EDHD 721
Cognitive Development & Learning
Fall 2016
Thursday 4:15 – 7:00 pm
Benjamin Building Room 3236

Instructor: Richard Prather
Office Hours: By appointment
Email: prather1@umd.edu

Textbook
None.
Readings will include research journal and magazine articles, which will be distributed on-line

GRADE SUMMARY
Class participation: 20%
Midterm take home essay: 30% Due 10.27.16
Presentation: 15%
Final paper: 35%

COURSE DESCRIPTION
The aim of this course is to present the major theories, issues, and areas of research in cognitive development. An emphasis will be made on the application of these concepts to education, how those have developed historically and how they fit into a greater societal framework. The course will begin with discussions of theoretical frameworks for studying cognitive development. The second part of the course will focus on specific areas of cognitive development, including reading, mathematics and language skills. In addition to learning content relevant to Cognitive Development, students will gain experience presenting, writing and evaluating research.

COURSE GOALS
By the end of this course, students should be able to

• Develop the ability to critically evaluate scientific research and interpret research findings.

• Understand theoretical perspectives in cognitive development, including their strengths and weaknesses.

• Recognize the importance of the interaction between children and their environment, and how children's thinking and learning change with age and experience.

• Appreciate that scientific research in cognitive development has implications for applied issues relating to education.

COURSE REQUIREMENTS
Class Participation: This is a seminar course. Therefore, the entire class is responsible for reading the assigned materials closely and thoughtfully before each weekly meeting. Everyone should come to class prepared to ask questions, raise issues, and contribute to the discussion. <u>The success of this course, in a large part, relies upon each student's class participation</u>. If you are unable to attend a class, please inform the instructor as soon as possible.

Course Structure and Readings: This is a graduate seminar with a mixture of lecture and discussion. Students are strongly encouraged to make comments, ask questions, and raise issues for discussion during the entire class period. The readings will be made available through the University's Blackboard website, https://elms.umd.edu or class email list. If you prefer to make Xerox copies of the readings, please let the instructor know and the readings will be placed in the EDHD mailroom. Also, please let the instructor know if you have trouble accessing any of the readings.

Discussion Questions and Assignments: To facilitate class discussion, each student should write two questions on the week's reading and topic and fill out the provided QUALMRI worksheet. The questions should be thought provoking and identify issues or concerns that could be covered in the class discussion. The questions could also attempt to integrate material from other readings from the class, topics from other courses, or from specific research interests.

Class Presentation: Each student will be assigned to lead part of discussion one week. Students will be prepared to discuss the central themes of the paper, critique the accompanying reading, and lead an active group discussion. Students can choose the format of the presentation, and may include supporting materials, such as handouts or PowerPoint slides.

Midterm Exam: Students will be given a take-home exam and will have one week to complete it. The exam will consist of 2-3 essay questions. Midterm exam questions will be distributed at the end of class October 6th and will be due at the beginning of class on October 13th.

Final Paper and Final Paper Presentation: As a final paper, students will write either a review of the literature in a specific area of cognitive development or a proposal of a research study. Each student is required to submit a 1-2 paragraph description of their paper, along with a list of at least three references by November 4th. Final papers are due December 8th. Students are also required give a presentation on the final paper. All presentations will be approximately 10-15 minutes long and will take place during the last class period.

Note: Readings may change or be added during the semester. Changes will be announced in class or by email.

CLASS SCHEDULE

Week 1 *Introduction & Theories of Cognitive Development*

Spelke, E. S. & Kinzler, K. D. (2007). Core knowledge. *Developmental Science*, 10, 89-96.

Spencer. J. P., Blumberg, M. S., McMurray, B., Robinson, S. R., Samuelson, L. K. & Tomblin, J. B. (2009). Short arms and talking eggs: Why we should no longer abide the Nativist-Empiricist debate. *Child Development Perspectives*, 3, 79-87.

Smith & Thelen. (2003) Development as a Dynamic System

Week 2 *Language and Reading I*

Saffran et al (1997) Incidental Language Learning. *Psychological Science*.

Yu & Smith (2011) What you learn is what you see: using eye movements to study infant cross-situational word learning.

(w)Kuhl, P. K. (2004). Early language acquisition: Cracking the speech code. *Nature Reviews Neuroscience*, 5,

Week 3 *Language & Reading II*

(W)Hoff, E. (2006). How social contexts support and shape language development. Developmental Review, 26, 55-88.

Senechal, M. & LeFevre, J. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, 73, 445-460.

Whitehurst and Lonigan (1998) Child Development and Emergent Literacy. *Child Development*, Vol. 69, No. 3 (Jun., 1998), pp. 848-872

Week 4 *Language & Reading III*

(W)Seidenberg. The Science of Reading and Its Educational Implications

Vellutino, F.R., Fletcher, J.M., Snowling, M.J., & Scanlon, D.M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? *Journal of Child Psychology and Psychiatry*, 45(1), 2-40.

Oliver, B.R., Dale, P. S., & Plomin, R. (2005). Predicting literacy at age 7 from preliteracy at age 4. *Psychological Science*, 16, 861-865.

Week 5 *Mathematics I: Infants*

Wynn 1992(1) Addition and Subtraction by human infants. *Nature*

Mix Hottenlocher Levine (2002)(2) Multiple Cues for Quantification in Infancy: Is Number one of them? *Psychological Bulletin.*

Xu Spelke (2000)(1) Large number discrimination in 6-month-old infants. *Cognition.*

Week 6 *Mathematics II*

Prather 2009 The development of arithmetic principle knowledge: How do we know what learners know?

Prather, R. W., & Alibali, M. W. (2008). Understanding and using principles of arithmetic: operations involving negative numbers. *Cognitive Science*, *32*(2), 445–457.

Prather & Alibali (2011) Children's Acquisition of Arithmetic Principles. *Cognition and Development.*

Week 7 *Mathematics III*

McNeil, N. M., & Alibali, M. W. (2004). You'll see what you mean: Students encode equations based on their knowledge of arithmetic. *Cognitive Science*, *28*, 451–466.

Siegler, R., Booth, J (2004) Development of Numerical Estimation in Young Children

Prather (2012) Connecting Neural Coding to Numerical Cognition

Week 8 *Mathematics IV: Neural Basis*

Dehaene & Nieder (2009) Representation of Number in the Brain. Annual Reviews of Neuroscience

Cohen Kadosh, Cohen Kadosh,, Henik (2008) When brightness counts: The Neural Correlate of Numerical-Luminance Interference. Cerebral Cortex.

*Ansari (2008) Effects of development and enculturation on number representation in the brain

Week 9 *Learning*
Midterm Due. (10.27.16)

Seger (1994) Implicit Learning. *Psychological Bulletin*

Week 10 *Cognitive Development & Society I*
Brain Training
http://www.brainhq.com
http://www.cogmed.com/
http://www.lumosity.com/

https://www.ftc.gov/news-events/press-releases/2016/01/lumosity-pay-2-million-settle-ftc-deceptive-advertising-charges

Ballesteros, S., Prieto, A., Mayas, J., Toril, P., Pita, C., Ponce de León, L., ... Waterworth, J. (2014). Brain training with non-action video games enhances aspects of cognition in older adults: a randomized controlled trial. Frontiers in Aging Neuroscience, 6(October), 277. http://doi.org/10.3389/fnagi.2014.00277

Snowball, A., Tachtsidis, I., Popescu, T., Thompson, J., Delazer, M., Zamarian, L., ... Kadosh, R. C. (2013). Report Long-Term Enhancement of Brain Function and Cognition Using Cognitive Training and Brain Stimulation. Current Biology, 1–6. http://doi.org/10.1016/j.cub.2013.04.045

Howard-Jones, P. a. (2014). Neuroscience and education: myths and messages. Nature Reviews. Neuroscience, (October). http://doi.org/10.1038/nrn3817

Combining brain stimulation and video game to promote long-term transfer of learning and cognitive enhancement

Week 11 *Cognitive Development & Society II NeuroEducation*

Ansari, D., & Coch, D. (2006). Bridges over troubled waters: education and cognitive neuroscience. Trends in Cognitive Sciences, 10(4), 146–51. http://doi.org/10.1016/j.tics.2006.02.007

Ansari et al 2011. Neuroeducation – A critical overview of an Emerging field

Week 12 *Cognitive Development & Society III*
Differences in Development:

Rowe, M. L. (2008). Child-directed speech: Relation to socioeconomic status, knowledge of child development, and child vocabulary skill. *Journal of Child Language, 35,* 185-205*.*

Noble, K.G., McCandliss, BD, & Farah, MJ (2007) Socioeconomic background predicts individual differences in neurocognitive abilities. *Developmental Science* 10, 464-480.

Starkey, P., Klein, A., & Wakeley, A. (2004). Enhancing young children ' s mathematical knowledge through a pre-kindergarten mathematics intervention, 19, 99–120. http://doi.org/10.1016/j.ecresq.2004.01.002

http://theconversation.com/your-vocabulary-aged-40-depends-on-how-much-you-read-as-a-teenager-33852

https://www.washingtonpost.com/news/wonk/wp/2016/01/15/the-brain-science-behind-britains-new-parenting-classes/

Week 13 *Special Cases: Atypical Development*

Whitehurst, G. J. & Lonigan, C. J. (1998) Child development and emergent literacy. *Child Development. Vol 69(3)* 848-872.

Dickinson, D. (2011). Teachers' language practices and academic outcomes of preschool children. *Science*, *333*, 964-967.

Evans, J. L., Saffran, J. R., & Robe-Torres, K. (2009). Statistical learning in children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, *52*(2), 321-335.

Meier, R. P. (1991). Language acquisition by deaf children. *American Scientist*, 79, 60-70.

Tager-Flussberg (2007). Atypical Language Development: Autism and other neurodevelopmental disorders. In E. Hoff & M. Shatz (Eds.) Blackwell handbook of language development (pp. 432-453). Oxford UK: Blackwell.

Windsor et al (2013). Effect of foster care on language learning at eight years: Findings from the Bucharest early intervention project. Journal of Child Language, 40 (3) 605-627.

Week 14 *Perceptual & Motor Development*

http://www.cde.ca.gov/sp/cd/re/itf09percmotdev.asp

(W)(Bahrick, Lickliter, and Flom 2004) Intersensory Redundancy Guides the Development of Selective Attention, Perception, and Cognition in Infancy

(M)Smith, L. B., Thelen, E., Titzer, R., & Mclin, D. (1999). Knowing in the Context of Acting : The Task Dynamics of the A-Not-B Error, 106(2), 235–260.

Week 15
Final Paper Review

BLACKBOARD
We will be using the University's Blackboard, https://elms.umd.edu. The syllabus, additional readings, and announcements will be posted on Blackboard. Students can login to the website using your University ID and Password. Please let the instructor know if you have trouble accessing the course website.

CLASS POLICIES
Academic integrity: The University of Maryland, College Park has a student-administered Honor Code and Honor Pledge. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/whatis.html. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. The code prohibits students from cheating, fabrication, facilitating academic dishonesty, and plagiarism. Instances of this include submitting someone else's work as your own, submitting your own work completed for another class without permission, or failing to properly cite information other than your own (found in journals, books, online, or otherwise). Any form of academic dishonesty will not be tolerated, and any sign of academic dishonesty will be reported to the appropriate University officials.

Special needs: If you have a registered disability that will require accommodation, please see the instructor so necessary arrangements can be made. If you have a disability and have not yet registered with the University, please contact Disability Support Services in the Shoemaker Building (301.314.7682, or 301.405.7683 TTD) as soon as possible.

Religious observances: The University of Maryland policy on religious observances states that students not be penalized in any way for participation in religious observances. Students shall be allowed, whenever possible, to make up academic assignments that are missed due to such absences. However, the must contact the instructor before the absence with a written notification of the projected absence, and arrangements will be made for make-up work or examinations.

Course evaluations: As a member of our academic community, students have a number of important responsibilities. One of these responsibilities is to submit

course evaluations each term though CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Missed single class due to illness: Once during a semester, a student's self-authored note will be accepted as an excuse for missing a minor scheduled grading event in a single class session if the note documents the date of the illness, acknowledgement from the student that information provided in the note is correct, and a statement that the student understands that providing false information is a violation of the Code of Student Conduct. Students are expected to attempt to inform the instructor of the illness prior to the date of the missed class.* Major scheduled grading events: Major Scheduled Grading Events (MSGE) are indicated on the syllabus in bold. The conditions for accepting a self-signed note do not apply to these events. Written, signed documentation by a health care professional, or other professional in the case of non-medical reasons (see below) of a University-approved excuse for the student's absence must be supplied. This documentation must include verification of treatment dates and the time period for which the student was unable to meet course requirements. Providers should not include diagnostic information. Without this documentation, opportunities to make up missed assignments or assessments will not be provided. Non-consecutive, medically necessitated absences from multiple class sessions: Students who throughout the semester miss multiple, non-consecutive class sessions due to medical problems must provide written documentation from a health care professional that their attendance on those days was prohibited for medical reasons. Non-medical excused absences: According to University policy, non-medical excused absences for missed assignments or assessments may include illness of a dependent, religious observance, involvement in University activities at the request of University officials, or circumstances that are beyond the control of the student. Students asking for excused absence for any of those reasons must also supply appropriate written documentation of the cause and make every attempt to inform the instructor prior to the date of the missed class.