HSEM 3054H: The Agile Mind: Cognitive and Brain Bases (Spring 2014)

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Course Objectives
This seminar course will examine recent research findings from psychology and cognitive neuroscience to arrive at a better understanding of the conditions that foster, or impede, flexible thinking or “mental agility.” Two key questions will be examined throughout. First, what are the relative roles of predominantly controlled or deliberate modes of cognitive processing versus more automatic (or spontaneous) processes in enabling and sustaining creatively adaptive thinking? Second, how do mental representations at differing levels of specificity—highly abstract versus highly specific—contribute to flexible thinking?

Class Meetings
The course meets (unless indicated otherwise on the course outline) on Monday, 6.00–9.00 pm, in Science Teaching Student Services, Room 131A. It is important to attend each class.

Textbook and Readings
All readings for the course are available electronically through the course web page. On average, there will be ~50 pages of reading per week. Students are expected to have done the assigned readings before coming to class and, each week, will be asked to either prepare specific concepts and issues to discuss in the seminar on the basis of those readings, or to present and critique the readings in more formal small group presentations. You should bring a copy of all of the readings for a given class to class with you.

Course Requirements
Your course grade will be determined on the basis of five components: active class participation, class presentations, an exploration/application paper, a mini-poster preview of your final research proposal, and a final research proposal. Specific guidelines and grading criteria for each of these five components are provided on later pages of this syllabus; due dates are stated in bold on the following page.

The class presentation topics will be distributed in the second class meeting. The exploration/application paper, mini-poster, and final research proposal are due at the beginning of class on the stated date. No extensions are allowed. Late exploration papers and late research proposals will be penalized half a letter grade for each day they are late. The weekend counts as one day.

Grading:  
Presentations 25%  
Mini-poster of research proposal 10%  
Class participation 20%  
Final research proposal 30%  
Exploration/application paper 15%

A = 85% and up; B = 75–84%; C = 65–74%; D = 55–64%; F = below 55%
Also +/- will be used for the grades at the upper/lower ends of the designated ranges.
Notes: Readings are listed in recommended order.
C – designates class meeting with concepts assignments
P – designates class meeting with presentations

Jan. 27 The Agile Mind
What is mental agility and why is it important; distinguishing agility of mind

Feb. 3 Levels of control (LoC) and levels of specificity (LoS): Empirical and conceptual overview (C)

Feb. 10 Four examples of agility of mind: reactive vs. spontaneous flexibility; modulating automaticity; insight; adaptive expertise (combining “wise repeatings” with “novel reachings”) (C)

Feb. 17 Adaptive use of varying LoS and varying LoC (P)
• Koutstaal & Binks (in prep/2014). AMAO, pp. 83–89 [practice, repetition, and structuring our idea search]; pp. 89–95 [effortful planning and doing]; pp. 95–98 [brain bases of cognitive control and spontaneity]


Feb. 24 Thinking with our senses: The perceptual—and environmental—grounding of thought (P)


Mar. 3 Action and motivation: Learning to vary, action identification, and habits (C)

• Koutstaal & Binks (in prep/2014). *AMAO*, pp. 112–120 [motivating exploration and learning to vary]


Mar. 10 Emotion/Personality/Self: Positive emotion and emotion-cognition interactions (P)


• Koutstaal & Binks (in prep/2014). *AMAO* [pp. 20–24, re-read the interpenetrating domains of concepts, perception, emotions, and action/motivation]

**EXPLORATION/APPLICATION PAPER DUE (start of class)**

Mar. 17  Spring Break

Mar. 24  Personality/Self/Values: Openness to experience, curiosity, self-affirmation, resilience (P)


Mar. 31  Thoughts about thoughts: Controlling control, epistemological beliefs, and "flow" (C)


• Koutstaal & Binks (in prep/2014). *AMAO*, pp. 109–112 [made and found constraints]

Apr. 7  Environmentally induced brain paths to mental agility (P)


• Tranter, L. J., & Koutstaal, W. (2008). Age and flexible thinking: An experimental demonstration of the beneficial effects of increased cognitively stimulating activity on


**Apr. 14** Further interventions to improve mental agility, creativity, and resilience in individuals and groups (P) [subgroups of class as X and Y, with six presentations, paper blitz!]


**Apr. 21** MINI-POSTER PRESENTATION OF RESEARCH PROPOSALS

**Apr. 28** Brain bases of levels of control, levels of specificity, and flexibility (P)


**May 5** Informal 5-10 minute presentation of term paper topic and process (informal P)


**FINAL RESEARCH PROPOSAL DUE (start of class)**
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POLICIES AND STANDARDS

Grading Standards

The official University grading standards are as follows:
A: Achievement that is outstanding relative to the level necessary to meet course requirements
B: Achievement that is significantly above the level necessary to meet course requirements
C: Achievement that meets the course requirements in every respect.
D: Achievement that is worthy of credit even though it fails to meet fully the course requirements
S: Achievement that is satisfactory, which is equivalent to a C- or better (achievement required for an S is at the discretion of the instructor but may be no lower than a C-).
F (or N): Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.
I (Incomplete): Assigned at the discretion of the instructor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between instructor and student.

Policy on Scholastic Dishonesty

Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course. The College of Liberal Arts has broadly defined scholastic dishonesty as “any act violating the rights of another student in academic work or involving misrepresentation of your own work. Scholastic dishonesty includes, but is not necessarily limited to, cheating on assignments or examinations; plagiarizing, which is misrepresenting as your own work any part of work done by another; submitting the same work, or substantially similar works, to meet the requirements of more than one course without the approval and consent of all instructors concerned; depriving another student of necessary course materials; or interfering with another student's work.”

Workload

For undergraduate courses, 1 credit is defined as equivalent to an average of 3 hours of learning effort per week (over a full semester) necessary for an average student to achieve an average grade in the course. For example, a student taking a 3 credit course that meets for 3 hours a week should expect to spend an additional six hours a week on coursework outside the classroom.

Miscellaneous

Students are responsible for all information disseminated in class and all course requirements, including deadlines and examinations. A student is not permitted to submit extra work in an attempt to raise his or her grade. Inquiries regarding any change of grade should be directed to the instructor of the course. Make-up examinations will be arranged, if necessary, for legitimate and properly documented absences. Students with disabilities that affect their ability to participate fully in class or to meet all course requirements are encouraged to bring this to the attention of the instructor so that appropriate accommodations can be arranged. University policy prohibits sexual harassment as defined in the December 1998 policy statement, available at the Office of Equal Opportunity and Affirmative Action. Questions or concerns regarding sexual harassment should be directed to this office, located in 274 McNamara Alumni Center.
Reading Guidance Notes

As you read articles, for class and for your papers, keep the following 3 questions in mind:

1. How does the article fit or square with the iCASA framework, and in what ways?
   - how are different LoC or LoS (across different domains) involved?
   - what are the implications for situationally adaptive use of LoC or LoS?
   - how is the role of the environment taken into account?
   - what have we learned about the brain bases of agile thinking?

2. How well does the article “make its case”?
   - any methodological concerns?
   - are the conclusions supported by the data?
   - are there viable alternative interpretations?
   - what’s missing?

3. How would you extend the ideas in the paper?
   - to another domain, such as business, law, or theater
   - to organizations/groups, to children, to animals
   - what other research questions or experiments might extend the methods
     or approach used, or test viable alternative interpretations?

Class Participation and Concepts Assignments

The topic “concepts” assignments for the early class meetings are intended to help you to read the papers and learn and think about some of the relevant concepts, methods, and research findings, not only individually, but as a collaborative “thinking group.”

Your responses to each topic are due no later than noon on the Sunday before each class (and preferably earlier).

Your class participation grade will be based on a combination of the following factors:

1. your written contribution is an accurate, thorough, and thoughtful treatment of your topic(s),
2. your contribution demonstrates an attempt to actively understand, and individually express your understanding of the topic by, for example, relating it to other concepts in the course or from other courses, using your own examples, providing constructive criticisms, caveats or qualifications, etc.,
3. during the class you do more than simply present your own topic(s): you also ask questions and offer comments, respond to the contributions of others, and demonstrate that you are attempting to integrate concepts and research findings across the readings for each class and across the classes.

Note that although we will not necessarily talk about every assigned reading during class time, you are responsible for reading all of the papers, and should demonstrate that you have read them, and thought critically about them, in your papers and presentations.

Post-Class Overview and Integration Discussion Groups

The final 10-15 minutes of some classes will be devoted to post-class overview and integration discussion groups. In these groups (comprised of between 2 to 4 individuals), you will be asked to collaboratively agree upon what you see as the fundamental and broad “take home messages” of the class, and to outline important remaining questions from the readings. Assignment to the groups will be determined pseudo-randomly, changing each week, so that the composition of the groups will vary from class to class. Each group will be asked to provide a written summary that will
be reviewed at the beginning of the following class. Summaries will be graded as complete/incomplete for each participant, and will contribute to your class participation grade.

Presentations

On the second day of class, you will be asked to choose three class presentation topics from the options provided. These presentations will be given by small groups of two or three students (with different groups or pairs of students working together for each presentation).

Two of the class presentations will involve presentations of one of the assigned readings. These individual article presentations should provide an organized, coherent, and clear overview of the assigned article that could be understood by someone who had not read the original paper. ** An e-mailed copy of your presentation is due not later than noon on the Wednesday before the presentation. Failure to email the presentation by the deadline will result in a deduction of 10% for the presentation. **

A third presentation will, instead, require drawing broader cross-connections between the assigned articles on a given day and across the course to date, and expanding on the relevance and implications of those readings. These presentations thus should assume that everyone understands the “content” of the relevant articles; they are intended to help us think about meaning of the findings and concepts, and to creatively consider possible applications and extensions, such as additional hypotheses that might be tested. ** An e-mailed copy of your presentation is due not later than noon on the Sunday before the presentation. Failure to email the presentation by the deadline will result in a deduction of 10% for the presentation. **

Your presentations are to be given on the stated date, and will be graded. Any failures to present on the stated date will be assigned a failing grade unless an acceptable excuse such as serious illness (documented by a doctor’s note) is provided. Each presentation should be about 15-20 minutes long, with an additional 5 minutes provided for questions and discussion.

Your grade for the presentations will be based on the following (equally weighted) criteria:

1. Overall structure of presentation
   a) Introduction: Overview perspective
   b) Clearly defined new terms and methods
   c) Conclusion: Importance/relevance
   d) Connection to other class material

2. Overall content
   a) Accuracy of information
   b) Level of specificity of information
      (good balance between detailed/specific and abstract/conceptual)

3. Presentation format
   a) Use of visual aids/graphics
   b) Audibility and verbal expression
   c) Engagement with audience

4. Creativity/originality

5. Answering questions
Exploration/Application Paper
These brief papers (approximately 4 double-spaced pages) provide an opportunity for you to creatively explore broader connections between the ideas we are encountering in the class and other concepts or problems that you are working on or are thinking about. Although there will be considerable individual variability in the approach and topics chosen, all papers should demonstrate clarity of thought and expression and provide a well-structured and thoughtful treatment of the chosen topic. Papers will typically include only 3-4 highly selected references and should include an abstract of between 120 and 150 words.

Your grade for the exploration/application paper will be based on the following criteria:
- Accuracy and thoroughness 30%
- Originality and integrative thought 40%
- Organization and writing 30%
  - e.g., introduction, conclusion, abstract, spelling, diction

Mini-Poster of Research Proposal
Each student will be required to prepare a “mini-poster” for presentation at a class conference session two weeks before the formal research proposal is due. The mini-poster should be comprised of four 8.5” x 11” pages using 12-point font and present the proposed rationale, methods, hypotheses, and expected results of the study that will be included in the final research proposal in a visually engaging manner for presentation and discussion with the class. The objective is to obtain (and give) constructive peer feedback on your research proposal that can be used to modify and improve the final proposal.

A strong mini-poster would be expected to meet all or most of these criteria:
- Title – informative, accurate, 56 characters or fewer
- Rationale – brief and clear statement of aims and hypotheses
- Methods – summary of subjects, main procedures, and measures
- Results – predicted results (diagrammed or displayed for ease of understanding)
- Conclusion – interpretation(s) and future direction(s)
- Overall – well-structured, visually engaging, clear

Final Written Research Proposal
The final written research proposal should be about 3,000 words and 5 single-spaced pages, including references, figures, tables, and appendices. The research proposal must be directly related to topics that we have covered in the course. It should be original and must be your own work entirely. That is, it must not be (a) a study that has already been conducted by you or other researchers, (b) a study that you have proposed for another course or for a thesis or major project. The proposal should include:

1. A title (not to exceed 56 characters);
2. Project Description (5 single-spaced pages. Use Times 11+ points and leave 0.7”+ margin on each side). It should include: A brief review of the relevant literature, aims and hypotheses, research design and methods, and predicted results and interpretation of possible results. Selected references should be cited as necessary.

The final written proposal is due at 5:00pm on Friday May 9. The paper should be submitted on Moodle before 5:00 pm that day. Late submissions will not be accepted and will be assigned zero points.
A strong research proposal would be expected to meet all or most of these criteria:

**Title** – informative, accurate, 56 characters or fewer

**Literature review**
- clearly situates the problem or issue to be investigated
- is concise and focused and related to one or more course topics
- includes about 4-8 well-selected references

**Aims and hypotheses**
- clearly describes the hypothesis (or hypotheses)
- the hypothesis (hypotheses) is (are) well-connected to the literature review
- addresses an original question

**Research design and methods**
- describes the participants and their characteristics (who, how many)
- outlines the experimental procedure (what is done, and when, to who)
- states independent (manipulated) and dependent (measured) variables
- specifies appropriate controls and/or manipulation checks (as necessary)
- identifies what statistical tests will be used (e.g., t-test or ANOVA for testing differences between means, correlation for testing the relation between two measures)

**Predicted results**
- clearly describes the primary anticipated outcomes (e.g., the expected pattern of means or of the correlations between measures)

**Interpretation/conclusion**
- provides an interpretation of results and alternative interpretations or accounts
- notes one or two limitations of the proposed research approach
- outlines a possible future research question

**Overall**
- well-written, well-structured

**Reference Sources and Bibliographic Guidance**
It is recommended that you use Web of Science (ISI) for topic, author, and key word searches, and also to do citation searches on articles, so as to find the most recent and relevant research on a topic. The link to Web of Science is provided under the subheading “Databases” on this page: https://www.lib.umn.edu/
To find other articles that have cited a given paper, either click on the “times cited” link for the paper (to the far right of the title), or use the “cited reference search” tab to search for other papers that cite a given author or paper, etc. Use the “Find It” or “Full Text” links to obtain electronic copies (pdfs) of the articles. You can also change the order in which articles are listed (e.g., with the most recent articles first, or the most frequently cited first).

**Additional Academic and Personal Resources**
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via www.mentalhealth.umn.edu.

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations. If you are registered with DS and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.