

## **Preliminary Syllabus**

### **Course Title: G4270 - Cognitive Processes: METACOGNITION**

Fall 2010

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Meeting Time: Tuesdays 2:10-4

### **Course description:**

Metacognition is one of the latest psychological buzz words, but what exactly is metacognition? Metacognition enables us to be successful learners, problem solvers, and decision makers, and has often been used synonymously with words such as language, awareness, and consciousness. In this seminar, we will examine various components of metacognition, including its role in learning and memory, and its existence in various non-human populations. In addition, we will explore the fragility of metacognition, including illusions of confidence and harmful control strategies that people use. Readings will include classic and important recent papers in the field, looking at metacognition as a higher-level cognitive process, and as knowledge individuals use to guide behavior.

### **Assignments:**

Reading assignments will be the basis for the in-class discussion each class period. Thus, it is crucial that they be read carefully *before* each class meeting. For each week, students will be assigned as "discussion leaders" for the discussions, and will be responsible to briefly summarize the hypotheses, methods, and results for that week's readings. Participation in class will count as 20% of your final course grade. There will also be 2 take-home paper assignments, one due mid-semester (worth 30%), and one due at the end of the semester (worth 50%).

### **What you will take away from this course:**

1. An improved awareness for how to read and analyze scientific articles on a specific topic -- in this case, how to think about one's own thinking.
2. An understanding of metacognitive theories and mechanisms, and an improved understanding of scientific theory more generally, which includes facility in evaluating and debating about metacognitive theories.
3. Appreciation for the many components of metacognition, and an ability to bring knowledge from separate research themes to provide a big picture appreciation for why metacognition exists.
4. An improved awareness of one's own mental processes and how that awareness can lead to becoming a more effective learner and decision-maker.

### **Required Readings:**

There will be one required textbook for this seminar: "*Metacognition*" by John Dunlosky and Janet Metcalfe, published in 2009. The book will be available at The Book Culture, located on

112th St. between Broadway and Amsterdam. Each week, specific pages from this textbook will be assigned in addition to the various scientific articles listed below under each theme.

These reading assignments are subject to revision.

**Theme 1: Definitions - What is Metacognition?**

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911.

Brown, A. L. (1987). Metacognition, executive control, self-regulation and other more mysterious mechanism. In F. E. Weinert, & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 65-116): Hillsdale, NJ: Lawrence Erlbaum Associates.

**Theme 2: Foundations - What is Metacognition good for?**

Schoenfeld, A. H. (1987). What's all the fuss about metacognition? In Schoenfeld, A. H. (Ed), *Cognitive Science and Mathematics Education*, pages 189-215.

Nelson, T. O., & Narens, L. (1994). Why investigate metacognition? In J. Metcalfe, & A. J. Shimamura (Eds.). (1994). *Metacognition: Knowing About Knowing*. (pp. 1-26). Cambridge, MA: MIT Press.

**Theme 3: Introspection - Can verbal reports be used as data?**

Nisbett, R. & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review*, 87, 215-251.

Nelson, T. O. (1996). Consciousness and metacognition. *American Psychologist*, 51, 102-116.

**Theme 4: Measurement - How are verbal reports analyzed?**

Keren, G. (1991). Calibration and probability judgments: Conceptual and methodological issues. *Acta Psychologica*, 77, 217-273.

Nelson, T. O. (1984). A comparison of current measures of the accuracy of feeling-of-knowing predictions. *Psychological Bulletin*, 95, 109-133.

Benjamin, A. S., & Diaz, M. (2008). Measurement of relative metamnemonic accuracy. In J. Dunlosky & R. A. Bjork (Eds.) *Handbook of Metamemory and Memory*. (73-84). NY: Psychology Press.

**Theme 5: Mechanisms - How does Metacognition work?**

Dunlosky, J., & Nelson, T. O. (1992). Importance of the kind of cue for judgments of learning (JOL) and the delayed-JOL effect. *Memory & Cognition*, 20, 373-380.

Reder, L. M., & Ritter, F. E. (1992). What determines initial feeling of knowing? Familiarity with question terms, not with the answer. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 18, 435-451.

Son, L. K., & Metcalfe, J. (2005). Judgments of Learning: Evidence for a Two-Stage Model. *Memory & Cognition*, 33, 1116-1129.

**Theme 6: Monitoring - Can Metacognitive Knowledge Break down?**

- Son, L. K., & Sethi, R. (2006). Metacognitive control and optimal learning. *Cognitive Science*, 30, 759-774.
- Koriat, A., & Levy-Sadot, R. (2001). The combined contributions of the cue-familiarity and accessibility heuristics to feelings of knowing. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 27, 34-53.
- Rhodes, M. G. & Castel, A. D. (2008). Memory predictions are influenced by perceptual information: evidence for metacognitive illusions. *Journal of Experimental Psychology: General*, 137, 615-625.

**Theme 7: Control - What are the consequences of metacognitive break down?**

- Metcalf, J. & Finn, B. (2008). Evidence that judgments of learning are causally related to study choice. *Psychonomic Bulletin & Review*, 15, 174-179.
- Son, L. K. (2004). Spacing one's study: Evidence for a metacognitive control strategy. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30, 601-604.
- Son, L. K. & Kornell, N. (2008). Research on the allocation of study time: Key studies from 1890 to the present (and beyond). In J. Dunlosky & R. A. Bjork (Eds.), *A handbook of memory and metamemory* (pp. 333-351). Hillsdale, NJ: Psychology Press.

**Theme 8: Implicit Metacognition - Metacognition's relation to Non-verbal species**

- Son, L. K., & Kornell, N. (2005). Meta-confidence judgments in rhesus macaques: Explicit versus implicit mechanisms. In Terrace, H.S. & Metcalfe, J. (Eds.), *The Missing Link in Cognition: Origins of Self-Knowing Consciousness*. Oxford University Press.
- Washburn, D. A., Smith, J. D., & Shields, W. E. (2006). Rhesus monkeys (*Macaca mulatta*) immediately generalize the *uncertain* response. *Journal of Experimental Psychology: Animal Behavior Processes*, 32, 185-189.
- Kornell, N., Son, L. K., & Terrace, H. (2007). Transfer of Metacognitive Skills and Hint Seeking in Monkeys. *Psychological Science*, 18, 64-71.

**Theme 9: Development - Who has it?**

- Lockl, L., & Schnieder, W. (2007). Knowledge about the mind: Links between theory of mind and later metamemory. *Child Development*, 78, 148-167.
- Son, L. K. (2005). Metacognitive control: Children's short-term versus long-term study strategies. *Journal of General Psychology*, 132, 347-363.
- Kuhn, D. (2000). Metacognitive development. *Current directions in psychological science*, 9(5), 178-181.

**Theme 10: Applications - Does good metacognition help performance?**

- Kornell, N., & Son, L. K. (2009). Learners' choices and beliefs about self-testing. *Memory*, 17, 493-501.
- Metcalf, J., Kornell, N., & Son, L. K. (2007). A cognitive-science based program to enhance study efficacy in a high and low-risk setting. *European Journal of Cognitive Psychology*, 19, 743-768.
- Paris, S. (2002). When is metacognition helpful, debilitating, or benign? In P. Chambres, M. Izaute & P.-J. Marescaux (Eds.), *Metacognition: Process, function and use* (pp. 105-120). Boston: Kluwer.

Theme 11: Self-awareness - What does it mean to have privileged access?

Metcalfe, J., & Greene, M.J. (2007). Metacognition of agency. *Journal of Experimental Psychology: General*, *136*, 184-199.

Son, L. K. (2010). Metacognitive control and the spacing effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.

Miele, D. B., Molden, D. C., & Gardner, W. L. (2009). Motivated comprehension regulation: Vigilant versus eager metacognitive control. *Memory & Cognition*, *37*, 779-795.