EDP 382D: COMPLEX COGNITIVE PROCESSES IN EDUCATION
Fall 2015, Unique #10825
Wednesdays, 4:00–7:00PM, SZB 444
The University of Texas at Austin

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Course Objectives

The purpose of this course is to give you a foundation in research and theories pertaining to higher order learning. We have several courses in the department that focus in varying degrees on this general topic (e.g., Psychology of Learning, Psycholinguistics, Instructional Psychology, Motivation & Emotion, etc.); thus, I have tried to differentiate this course by largely focusing on cognitive psychology, both classic and cutting-edge. My hope is that you will develop an appreciation for the challenges and progress in this area of research, identify limitations to current work, and discuss possible directions for further research. Indeed, the main product of the course is a research proposal in which you will have the opportunity to identify a question that interests you, situate it within existing theory/research, and articulate how you would study it.

In addition to acquiring some content knowledge, a further goal is to provide you with opportunities to practice skills that will be valuable regardless of your career path:

1) Evaluating research and theories
2) Providing constructive criticism
3) Communicating ideas both orally and in writing
4) Facilitating discussion

As described below, you will have numerous formal and informal opportunities for practice. My hope is that this practice, along with feedback from your classmates and myself, will help you to further develop these skills.

Finally, I want the work that you produce for this course to be useful to you outside of the course. Thus, the main piece of work that you produce will be a research proposal that combines your interests with a topic from the course. Hopefully, the proposed research will be something that you could pursue at some point — either in the near future or later on in your career.

Website and Communication

This course has a Canvas site associated with it (http://canvas.utexas.edu/). Canvas will be used to post announcements, course documents, assignments, supplementary materials, and lecture slides. Please check the site regularly for announcements, assignment reminders, and other messages.

The best way to reach me outside of class is via email. I try to respond to email as promptly as possible; if 24 hours have passed without a response, please feel free to re-send the message. Although I will not have set office hours, I would be happy to meet with you individually, so please let me know if you would like to talk. In particular, I encourage you to talk with me about both your research proposal and your plan for facilitating discussion.

Course Overview

The majority of the course will be structured around discussing articles from the literature. You will be responsible for reading the assigned articles and thinking critically about them prior to class. All readings will be posted to our Canvas site, and they will be divided into core and supplemental articles. Each week, everyone in the class will read the core articles, which will generally consist of reviews and meta-analyses. In addition, you will select one of the supplemental articles to read (but feel free to read more); the supplemental articles will generally be reports of empirical research. To encourage thoughtful reading, I will require you to prepare two questions before class, one question about one or more of core articles and one question about the supplemental article that you chose.

Each class will be divided into three phases. First, we will have a face-to-face discussion of the core articles in a large group. Each week, two students will be assigned to co-lead of the face to-face discussion. Second, we will have three simultaneous online discussions of the supplemental articles using Canvas. One student will facilitate the discussion of each supplemental article; the other students will participate in the discussion of whichever supplemental article they chose to read. At the end of the online discussions, we will come back together as a large group and share some of the take-away points that came out of each discussion. Third, I will prepare you for the readings for the following week by providing background on the next topic.

In addition to the assigned readings and class sessions, each student will independently develop a research proposal over the course of the semester; it is expected that this process will involve additional reading that is directly relevant to the proposal. Students will receive feedback on a full draft of their proposal from two of their classmates through a peer-review assignment. I will also provide feedback on the draft.

Evaluation

The basis of evaluation is how much you learn and not how well you do in comparison to others in the class. Here are the key components:

Weekly Questions (10%)

In order to facilitate discussion, you will be required to post two questions to Canvas by noon each Tuesday before class. One of the questions should focus on the core articles, while the other question should be about one of the supplemental articles. Everyone will be able to view all the questions (as well as who posted each question), so please review the questions generated by other students before you come to class.

Discussion Facilitation (15%)

You will be responsible for facilitating discussion twice during the course. Each student will co-lead one large group, face-to-face discussion of the core articles and lead one small group, online discussion of a supplemental article. Discussion leaders are encouraged to discuss their plans with me well in advance of the class, but at least two days before. You have a lot of freedom in how to structure and guide the discussion, so feel free to be creative. I also will help to facilitate discussion as needed.

Research Proposal (65%)

You will develop a research proposal that combines your interests with a topic from the course. The proposed research project can be quantitative or qualitative in nature, but must consist of an empirical study designed to answer a specific question of interest related to complex cognitive processes. You will have numerous deadlines to help you stay on track (see Schedule below). The formal selection of a topic and the submission of an outline are required, but they will not be graded. You will hand in two drafts of the full research proposal. Formal feedback will be provided on the first draft (see next section on Peer Review) and a tentative grade will be assigned. After revising the proposal to incorporate the feedback, you will submit a final draft and a final grade will be assigned that takes into account the degree of improvement. The proposal should include an introduction, a method section, and a discussion of potential results. The proposal should be 10-15 double-spaced pages in length and written in APA style (see Resources for Writing folder in the files on Canvas).

Peer Review (10%)

You will be asked to write a formal review for two of your classmates' research proposals. Each review should be no longer than two double-spaced pages and provide constructive criticism to help improve the proposal. Reviews will be graded on a five-point scale.

Schedule

Date	Topic	Assignments*
8/26	Introductions, Planning & Course Overview	
9/2	Evaluating Research & Theories; Higher Order Learning	
9/9	Memory: Encoding Processes	
9/16	Memory: Retrieval Processes	Select Topic for Research Proposal
9/23	Transfer: Factors & Dimensions	
9/30	Transfer: Analogical Reasoning	Outline of Research Proposal
10/7	Knowledge: Acquisition, Structure, & Retention	
10/14	Knowledge: Error-Correction & Conceptual Change	
10/21	Metacognition: Monitoring	
10/28	Metacognition: Control	
11/4	Text & Discourse Processing	First Draft of Research Proposal
11/11	Problem-Solving & Creativity	
11/18	TBD	Peer Review of Proposals
11/25	*No Class (Thanksgiving)*	
12/2	TBD	Final Draft of Research Proposal

** See Readings section for information on assigned articles*

Readings

(Core readings are italicized; supplemental readings are normal font)

9/2 – Evaluating Research and Theories; Higher Order Learning

Roediger, H. L., & McCabe, D. P. (2007). Evaluating experimental research. In R. J. Sternberg, H. L. Roediger, & D. F. Halpern (Eds.), Critical thinking in psychology. Cambridge University Press.

Dennis, S., & Kintsch, W. (2007). Evaluating theories. In R. J. Sternberg, H. L. Roediger, & D. F. Halpern (Eds.), Critical thinking in psychology. Cambridge University Press.

Anderson, L. W., Krathwohl, D. R., Airiasian, W., Cruikshank, K. A., Mayer, R. E., & Pintrich, P. R. (2001). A taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy of educational outcomes. New York: Longman.

Bloom, B. S. (1956). Taxonomy of educational objectives: The classification of education goals: Cognitive domain. New York: David McKay.

9/9 – Memory: Encoding Processes

Bower, G. H. (2000). A brief history of memory research. In E. Tulving & F. I. M. Craik (Eds.), The Oxford handbook of memory (pp. 3-32). Oxford University Press.

Roediger, H. L., Gallo, D. A., & Geraci, L. (2002). Processing approaches to cognition: The impetus from the levels-of-processing framework. Memory, 10, 319-332.

Craik, F. I., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. Journal of Experimental Psychology: General, 104, 268.

Einstein, G. O., McDaniel, M. A., Owen, P. D., & Cote, N. C. (1990). Encoding and recall of texts: The importance of material appropriate processing. Journal of Memory and Language, 29, 566-581.

Bransford, J. D., & Johnson, M. K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. Journal of Verbal Learning and Verbal Behavior, 11, 717-726.

9/16 – Memory: Retrieval Processes

Roediger, H. L., & Guynn, M. J. (1996). Retrieval processes. In R. A. Bjork & E. L. Bjork, Memory (pp. 197-236). New York: Academic Press.

Roediger, H. L., & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. Trends in Cognitive Sciences, 15(1), 20-27.

Mäntylä, T. (1986). Optimizing cue effectiveness: Recall of 500 and 600 incidentally learned words. Journal of Experimental Psychology: Learning, Memory, and Cognition, 12, 66-71.

Chan, J. C. K. (2009). When does retrieval induce forgetting and when does it induce facilitation? Implications for retrieval inhibition, testing effect, and text processing. Journal of Memory and Language, 61, 153-170.

Morris, C. D., Bransford, J. D., & Franks, J. J. (1977). Levels of processing versus transfer appropriate processing. Journal of Verbal Learning and Verbal Behavior, 16, 519-533.

9/23 – Transfer: Factors & Dimensions

Barnett, S. M., & Ceci, S. J. (2002). When and where do we apply what we learn?: A taxonomy for far transfer. Psychological Bulletin, 128, 612-637.

Bransford, J. D., & Schwartz, D. L. (1999). Rethinking transfer: A simple proposal with multiple implications. Review of Research in Education, 61-100.

Thorndike, E. L., & Woodworth, R. S. (1901). The influence of improvement in one mental function upon the efficiency of other functions. I. Psychological Review, 8, 247-261.

Lehman, D. R., Lempert, R. O., & Nisbett, R. E. (1988). The effects of graduate training on reasoning: Formal discipline and thinking about everyday-life events. American Psychologist, 43, 431-442.

Butler, A. C., Godbole, N., & Marsh, E. J. (2013). Explanation feedback is better than correct answer feedback for promoting transfer of learning. Journal of Educational Psychology, 105, 290-298.

9/30 – Transfer: Analogical Reasoning

Gentner, D., & Smith, L. A. (2013). Analogical learning and reasoning. In D. Reisberg (Ed.), The Oxford handbook of cognitive psychology (pp. 668-681). Oxford University Press.

Reeves, L. M., & Weisberg, R. W. (1994). The role of content and abstract information in analogical transfer. Psychological Bulletin, 115, 381-400.

Needham, D. R., & Begg, I. M. (1991). Problem-oriented training promotes spontaneous analogical transfer: Memory-oriented training promotes memory for training. Memory & Cognition, 19, 543-557.

Holyoak, K. J., & Koh, K. (1987). Surface and structural similarity in analogical transfer. Memory & Cognition, 15, 332-340.

Brown, A. L., Kane, M. J., & Long, C. (1989). Analogical transfer in young children: Analogies as tools for communication and exposition. Applied Cognitive Psychology, 3, 275-293.

10/7 – Knowledge: Acquisition, Structure, & Retention

Chi, M. T., & Ohlsson, S. (2005). Complex declarative learning. In K. J. Holyoak & R. G. Morrison (Eds.), The Cambridge handbook of thinking and reasoning (pp. 371-399). Cambridge University Press.

Bahrick, H. P. (2000). Long-term maintenance of knowledge. In E. Tulving & F. I. M. Craik (Eds.), The Oxford handbook of memory (pp. 347-362). Oxford University Press.

Marsh, E. J., Meade, M. L., & Roediger III, H. L. (2003). Learning facts from fiction. Journal of Memory and Language, 49, 519-536.

Stanovich, K. E., & Cunningham, A. E. (1993). Where does knowledge come from? Specific associations between print exposure and information acquisition. Journal of Educational Psychology, 85, 211-229.

Custers, E. J., & ten Cate, O. T. (2011). Very long-term retention of basic science knowledge in doctors after graduation. Medical Education, 45, 422-430.

10/14 – Knowledge: Error-Correction & Conceptual Change

Chi, M. T. (2008). Three types of conceptual change: Belief revision, mental model transformation, and categorical shift. In S. Vosniadou (Ed.), International handbook of research on conceptual change (pp. 61-82). Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77, 81-112.

Gilbert, D. T. (1991). How mental systems believe. American Psychologist, 46, 107-119.

Butterfield, B., & Metcalfe, J. (2001). Errors committed with high confidence are hypercorrected. Journal of Experimental Psychology: Learning, Memory, and Cognition, 27, 1491-1494.

Mullet, H. G., Butler, A. C., Verdin, B., von Borries, R., & Marsh, E. J. (2014). Delaying feedback promotes transfer of knowledge despite student preferences to receive feedback immediately. Journal of Applied Research in Memory and Cognition, 3, 222-229.

10/21 – Metacognition: Monitoring

Bjork, R. A., Dunlosky, J., & Kornell, N. (2013). Self-regulated learning: Beliefs, techniques, and illusions. Annual Review of Psychology, 64, 417-444.

Koriat, A. (1997). Monitoring one's own knowledge during study: A cue-utilization approach to judgments of learning. Journal of Experimental Psychology: General, 126, 349-370.

Brown, A. S., & Murphy, D. R. (1989). Cryptomnesia: Delineating inadvertent plagiarism. Journal of Experimental Psychology: Learning, Memory, and Cognition, 15, 432-442.

Hacker, D. L., Bol, L., Horgan, D.D., & Rakow, E.A. (2000), Test prediction and performance in a classroom context. Journal of Educational Psychology, 92, 160-170.

Koriat, A., & Bjork, R. A. (2005). Illusions of competence in monitoring one's knowledge during study. Journal of Experimental Psychology: Learning, Memory, and Cognition, 31, 187-194.

10/28 – Metacognition: Control

Koriat, A., & Goldsmith, M. (1996). Monitoring and control processes in the strategic regulation of memory accuracy. Psychological Review, 103, 490-517.

Kelley, C. M., & Jacoby, L. L. (2000). Recollection and familiarity. In E. Tulving & F. I. M. Craik (Eds.), The Oxford handbook of memory (pp. 215-228). Oxford University Press.

Thiede, K.W., Anderson, C.M., & Therriault, D. (2003). Accuracy of metacognitive monitoring affects learning of texts. Journal of Educational Psychology, 95, 66-75.

Nelson, T. O., & Leonesio, R. J. (1988). Allocation of self-paced study time and the "labor-in-vain effect". *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *14*, 676-686.

Karpicke, J. D. (2009). Metacognitive control and strategy selection: deciding to practice retrieval during learning. Journal of Experimental Psychology: General, 138, 469-486.

11/4 – Text & Discourse Processing

Gernsbacher, M. A., & Kaschak, M. P. (2013). Text comprehension. In D. Reisberg (Ed.), The Oxford handbook of cognitive psychology (pp. 462-474). Oxford University Press.

Graesser, A. C., & Forsyth, C. M. (2013). Discourse comprehension. In D. Reisberg (Ed.), The Oxford handbook of cognitive psychology (pp. 475-491). Oxford University Press.

Oppenheimer, D. M. (2006). Consequences of erudite vernacular utilized irrespective of necessity: Problems with using long words needlessly. Applied Cognitive Psychology, 20, 139-156.

Rawson, K. A., & Kintsch, W. (2005). Rereading Effects Depend on Time of Test. Journal of Educational Psychology, 97, 70-80.

Wiley, J., & Voss, J. F. (1999). Constructing arguments from multiple sources: Tasks that promote understanding and not just memory for text. Journal of Educational Psychology, 91, 301-311.

11/11 – Problem-Solving & Creativity

Mayer, R. E. (2013). Problem-solving. In D. Reisberg (Ed.), The Oxford handbook of cognitive psychology (pp. 769-779). Oxford University Press.

Simonton, D. K. (2000). Creativity: Cognitive, personal, developmental, and social aspects. American Psychologist, 55, 151-158.

Storm, B. C., & Angello, G. (2010). Overcoming fixation creative problem solving and retrieval-induced forgetting. Psychological Science, 21, 1263-1265.

Baird, B., Smallwood, J., Mrazek, M. D., Kam, J. W., Franklin, M. S., & Schooler, J. W. (2012). Inspired by distraction mind wandering facilitates creative incubation. Psychological Science, 23, 1117–1122.

Wiley, J. (1998). Expertise as mental set: The effects of domain knowledge in creative problem solving. Memory & Cognition, 26, 716-730.

University Requirements

Special Needs: The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. To determine if you qualify, please contact the Dean of Students at 471-6259; TTY 471-4641.

Religious Holy Day Observance: If an assignment or exam falls due on a day when you are observing a religious holy day, we will work with you to find a time to submit the work.

Academic Dishonesty and Plagiarism: The University of Texas at Austin takes academic dishonesty and plagiarism very seriously. Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. For further information, please visit http://deanofstudents.utexas.edu/sjs/academicintegrity.html.

The twelfth class day is **September 11**, which is the last day to possibly get a refund if you drop a class.

Safety information: Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.

Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.

In the event of an evacuation, follow the instruction of faculty or class instructors.

Do not re-enter a building unless given instructions by The University of Texas at Austin Police Department or Fire Prevention Services office.

Other important Emergency
Information: http://www.utexas.edu/safety/preparedness/

Behavior Concerns Advice Line: Use this resource to help fellow UT members about whom you have concerns BCAL: 232-5050