knowledge is organized, remembered, enriched, and changed. From here, we will examine children's abilities to figure things out and to learn from others. The course will conclude with a discussion of factors that influence children's abilities to learn, in both formal and informal environments. Although our emphasis is cognitive development, we will incorporate insights from comparative psychology, adult psychology, neuroscience, and cross-cultural psychology, to better appreciate how different research approaches inform one another and contribute to a more comprehensive understanding of cognitive psychology overall.

Success in this class is simple. Engage the readings, fully. Come to class. Participate in discussions. Participate in discussions (really). Submit your assignments on time; make them thoughtful. And ask for help if you need it.

Grading

Percentage of grade	Activity	When?
20	Class participation	Every class day
20	Discussion posts	5 pm on the night before class, starting for class on 9/4
15	Discussion leading	One class day (probably)
2	Reflection on cognitive development, <i>Part 1</i>	11:59 pm on 9/3
3	Reflection on cognitive development, <i>Part 2</i>	5:00 pm on 12/4
5	QALMRI #1: Reading for class	Start of class on 10/16
5	QALMRI #2: Media critique	Start of class on 11/15
30	Final paper	TBD by final exam schedule

Learning outcomes

Students will:

- Learn about foundational theories and discoveries in the field of cognitive development, as well as cutting-edge topics under active investigation by contemporary researchers.
- Gain practice with engaging the primary empirical literature. Students will read original scientific reports on their own, summarize their findings during individual in-class presentations, and discuss them critically during class meetings. The ability to succinctly summarize and assess an empirical paper will also be evaluated through two homework assignments.
- Observe how individual empirical studies contribute to theory-building in the field of cognitive development.
- Learn to assess the accuracy and completeness of popular media reports of scientific discoveries. This theme will be incorporated in ongoing class discussions, and students will have the opportunity during one homework assignment to critically analyze the correspondence between a popular media article and the scientific report on which it is based.
- Gain experience generating their own research ideas, refining the logic of a study proposal, and communicating both the motivation and plans for implementing a new research project, via a final paper assignment.

Names/Pronouns and Self Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Inclusive Learning Environment

Students will be invited to share their thoughts in class and a diversity of opinions is welcome. Respectful communication is expected, even when expressing differing perspectives. Supporting one's statements with research findings is encouraged. In accordance with free speech statutes, speech that contains threats of violence is prohibited.

Policy on late assignments

If they are late, written assignments will rapidly lose their value to you.

If an assignment arrives within 24 hours of when it is due, the grade will be reduced by 10%; deductions of 20% and 30% will occur if it arrives on the second or third day, respectively. After that, late assignments will not be accepted.

If your online discussion post does not appear before **5 pm** the night before class, you will not receive credit for it.

More on assignments

Class participation (20%):

- Be prepared and be engaged!
- I will take notes each day on each student's attendance and participation in the discussion. You should contribute something each day, but keep in mind that quality is more important than quantity.

Online discussion posts (20%):

- Before each class session you will post a short response to that day's readings on the ELMS discussion board for the class.
- Your posts are due by **5 pm** the night before class. This is important because the discussion leader(s) for that day and I must have time to review your posts and think about how to include the issues you have raised.
- Read through other students' posts! You'll learn a lot from each other's reactions. In your post, you are welcome to refer to posts made by your peers, but be advised that if the discussion has gone far afield you might not want to follow it there.
- Posts should be about a paragraph long at *minimum* (~200 words). Although only one is required, you should feel free to make multiple posts; but if you do, make sure that at least one of them meets this length.
- Don't summarize the readings beyond providing enough detail for us to know what you're referring to. We've all read the papers, so add something new. Obvious use of summaries to fill up the word count will work against you.
- In order to receive full credit, you will have to go beyond statements such as "I thought X was interesting" or "I didn't understand Y." Of course, these are reasonable starting points for your comments, but you shouldn't stop here! For instance, "I thought X's finding was interesting because it contradicted Y's theory that..."; or, "I didn't understand Y's conclusion because the data really seemed to suggest that..."; or, "I think X experiment is related to an article I read in a previous class because Y..."; or, "In future work, it would be important to know X because otherwise Y..."

Discussion leading (15%):

- You will be responsible for leading the day's discussion at least once during the semester. I will determine the number of sessions to be lead once enrollment is final. There are several parts to this role:
 - You will present a **SHORT** summary of one of the empirical research articles assigned for that day.
 - Prior to class, you will compile a list of the thoughtful comments made by your peers online, to be used as starting points for discussion during class. Look for themes across multiple students' posts, common points of confusion, and particularly insightful comments by individual students.
 - During class, I will primarily lead discussion of the overview readings (i.e., not your assigned empirical article), but I will also give the discussion leaders an opportunity to comment on the day's readings as a whole. In addition to offering their own thoughts, they will help guide the discussion by asking other students to restate their points made online.
 - I will provide more information regarding expectations for discussion leading and presenting in a separate document.

Reflection on cognitive development (5%):

- To encourage you to think about the big picture framing of the class, you will write two short reflection pieces: once at the beginning of the semester and once at its end.
- Part 1 is an opportunity for you to reflect on your initial appreciation for what cognitive development involves, what sorts of questions about the human experience we can address by studying it, and what methods we can use to do so. I would like to see you identify a big question that you hope to learn more about during the semester – this may help you in your selection of topics for written assignments, as they will be opportunities to dig deeper in that area. You will not be graded for what you don't know (naturally!), but I will be looking for thoughtful reflections from whatever point of understanding at which you've already arrived.
 - It should be two double-spaced pages, submitted via ELMS.
 - It is due before **midnight** on the evening of Monday, 9/3.
- Part 2 is an opportunity for you to review what you have learned over the course of the semester, both in general and on the specific question identified in Part 1. For this portion of the assignment, you should expand on, revise, and/or rewrite what you submitted for Part 1, now including whatever insights you have gained during the semester.
 - It should be three double-spaced pages, submitted via ELMS.
 - It is due by **5 pm** on Tuesday, 12/4.
 - We will discuss your reflections during our final class meeting on 12/6.

QALMRI 1: Reading for class (5%):

- Each student will write one QALMRI analysis of an empirical paper we read for class.
- I will offer a small selection of papers, from which you can choose. More details on this assignment will be provided on ELMS.
- This assignment is due in two places: 1) in hardcopy at the start of class, and 2) digitally, via ELMS.

QALMRI 2: Popular media critique (5%):

- Cognitive development is a hot topic in the media. Sometimes journalists do an excellent job of portraying the scientific process and findings; other times, they fail miserably.
- Each student will find a newspaper- or magazine-length article on some aspect of cognitive development and provide a critical evaluation of what the author does or does not do well.
- The aspect of development covered may be one we have touched upon in class, but it does not have to be. However, it must be related to the broad course theme. To make sure the topic is acceptable, please email me via ELMS once you choose your article.
- The critique will have two parts:
 1. A one-page, double-spaced summary of the article and the student's evaluation of it.
 2. A QALMRI summary of the original research article on which the popular article is based. If the popular article is based on multiple scientific articles, then you should select one that is of central importance to the popular article's discussion.
- This assignment is due in two places: 1) in hardcopy at the start of class, and 2) digitally, via ELMS.

Final paper (30%):

- At the end of the semester, you will turn in a proposal for a new study in the area of cognitive development. It must be 12 pages, double spaced, APA format, and without tortured margins.
- The study you propose should make contact with at least one of the topics that we discussed in class.
 - I **STRONGLY** recommend you take notes each week on paper topic ideas that relate to the readings, as they occur to you. If you are doing the readings properly, you will have dozens of good ideas to select from by the time it comes to choose a topic.
- The paper will be roughly in the format of a journal article, though of course without data: you'll have an introduction, methods section, planned analyses, and a thorough discussion of possible results and their implications. More details will be provided as the deadline approaches.
- Final papers are due during the final exam period, at the time designated for classes meeting when ours does (TBD).

Date	Unit	Topic
8/28	Intro	Intro and organization
8/30		What is cognitive psychology?
9/4	Core cognition of the physical world	Depth
9/6		Objects 1 (Nativism and empiricism)
9/11		Objects 2 (Solidity and matter)
9/13		Objects 3 (Gravity)
9/18		Magnitude
9/20		Core cognition of the social world
9/25	Agents	
9/27	How language sounds	
10/2	How language works	
10/4	Information representation	Words and concepts
10/9		Memory
10/11		NO CLASS
10/16		Essentialism
10/18		Symbols
10/23		Natural number
10/25		Learning and understanding
10/30	Causal reasoning	
11/1	Imitation	
11/6	Instruction	
11/8	Scientific reasoning	
11/13	Play	
11/15	Achievement	Effort
11/20		Self-Control
11/22		NO CLASS - Thanksgiving
11/27		Gender and Math Stereotypes
11/29		School interventions
12/4		Semester overview
12/6	Wrap-up discussion	

Academic Integrity

Academic integrity is a serious matter, and the Department of Psychology has a zero-tolerance policy towards academic dishonesty. Please review our statement on the ethics of scholarship, appended to this syllabus.

Excused absences

University of Maryland policy dictates that a single absence during the semester due to illness or injury will be excused with a signed letter attesting to the date of the illness and acknowledging that the information is true and correct. You are required to contact me by email prior to the class meeting if you expect to be absent for any reason, especially due to illness or injury, and to provide this form by the next class meeting that you are present for:

<http://www.health.umd.edu/sites/default/files/ClassExcuse1011.pdf>

Multiple absences, and those occurring on a major scheduled grading event (<http://president.umd.edu/policies/docs/V-100G.pdf>), require written documentation of the illness or injury from the Health Center or an outside health care provider. The letter must verify the dates of treatment and the time period during which you were unable to meet academic responsibilities. Accommodations will be arranged on a case-by-case basis.

A grade of zero will be assigned for any assessment missed with an unexcused or undocumented absence.

Electronic devices

Laptops and tablets may be used for note-taking or to view digital copies of the assigned reading during times when the instructor is leading the class. If I suspect that some of you are using your electronic devices for other purposes, such as email, messaging, web browsing, or Facebook, I may decide to ban these devices.

During presentations by student discussion leaders, no electronic devices are permitted (except when required for DSS accommodations).

Further information:

Please visit the University's Course Related Policies website:
<http://www.ugst.umd.edu/courserelatedpolicies.html>

Class Outline

Note: I recommend that you engage the readings in the order that they are listed here. Also, readings are subject to revision as the course proceeds!

August 28: Introduction and organization

August 30: Cognitive Psychology in perspective

- Pinker, S. (1997). Standard equipment. In *How the mind works*. WW Norton & Company.
- Fantz, R. L. (1963). Pattern vision in newborn infants. *Science*, 140(3564), 296-297.
- Kosslyn, S.M. & Rosenberg, R.S. (2001). QALMRI Instructions.

September 4: Depth perception

- Spelke, E. S. (1990). Origins of visual knowledge. In *An Invitation to Cognitive Science: Visual cognition and action* (Vol. 2, pp. 99-127).
- Slater, A., Mattock, A., & Brown, E. (1990). Size constancy at birth: Newborn infants' responses to retinal and real size. *Journal of Experimental Child Psychology*, 49(2), 314-322.

September 6: Objects 1 – Nativism and empiricism

- Haith, M. M. (1998). Who put the cog in infant cognition? Is rich interpretation too costly? *Infant Behavior and Development*, 21(2), 167-179.
- Spelke, E. S. (1998). Nativism, empiricism, and the origins of knowledge. *Infant Behavior and Development*, 21(2), 181-200.
- Valenza, E., Leo, I., Gava, L., & Simion, F. (2006). Perceptual completion in newborn human infants. *Child Development*, 77(6), 1810-1821.

September 11: Objects 2 – Solidity and matter

- Shtulman, A. (2017). Matter. In *Scienceblind: Why Our Intuitive Theories About the World Are So Often Wrong*. Basic Books.
- Feigenson, L., & Carey, S. (2005). On the limits of infants' quantification of small object arrays. *Cognition*, 97(3), 295-313.

September 13: Objects 3 – Gravity

- Shtulman, A. (2017). Gravity. In *Scienceblind: Why Our Intuitive Theories About the World Are So Often Wrong*. Basic Books.
- Stahl, A. E., & Feigenson, L. (2015, April). Observing the unexpected enhances infants' learning and exploration. *Science (New York, N.Y.)*, 348(6230), 91-94.

September 18: Magnitude

- Dehaene, S. (2011). Talented and gifted animals. In *The number sense: How the mind creates mathematics* (pp. 13-40). Oxford University Press.
- Izard, V., Sann, C., Spelke, E. S., & Streri, A. (2009). Newborn infants perceive abstract numbers. *Proceedings of the National Academy of Sciences*, *106*(25), 10382.

September 20: Faces

- Johnson, M. H. (2005). Subcortical face processing. *Nat Rev Neurosci*, *6*(10), 766-74.
- Bar-Haim, Y., Ziv, T., Lamy, D., & Hodes, R. M. (2006). Nature and nurture in own-race face processing. *Psychological Science*, *17*(2), 159.

September 25: Agents

- Woodward, A. L. (2009). Infants learning about intentional action. In A. L. Woodward & A. Needham (Eds.), *Learning and the infant mind* (Vol. 1, pp. 227-249). Oxford: Oxford University Press.
- Sommerville, J. A., Woodward, A. L., & Needham, A. (2005). Action experience alters 3-month-old infants' perception of others' actions. *Cognition*, *96*(1), B1-11.

September 27: How language sounds

- Werker, J. F., & Tees, R. C. (1984). Cross-language speech perception: Evidence for perceptual reorganization during the first year of life. *Infant Behavior and Development*, *7*(1), 49-63.
- Maurer, D., & Werker, J. F. (2014). Perceptual narrowing during infancy: A comparison of language and faces. *Developmental Psychobiology*, *56*(2), 154-78.

October 2: How language works

- Pinker, S. (1994). How language works. In *The language instinct: The new science of language and mind* (pp. 83-125). Penguin.
- Senghas, A., Kita, S., & Özyürek, A. (2004). Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science*, *305*(5691), 1779-1782.

October 4: Words and concepts

- Arunachalam, S., & Waxman, S. R. (2010). Language and conceptual development. *Wiley Interdisciplinary Reviews: Cognitive Science*, *1*, 548-558.
- Hespos, S. J., & Spelke, E. S. (2004). Conceptual precursors to language. *Nature*, *430*(6998), 453-6.

October 9: Memory

- Bauer, P. J., Larkina, M., & Deocampo, J. (2011). Early memory development. In Goswami (Ed.), *The wiley-blackwell handbook of childhood cognitive development* (Vol. 2, pp. 153-179).
- Simcock, G., & Hayne, H. (2002). Breaking the barrier? Children fail to translate their preverbal memories into language. *Psychological Science*, *13*(3), 225-231

October 11: NO CLASS

October 16: Essentialism

- Gelman, S. A. (2004). Psychological essentialism in children. *Trends in Cognitive Sciences*, *8*(9), 404-9.
- Rhodes, M., Leslie, S. J., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proc Natl Acad Sci U S A*, *109*(34), 13526-31.
- Waxman, S. R. (2012). Social categories are shaped by social experience. *Trends in Cognitive Sciences*, *16*(11), 531-532.

October 18: Symbols

- DeLoache, J. S. (2004). Becoming symbol-minded. *Trends in Cognitive Sciences*, *8*(2), 66-70.
- DeLoache, J. S., Miller, K. F., & Rosengren, K. S. (1997). The credible shrinking room: Very young children's performance with symbolic and nonsymbolic relations. *Psychological Science*, *8*(4), 308-313.
- DeLoache, J. S., Uttal, D. H., & Rosengren, K. S. (2004). Scale errors offer evidence for a perception-action dissociation early in life. *Science*, *304*(5673), 1027-1029.

October 23: Natural number

- Sarnecka, B. W. (2016). How numbers are like the earth (and unlike faces, loitering, or knitting). In D. Barner & A. Baron (Eds.), *Core knowledge and conceptual change* (pp. 151-170). New York: Oxford University Press
- Gordon, P. (2004). Numerical cognition without words: Evidence from amazonia. *Science*, *306*(5695), 496-9.

October 25: Statistical reasoning

- Xu, F., & Kushnir, T. (2013). Infants are rational constructivist learners. *Current Directions in Psychological Science*, *22*(1), 28-32.
- Xu, F., & Denison, S. (2009). Statistical inference and sensitivity to sampling in 11-month-old infants. *Cognition*, *112*(1), 97-104.

October 30: Causal inference

- Saxe, R., Tenenbaum, J. B., & Carey, S. (2005). Secret agents: Inferences about hidden causes by 10-and 12-month-old infants. *Psychological Science*, 995-1001.
- Bonawitz, E. B., Ferranti, D., Saxe, R., Gopnik, A., Meltzoff, A. N., Woodward, J., & Schulz, L. E. (2010). Just do it? Investigating the gap between prediction and action in toddlers' causal inferences. *Cognition*, 115(1), 104-17.

November 1: Imitation

- Gopnik, A. (2016). Learning through looking. In *The gardener and the carpenter: What the new science of child development tells us about the relationship between parents and children*. Macmillan.
- Gergely, G., Bekkering, H., & Király, I. (2002). Rational imitation in preverbal infants. *Nature*, 415(6873), 755.

November 6: Instruction

- Gopnik, A. (2016). Learning through listening. In *The gardener and the carpenter: What the new science of child development tells us about the relationship between parents and children*. Macmillan.
- Koenig, M. A., Clément, F., & Harris, P. L. (2004). Trust in testimony: Children's use of true and false statements. *Psychological Science*, 15(10), 694-698.

November 8: Scientific Reasoning

- *We will be joined by Prof. Lucas Butler (Human Development)*.
- Butler, L. TBD.

November 13: Play

- Gopnik, A. (2016). The work of play. In *The gardener and the carpenter: What the new science of child development tells us about the relationship between parents and children*. Macmillan.
- Bonawitz, E., Shafto, P., Gweon, H., Goodman, N. D., Spelke, E., & Schulz, L. (2011). The double-edged sword of pedagogy: Instruction limits spontaneous exploration and discovery. *Cognition*, 120(3), 322-30.

November 15: Effort and perseverance

- Leonard, J. A., Lee, Y., & Schulz, L. E. (2017). Infants make more attempts to achieve a goal when they see adults persist. *Science*, 357(6357), 1290-1294.
- White, R. E., Prager, E. O., Schaefer, C., Kross, E., Duckworth, A. L., & Carlson, S. M. (2017). The "Batman Effect": Improving perseverance in young children. *Child development*, 88(5), 1563-1571.

November 20: Self-control

- Kidd, C., Palmeri, H., & Aslin, R. N. (2013). Rational snacking: Young children's decision-making on the marshmallow task is moderated by beliefs about environmental reliability. *Cognition*, 126(1), 109-114.
- [one more, TBD]

November 22: NO CLASS – Thanksgiving

November 27: Gender and Stereotypes

- Chestnut, E. K., Lei, R. F., Leslie, S. J., & Cimpian, A. (2018). The myth that only brilliant people are good at math and its implications for diversity. *Education Sciences*, 8(2), 65.
- Bian, L., Leslie, S. J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, 355(6323), 389-391.

November 29: School interventions

- WATCH (8 minutes): <https://youtu.be/RWdiQjevvVc>
- Dillon, M. R., Kannan, H., Dean, J. T., Spelke, E. S., & Duflo, E. (2017). Cognitive science in the field: A preschool intervention durably enhances intuitive but not formal mathematics. *Science*, 357(6346), 47-55.

December 4: TBD

December 6: Wrap-up discussion