Cognitive Development
Psychology 455, Fall 2014

Time: Tuesdays and Thursdays
2:00 to 3:15 pm
Location: SQH 2119
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 developments from birth through the first few years of life. In this course, we will first review infants' conceptual development in several domains of knowledge: objects, quantity, and agents. We will then pursue an extended study of language development, arriving not just at an understanding of how language works and is acquired, but how language influences conceptual thought. Continuing, we will consider how knowledge is organized, remembered, enriched, and changed. Although our emphasis is cognitive development, we will incorporate insights from comparative psychology, adult psychology, neuroscience, and cross-cultural psychology in order to fully characterize the foundations of these cognitive processes and the mechanisms for their ensuing development. Equally, we will return repeatedly to the notion that only a study of development can provide a full portrait of cognition in adults.

Success in this class is simple. Do the readings. 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

- Class participation (20%)
- Online discussion posts (20%)
- Discussion leading (10%)
- Written QALMRI analysis (10%)
- Final paper presentation (10%)
- Final paper (30%)

Extra Credit option, TBA: +1 point on final grade

Policy on late assignments

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

If your online discussion post does not appear before **7 pm** the night before class, you will not receive credit for it.

QALMRI papers are due at the **start of class** one week following your in-class presentation. Final papers are due by **midnight** on the evening of Wednesday, December 17th. If an assignment arrives within 24 hours after these times, 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.

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 **7 pm** the night before class. This is important because the discussion leader(s) for that day 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* (~150 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.
- You don't need to summarize the readings beyond providing enough detail for us to know what you're referring to. We've all read the papers, so get to the point.
- 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 (10%):

- You will be responsible for leading the day's discussion at various points during the semester. 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 both themes across multiple students' posts and particularly insightful comments by individual students.
    - During class, I will 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 guide the discussion by asking other students to restate their points made online.
- The final assignment of students to days for discussion leading depends upon final enrollment in the class. I anticipate 1 or 1.5 days of leading per person.

Written QALMRI analysis (10%):

- Each student will write one QALMRI analysis of an empirical paper they described while leading the discussion.
- Since you may lead discussion more than once, and because some days include multiple empirical papers, you may have your choice of which paper to write about.
- QALMRI papers are due at the start of class, in hardcopy, one week after the class in which you presented that empirical paper. You should also submit a copy via ELMS.

Final paper presentation (10%):

- I've set aside four class days towards the end of the semester for Final paper presentations. By this point in the semester, you should have begun making concrete plans for the topic of your paper. The presentation is your chance to get feedback for these plans, from your peers and from me.
- Because there will be many of them, paper presentations should be brief. Exact timings will be determined by the number of students who need to present, but expect about 10 minutes for presentation and class discussion.

Final paper (30%):

- At the end of the semester, you will turn in a proposal for a new study in the domain of social cognitive development. It must be 10 – 11 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 recommend that you keep a list of the open questions that you identify throughout the semester; when it comes time to begin work on the paper, this list will come in handy.
- 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.

- You should email me a short description (just a few sentences) about your study proposal by November 25 (the Tuesday before Thanksgiving). Based on these descriptions, I'll be able to let you know if you're headed down a reasonable path. I'm also happy to discuss your topic during my office hours. Note that if your presentation is in the first round, you'll want to email me well before the 25th.
- Final papers are due at **midnight** on the night of Wednesday, December 17th.

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

I will take a wait-and-see approach to the use of laptops and tablets during class. If you are clearly using them for note-taking or to view digital copies of the assigned reading, all will be fine. 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 for everyone (except when required for DSS accommodations).

Date	Topic
Sept 2	Intro and organization
Sept 4	A view on Cognitive Psychology; What infants see
Sept 9	Depth perception
Sept 11	Objects 1
Sept 16	Objects 2
Sept 18	Magnitude
Sept 23	Faces
Sept 25	Agents and Goals
Sept 30	Agents and Beliefs
Oct 2	How language works
Oct 7	Learning the sounds
Oct 9	Learning the structure
Oct 14	Words, categories, concepts
Oct 16	Essentialism 1 – Hidden insides
Oct 21	Essentialism 2 – Social groups
Oct 23	Memory
Oct 28	Probability and Statistics
Oct 30	Causal understanding
Nov 4	Action!
Nov 6	Symbols
Nov 11	Natural number
Nov 13	Natural geometry
Nov 18	Intelligence 1 – Gender?
Nov 20	Intelligence 2 – Schooling and SES
Nov 25	Paper presentations
Nov 27	*NO CLASS – THANKSGIVING*
Dec 2	Paper presentations
Dec 4	Paper presentations
Dec 9	Paper presentations
Dec 11	Wrap-up

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!

September 2: Introduction and organization

September 4: Cognitive Psychology in perspective

- Pinker, S. (1997). Standard equipment. In *How the mind works* (pp. 83-125). 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 9: 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).
- Gibson, E. J., & Walk, R. D. (1960). The "visual cliff". *Scientific American*, *202*(4), 64-71.
- 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 11: Objects 1

- 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 16: Objects 2

- Carey, S. (2009). Core object cognition. In *The origin of concepts* (pp. 67-116). Oxford University Press.
- Feigenson, L., & Carey, S. (2005). On the limits of infants' quantification of small object arrays. *Cognition*, *97*(3), 295-313.

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 23: Faces

- Johnson, M. H. (2005). Subcortical face processing. *Nat Rev Neurosci*, *6*(10), 766-74.
- Quinn, P. C., Yahr, J., Kuhn, A., Slater, A. M., & Pascalis, O. (2002). Representation of the gender of human faces by infants: A preference for female. *Perception*, *31*(9), 1109-1122.

September 25: Agents and goals

- 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 30: Agents and beliefs

- Flavell, J. H. (2004). Theory-of-mind development: Retrospect and prospect. *Merrill-Palmer Quarterly*, *50*(3), 274-290.
- Onishi, K. H., & Baillargeon, R. (2005). Do 15-month-old infants understand false beliefs? *Science*, *308*(5719), 255-8.
- Southgate, V., & Vernetti, A. (2014). Belief-based action prediction in preverbal infants. *Cognition*, *130*(1), 1-10.

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 7: Learning the 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. *Dev Psychobiol*, *56*(2), 154-78.

October 9: Learning the structure

- Saffran, J. R., Aslin, R. N., & Newport, E. L. (1996). Statistical learning by 8-month-old infants. *Science*, *274*(5294), 1926-1928.
- Marcus, G. F., Vijayan, S., Rao, S. B., & Vishton, P. M. (1999). Rule learning by seven-month-old infants. *Science*, *283*(5398), 77-80.
- Marslen-Wilson, W. D., & Tyler, L. K. (1997). Dissociating types of mental computation. *Nature*, *387*(6633), 592-593.

October 14: Words, categories, 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 16: Essentialism 1 – Hidden insides

- Gelman, S. A. (2003). Hidden, nonobvious properties. In *The essential child: Origins of essentialism in everyday thought* (pp. 60-88). Oxford University Press.
- Newman, G. E., Herrmann, P., Wynn, K., & Keil, F. C. (2008). Biases towards internal features in infants' reasoning about objects. *Cognition*, *107*(2), 420-32.

October 21: Essentialism 2 – Social groups

- Levy, S. R., & Dweck, C. S. (1999). The impact of children's static versus dynamic conceptions of people on stereotype formation. *Child Development*, *70*(5), 1163-1180.
- 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 23: 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).
- Principe, G. F., Kanaya, T., Ceci, S. J., & Singh, M. (2006). Believing is seeing how rumors can engender false memories in preschoolers. *Psychological Science*, *17*(3), 243-248.

October 28: Probability and statistics

- 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 understanding

- Carey, S. (2009). Representations of cause. In *The origins of concepts* (pp. 215-246)
- 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 4: Action!

- Adolph, K. E. (2000). Specificity of learning: Why infants fall over a veritable cliff. *Psychological Science*, *11*(4), 290-295.
- Keen, R. (2003). Representation of objects and events why do infants look so smart and toddlers look so dumb? *Current Directions in Psychological Science*, *12*(3), 79-83.

November 6: 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.

November 11: Natural number

- Carey, S. (2004). Bootstrapping & the origin of concepts. *Daedalus*, *133*(1), 59-68.
- Matsuzawa, T. (1985). Use of numbers by a chimpanzee. *Nature*, *315*(6014), 57-59.
- Gordon, P. (2004). Numerical cognition without words: Evidence from amazonia. *Science*, *306*(5695), 496-9.

November 13: Natural geometry

- Spelke, E., Lee, S. A., & Izard, V. (2010). Beyond core knowledge: Natural geometry. *Cognitive Science*, *34*(5), 863-884.
- Lee, S. A., & Spelke, E. S. (2011). Young children reorient by computing layout geometry, not by matching images of the environment. *Psychonomic Bulletin & Review*, *18*(1), 192-8.

- Dehaene, S., Izard, V., Pica, P., & Spelke, E. (2006). Core knowledge of geometry in an amazonian indigene group. *Science*, *311*(5759), 381-384.

November 18: Intelligence 1 – Gender?

- **WATCH:** Spelke versus Pinker debate on "The Science of Gender and Science"
  - http://edge.org/3rd_culture/debate05/debate05_index.html
- Ambady, N., Shih, M., Kim, A., & Pittinsky, T. L. (2001). Stereotype susceptibility in children: Effects of identity activation on quantitative performance. *Psychological Science*, *12*(5), 385-390.

November 20: Intelligence 2 – Schooling and SES

- Ceci, S. J. (1991). How much does schooling influence general intelligence and its cognitive components? A reassessment of the evidence. *Developmental Psychology*, *27*(5), 703.
- Turkheimer, E., Haley, A., Waldron, M., d'Onofrio, B., & Gottesman, I. I. (2003). Socioeconomic status modifies heritability of IQ in young children. *Psychological Science*, *14*(6), 623-628.

November 25: Paper presentations – Group 1

November 27: NO CLASS – *Thanksgiving!*

December 2: Paper presentations – Group 2

December 4: Paper presentations – Group 3

December 9: Paper presentations – Group 4

December 11: Wrap-up discussion

- Readings TBA

[Final papers due by midnight on Wednesday, December 17th]