

HDE 234: Children's Learning & Thinking Spring 2018

Class Time: 4:10-7:00 p.m., Wednesday

Classroom: Olson 144 (or 2338 Hart Hall)

Instructor: Zhe Chen, Ph.D.

Office: 1339 Hart Hall

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Office Hours: Wednesday 1:00 -3:00 PM or by appointment

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Course Goal & Description:

The goals of this course are for students to learn the major theories, research methods, and findings of children's higher-order cognition, including origins of knowledge, memory, problem-solving skills, reasoning strategies, and scientific concepts, with an emphasis on the underlying mechanisms involved in children's thinking and learning processes. The focus of the course will be on how children think and learn and how children's abilities and strategies change with age and experience.

Class Format:

The class format will consist of outside readings, in-class lectures, student presentations, and group discussions. For each class, students will read 4 or 5 journal articles or chapters. For those who need the background, it is recommended that you read the corresponding chapters of Robert Siegler and Martha Alibali's *Children's Thinking* (fourth edition), or David Bjorklund's *Children's Thinking* (fifth edition) and the additional journal articles/chapters listed below. These recommended readings are not required, but they might be helpful if you are assigned to present on that day and/or choose to do your reaction paper on that topic. At the beginning of each class session, the instructor will provide a brief overview of the major issues associated with the topic of that day. Two students will then be responsible for leading the discussion. Each student discussion leader will present a hand-out of 4 to 5 questions based on the 2 or 3 journal articles/chapters assigned. The questions will organize the discussion around the theoretical and methodological issues that the student leader sees as most important.

Reading:

The course will include a number of readings from diverse sources:

The majority of readings are original journal articles from major journals in the field (e.g., *Child Development* and *Developmental Psychology*).

Some important book chapters (e.g., some important articles in the recently published *Handbook of Child Psychology: Vol. 2: Cognition, Perception & Language*) are also included.

Other types of readings include special articles from *Current Directions in Psychological Science*, *Child Development Perspectives*, and *Child Development: Special Issue: New Directions for Child Development in the 21st Century*.

Topical Outline

1. Theories & approaches
2. Infant cognition I: Memory, imitation, representation & categorization
3. Infant cognition II: Number concepts, physical reasoning & problem solving
4. Memory development
5. Executive functioning & symbolic understanding
6. Concepts, mental models, rules & theory of mind
7. Problem solving & analogical transfer
8. Mathematical & scientific reasoning & learning
9. Summary, questions & future directions

Course Requirements:

- A. Readings. Read all assigned readings before the class in which they are to be discussed.
- B. Class participation. I encourage students to participate actively in class discussion. Students are expected to read all the assigned readings prior to class and to be prepared to discuss all of them intelligently.
- C. Class presentations. Generate discussion questions before class; summarize and discuss assigned articles in class.
- D. Reaction paper. A reaction paper is an informal, 3-4 page, personal evaluation of or reaction to an assigned article or set of papers. You will need to complete 1 of the 3 assigned reaction papers. At least one week prior to a paper's due date, I will distribute the topic as well as "directing questions" to constrain the domain of your responses. An asterisk (*) in the reading list indicates that a reaction paper on that topic is due that day.
- E. Research proposal. In a 10-page research proposal, you will address a specific issue in a particular domain of cognitive development. Your task is to identify a key issue in a specific area of cognitive development, explain why the issue is important, propose one or two experiments that would allow you to address the issue, illustrate how your study would allow you to address it, make predictions about possible results, and draw conclusions based on your anticipated results. About 3 or 4 weeks before the end of the quarter, a topical guideline from which you may select a subject for your proposal will be distributed.

Evaluation & Grading:

Each student's participation in class discussion will count for 10% of the final grade. Student presentations of journal articles and their overall performance as discussion leaders will count for a further 35%. The reaction paper will count for 15% of the final grade; the research proposal, the remaining 40%.

Determining course grade:

Class participation:	10%
Class presentations & discussions:	35%
Reaction paper:	15%
Research proposal:	40%

Grading system:

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = below 60

SYLLABUS

1. April 3: Introduction

2. April 10: Theories & Approaches

Piaget, J. (1964). Development and learning. In R. E. Ripple & V. N. Rockcastle (Eds.), *Piaget rediscovered* (pp. 7-20).

Siegler, R., & Ellis, S. (1996). Piaget on childhood. *Psychological Science*, 7, 211-215.

Flavell (1992). Cognitive development: Past, present and future. *Developmental Psychology*, 28, 998-1005.

Gauvain, M. (1998). Cognitive development in social and cultural context. *Current Directions in Psychological Sciences*, 7, 188-192.

Siegler, R. (2000). The rebirth of children's learning. *Child Development*, 71, 26-35.

[Siegler, R. S. \(2016\)](#). Continuity and change in the field of cognitive development and in the perspectives of one cognitive developmentalist. *Child Development Perspectives*, 10(2), 128-133.

Recommended Readings:

Miller, P. H., & Coyle, T. R. (1999). Developmental change: Lessons from Microgenesis. In E. Scholnick., K. Nelson, S. Gelman., & P. Miller, (Eds.), *Conceptual development: Piaget's legacy*. Mahwah, Lawrence.

Johnson, M. (2000). Functional brain development in infants: Elements of an interactive specialization framework. *Child Development*, 71, 75-81.

Chen, Z., & Siegler, R. S. (2000). Across the great divide: Bridging the gap between understanding of toddlers' and older children's thinking. *Monographs of the Society for Research in Child Development*, 65 (2, Serial No. 261).

3. April 17: Infant cognition I: Memory, Imitation, Representation, & Categorization

Rovee-Collier, C. (1995). Time windows in cognitive development. *Developmental Psychology*, 31, 147-169.

Bauer, P. J., & Mandler, J. M. (1989). Putting the horse before the cart: The use of temporal order in recall of events by one-year-old children. *Developmental Psychology*, 28, 441-452.

Quinn, P., & Eimas, P. (1998). Evidence for a global categorical representation of humans by young infants. *Journal of Experimental Child Psychology*, 69, 151-174.

Aslin, R.N. (2011). Infant eyes: A window on cognitive development. *Infancy*, 126-140.

Recommended Readings:

Baillargeon, R. (1987). Object permanence in 3 1/2- and 4 1/2-month-old infants. *Developmental Psychology*, 23, 655-664.

Meltzoff, A. N. (1988). Infant imitation and memory: Nine-month-old infants in immediate and deferred tests. *Child Development*, 59, 217-225.

4. April 24: Infant Cognition II: Number Concepts, Physical Reasoning, & Problem Solving *

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

Baillargeon, R. (2004). Infants' physical world. *Current Directions in Psychological Science*, 13, 89-94.

Cordes, S. & Elizabeth M. Brannon, E. (2008). Quantitative competencies in infancy, *Developmental Science*, (p 803-808)

McCrink, K., & Wynn, K. (2004). Large-number addition and subtraction by 9-month-old infants. *Psychological Science*, 15, 776-781.

Clearfield, M. W., & Mix, K. S. (1999). Number versus contour length in infants' discrimination of small visual sets. *Psychological Science*, 10, 408-503.

Xu, F., Spelke, E. S., & Goddard, S. (2005). Number sense in human infants. *Developmental Science*, 8(1), 88-101.

Recommended Readings:

Haith, M., & Benson, J. (1998). Infant cognition. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.

Spelke., E., Breinlinger, K., Macomber, J., & Jacobson, K. (1992). Origins of knowledge. *Psychological Review*, 99, 605-632.

5. May 2: Memory Development

Coyle, T., & Bjorklund, D. (1997). Age differences in, and consequences of, multiple- and variable-strategy use on a multitrial sort-recall task. *Developmental Psychology*, 33, 372-380.

Baker-Ward, L., Gordon, B., Ornstein, P., Larus, D., & Clubb, P. (1993). Young children's long-term retention of a pediatric examination. *Child Development*, 64.

Melinder, A., Alexander, K., Cho, Y., Goodman, G. S., Thoresen, C., Lonnum, K., & Magnussen, S. (2010). Children's eyewitness memory: A comparison of two interviewing strategies as realized by forensic professionals. *Journal of Experimental Child Psychology*, 105, 156-177.

Goodman, G. S., & Quas, J. A. (2008). It's when and how, not just how many: Repeated interviews and children's memory. *Current Directions in Psychology*, 17, 386-390.

Recommended Readings:

Bjorklund, D., Bjorklund, B., Brown, D., & Cassel, W. (1998). Children's susceptibility to repeated questions: How misinformation changes children's answers and their minds. *Applied Developmental Science*, 2, 99-111.

Bjorklund, D., Miller, P. H., Coyle, T., & Slawinski, J. L. (1997). Instructing children to use memory strategies: Evidence of utilization deficiencies in memory training studies. *Developmental Review*, 17, 411-441.

6. May 9: Executive functioning & Symbolic Understanding *

Benson, J., Sabbagh, M. A., Carlson, S. M., & Zelazo, P. D. (2013). Individual differences in executive functioning predict preschoolers' improvement from theory-of-mind training. *Developmental Psychology*, 49, 1615-1627.

Sabbagh MA¹, Xu F, Carlson SM, Moses LJ, Lee K. (2006). The development of executive functioning and theory of mind. A comparison of Chinese and U.S. preschoolers. *Psychological Science*, 17, 74-81.

Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science*, 21, 335-341.

DeLoache, J. (1991). Symbolic functioning in very young children: Understanding of pictures and models. *Child Development*, 62, 736-752.

Kuhlmeier, V.A., & Boysen, S.T. (2002). Chimpanzees' recognition of the spatial and object similarities between a scale model and its referent. *Psychological Science*, 13, 60-63.

Marzolf, D. P., & DeLoache, J. S. (1994). Transfer in young children's understanding of spatial representations. *Child Development*, 65, 1-15.

Recommended Readings:

DeLoache, J. (1995). Early symbolic understanding and use. *The Psychology of Learning and Motivation*. New York: Academic Press.

DeLoache, J., Miller, K., & Pierroutsakos, S. (1998). Reasoning and problem solving. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.

7. May 16: Concepts, Mental Models, Rules, & Theory of Mind

Siegler, R. S. (1976). Three aspects of cognitive development. *Cognitive Psychology*, 8, 481-520.

Vosniadou, S., & Brewer, W. (1992). Mental models of the earth: A study of conceptual change in childhood. *Cognitive Psychology*, 24, 535-585.

Brandone, A. C., & Gelman, S. A. (2009). Differences in preschoolers' and adults' use of generics about novel animals and artifacts: A window onto a conceptual divide. *Cognition*, 110, 1-22.

Amsterlaw, J. & Wellman, H.W. (2009). Theories of Mind in Transition: A Microgenetic Study of the Development of False Belief Understanding (2009). *Journal of Cognition and Development*

Repacholi, B., & Gopnik, A. (1997). Early reasoning about desires: Evidence from 14- and 18-month-olds. *Developmental Psychology*, 33, 12-21.

Onishi, K. H., & Baillargeon, R. (2005). Do 15-month-old infants understand false beliefs? *Science*, 8 April, 255-258.

Recommended Readings:

Wellman, H., & Gelman, S. (1998). Knowledge acquisition in foundational domains. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.

Gopnik, A., & Astington, J. (1988). Children's understanding of representational change and its relation to the understanding of false belief and the appearance-reality distinction. *Child Development*, 59, 26-37.

8. May 23: Planning, Strategy, Problem Solving, & Analogical Transfer *

Brown, A. L., Kane, M. J., & Echols, C. H. (1986). Young children's mental models determine analogical transfer across problems with a common goal structure. *Cognitive Development*, 1, 103-121.

Goswami, U., & Brown, A. (1989). Melting chocolate and melting snowmen: Analogical reasoning and causal relations. *Cognition*, 35, 69-95.

Rattermann, M., & Gentner, D. (1998). More evidence for a relational shift in the development of analogy: Children's performance on a causal-mapping task. *Cognitive Development*, 13, 453-478.

Richland, L.E., Morrison, R.G., & Holyoak, K.J. (2006). Children's Development of Analogical Reasoning: Insights from Scene Analogy Problems. *Journal of Experimental Child Psychology*, 94, 249-273.

Recommended Readings:

DeLoache, J., Miller, K., & Pierroutsakos, S. (1998). Reasoning and problem solving. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.

Ellis, S., & Siegler, R. S. (1997). Planning and strategy choice, or why don't children plan when they should? In S. L. Friedman & E. K. Scholnick (Eds.), *Why, how, and when do we plan: The developmental psychology of planning*. Hillsdale, NJ: Erlbaum.

9. May 30: Mathematical & Scientific reasoning & learning

Siegler, R. S., Duncan, G. J., Davis-Kean, P. E., Duckworth, K., Claessens, A., Engel, M., Susperreguy, M. I., & Chen, M. (in press). Early predictors of high school mathematics achievement. *Psychological Science*.

Geary, D. C. (2011). Cognitive predictors of individual differences in achievement growth in mathematics: A five year longitudinal study. *Developmental Psychology*, 47, 1539-1552.

Sodian, Zaitchik, & Carey, S. (1991). Young children's differentiation of hypothetical beliefs from evidence. *Child Development*, 62, 753-766.

Chen, Z. & Klahr, D. (2008). Remote Transfer of Scientific Reasoning and Problem-Solving Strategies in Children. In R. V. Kail (Ed.) *Advances in Child Development and Behavior*, Vol. 36. (pp. 419 – 470) Amsterdam: Elsevier.

Recommended Readings:

Geary, D.C., Development of mathematical understanding, in *Handbook of child psychology: Volume 2: Cognition, perception, and language*, W. Damon, et al., Editors. 2006, Wiley: Hoboken, NH. p. 777-810.

Kuhn, D., Garcia-Mila, M., Zohar, A., & Andersen, C. (1995). Strategies of knowledge acquisition. *Monographs of the Society for Research in Child Development*. 50, (4, Serial No. #245).

Schauble, L. (1990). Belief revision in children: The role of prior knowledge and strategies for generating evidence. *Journal of Experimental Child Psychology*, 49, 31-57.

10. June 6: Summary, Questions, & Future Directions:

Siegler, R. (2005). Children's learning. *American Psychologist*, 60, 769-778.

Kuhn, D. & Siegler, R. (2006). *Preface to Volume Two, Cognition, perception & language*. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.

Recommended Readings:

Goldin-Meadow, S. (2000). Beyond words: The importance of gesture to researchers and learners. *Child Development*, 71, 231-239.

Samuelson, L., & Smith, L. (2000). Grounding development in cognitive processes. *Child Development, 71*, 98-106.

Schwebel, D., Plumert, J., & Pick, H. (2000). Integrating basic and applied developmental research: A new model for the twenty-first century. *Child Development, 71*, 222-238.

Siegler, R. (1998). Foreword. In W. Damon (Series Ed.) & D. Kuhn & R. S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2: Cognition, perception & language*, New York: Wiley.