HDE 163 - COGNITIVE NEUROPSYCHOLOGY in ADULTHOOD & AGING (version: 9-25-2017)**;** U.C. Davis, Fall Quarter, 2017
Instructor: Professor Beth A. Ober
Time/Place of class: Monday & Wednesday 2:10 - 4:00 pm, Olsen 250
Prof. Ober's Office Hours: Monday, 4:10-5:00 & Thursday, 3:30-4:30
(from Sept 28 - Dec 7)
1357 Hart Hall; additional office hours by appointment
Ober's email address: baober@ucdavis.edu
Ober's phone number: 530-752-6934
Teaching Assistant: Ryan Phillips (rcphillips@ucdavis.edu)
Phillips' Office Hours: Wednesday, 1:10-2:00; 245 Young Hall

Course Goals. Students will be exposed to theories, methods, and findings from cognitive neuropsychology and cognitive neuroscience, with an emphasis on comparing and contrasting differences between normal and abnormal aging. The reading assignments and lectures will be enhanced via case study presentations (presented via slides & video) of brain-damaged patients (e.g., with amnesia, aphasia, Alzheimer's disease) and via slide presentations of neuroimaging studies with groups of younger and/or older adults engaged in specific cognitive tasks. Students will be expected to: (a) acquire a working knowledge of the relationship between cognitive processes and brain functioning in adulthood & aging; (b) understand the mutual benefits of neuropsychological case studies, group data from similar types of brain-damaged individuals, and group data from normal adults; (c) become competent in asking critical questions about brain-cognition relationships; and (d) write a short research paper that compares and contrasts two alternative treatments for a neurocognitive disorder/issue in adulthood.

Prerequisites. The only prerequisite for this course is PSC 1. HDE 100C (Adult Development and Aging) is recommended, but not required. Although no prior coursework in cognitive psychology or neurosciences is required, the course will be appropriate for students who have such background as well as for those who do not have such background.

Course Website. The HDE 163 course website can be found on UCD Canvas. The website contains the course syllabus and handouts, as well as the assigned readings/articles that are not in the course textbook. The website will also contain the lecture slides. The instructor will usually put the lecture slides onto the website by the late evening of the day prior to each class meeting; however, these slides may deviate slightly from the slides actually used in lecture (i.e., the instructor may make some last-minute changes). It is also important for students to realize that the lecture slides comprised of text (as opposed to pictures/figures) are simply the outline and/or "bullet points" for the topics being discussed. Thus, the slides, by themselves, will *not* be an adequate alternative for attending, and taking notes in, lecture.

Textbook. The primary source of readings for this class is a textbook by Kempler, D. (2012), *Neurocognitive Disorders in Aging*, The Porifora Press/ Harvard Book Store, Cambridge, MA. It is available for purchase at the UCD Bookstore ($24.00), or as a "print to order" (paperback) textbook from the Harvard Book Store ($20.00, plus $5.00 shipping): www.harvard.com/book/neurocognitive_disorders_in_aging/
Two copies of this textbook will also be available at the 2-Hour Reserve Desk in Shields Library.

Additional Readings. As listed in the syllabus, and provided on the course website, you will have additional *required* (and some recommended) readings, which are comprised of book chapters and journal articles.

Grading Percentages and Course Requirements. Letter grades will be assigned based on the following components: midterm - 30%; final - 37%; term paper - 30%; online assignment for Thanksgiving week - 3%. Approximately 80% of the final exam will focus on material covered during the second half of the quarter; however, there will also be some questions from the first half of the quarter with an emphasis on concepts that occurred throughout the quarter. There are no alternate dates for the exams. Missed exams will be given "0" points, unless the student has a valid medical or personal emergency for which appropriate documentation is provided (e.g., letter from physician). In the event of a valid medical/personal emergency, it is up to the discretion of the instructor as to whether a special make-up exam will be given or the grades of the other course components will be re-weighted to make up for the missing exam.

Term Paper. For the term paper, worth 30% of the graded points, and which is due as an upload to UCD Canvas on **November 15, at 1:30pm,** you will write a six-page paper that contrasts & compares two different treatments for one type neurocognitive disorder/issue (e.g., a specific type of aphasia, a specific type of memory disorder, Alzheimer's disease, etc.). This six-page paper can be no less than 5.5, and no more than 6.5, double-spaced, 12-point-font pages. You may use class-assigned material, but you must refer to at least four additional sources/references from the research literature, including at least two references for *each of the two treatments/therapies* that you will be discussing. These four, total, additional references must all come from primary sources (i.e., empirical or review papers published in peer-reviewed academic journals). The **November 15, 1:30pm,** deadline is firm; late papers will be penalized at the rate of 10% of the points (i.e., 3 out of 30 points) for the first day that the paper is late, and 5% of the points (i.e., 1.5 out of 30 points) for each additional day that the paper is late. Note that a special handout will be made available on Canvas, containing more detailed instructions for the term paper.

CLASS SCHEDULE & REQUIRED READINGS

September 27 (Wed.) - Introduction to Course

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. The Porifora Press/ Harvard Book Store, Cambridge, MA. Chapter 1 - How Do Younger and Older Patients Differ?

Greenwood, P.M. and Parasuraman, R. (2012). *Nurturing the Older Brain and Mind*, Chapter 1 - Global Aging and Cognitive Functioning.

Required Reference Chapter:
Coltheart, M. (2001). Assumptions and methods in cognitive neuropsychology. In B. Rapp (Ed.), *The Handbook of Cognitive Neuropsychology* (pp. 3-21). Philadelphia, PA: Psychology Press. [The Coltheart chapter will be a valuable reference; you will likely want to return to this chapter throughout the quarter, including during the writing of your paper.]

October 2 (Mon.) - Structural Brain Changes and Aging

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 2 - Brain Basics.

Greenwood, P.M. and Parasuraman, R. (2012). *Nurturing the Older Brain and Mind*, Chapter 3 - Brain Aging and Cognitive Aging, pages 19-28.

Akst, J. (2015). Brain Gain. Young neurons in the adult human brain are likely critical to its function. *The Scientist*, *29*, October issue).

Recommended:
Burgmans, S., et al. (2009). The prevalence of cortical gray matter atrophy may be overestimated in the healthy aging brain. *Neuropsychology, 23*, 541-550.

October 4 (Wed.) - Functional Brain Changes and Aging

Gazzaniga, M. S., Ivry, R. B., & Mangun, G. R. (2009). *Cognitive Neuroscience: The Biology of the Mind (3rd Edition)*. New York, NY: W. W. Norton & Company, pages 130-133; 141-159. [These pages are among those in the PDF posted on UCD Canvas; this reading is of the "reference-type"; you will likely want to re-read sections of it throughout the quarter.]

Greenwood, P.M. and Parasuraman, R. (2012). *Nurturing the Older Brain and Mind*, Chapter 3 - Brain Aging and Cognitive Aging, pages 28-48.

Recommended:
Yuste, R, & Church, G. M. (2014). The new century of the brain. *Scientific American*, March 2014, 38-45.

October 9 (Mon.) - Overview of Cognitive Changes with Normal Aging; Neurocognitive Scaffolding

Zillmer, E.A., Spiers, M.V., & Culbertson, W.C. (2008), *Principles of Neuropsychology, 2nd Ed*. Belmont, CA: Thompson-Wadsworth. Chapter 14 (Normal Aging and Dementia: Alzheimer's Disease), pages 400-405 only.

Park, D. C., and Reuter-Lorenz, P. (2009). The Adaptive Brain: Aging and Neurocognitive Scaffolding. *Annual Review of Psychology, 60,* 173-196.

October 11 (Wed.) - Alzheimer's Disease and other Dementias

Zillmer, E.A., Spiers, M.V., & Culbertson, W.C. (2008), *Principles of Neuropsychology, 2nd Ed*. Belmont, CA: Thompson-Wadsworth. Chapter 14 (Normal Aging and Dementia: Alzheimer's Disease), pages 405-421 only.

Stix, G. (2015). Alzheimer's: Forestalling the darkness. Interventions before symptoms appear could be key to slowing or stopping the leading cause of dementia. *Scientific American, 24* (March 2015, Special Issue), 67-75.

October 16 (Mon.) - Stroke; Huntington's & Parkinson's Disease

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 3, and Chapter 13, pages 227-236 only, i.e., section labeled "Subcortical Movement Disorders".

Recommended:
Robottom, B. J. and Weiner, W. J. (2009). Parkinson's Disease Dementia. *Current Psychiatry Reviews, 5***,** 218-225**.**

October 18 (Wed.) - Language in Normal Aging; Aphasia

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 4 - Aphasia: Disorders of Language.

Bialystok, E., Abutalebi, J., Bak, T.H., Burke, D., & Kroll, J. (2016). Aging in two languages: Implications for public health. *Aging Research Reviews, 27,* 56-60.

October 23 (Mon.) - Visuospatial Deficits and Agnosia: Part I

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 7 - Visuospatial Deficits.

Loetscher, T., & Brugger, P. (2007). A disengagement deficit in representational space. *Neuropsychologia*, *45*, 1299-1304.

October 25 (Wed.) - Visuospatial Deficits and Agnoisa: Part II

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 8 - Agnosia: Disorders of Recognition.

Barton, J. S., Cherkasova, M. V., & Hefter, R. (2004). The covert priming effect of faces in prosopagnosia. *Neurology*, *63*, 2062-2068.

October 30 (Mon.) - Frontal Lobe & Executive Functions: Part I

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 9 - Problem-Solving Deficits.

November 1 (Wed.) - Frontal Lobe & Executive Functions: Part II

Kim, S., Hasher, L., & Zacks, R. T. (2007). Aging and a benefit of distractibility. *Psychonomic Bulletin & Review*, *14*, 301-305.

Verhaeghen, P. (2011). Aging and executive control: Reports of a demise greatly exaggerated. *Current Directions in Psychological Science, 20*, 174-180.

November 6 (Mon.) - MIDTERM EXAM

Please bring a scantron form, and a #2 pencil.

November 8 (Wed.) - Memory and Aging: Part I

Baddeley, A. (2015). "Memory and Aging", Chapter 15 from *Memory, 2nd Edition* (2015), Baddeley A., Eysenck, M.W. & Anderson, M. C. London & New York, Psychology Press.

Ober, B.A. (2010). Memory, brain and aging: The good, the bad and the promising. *California Agriculture, 64*, 174-182. [This is a general-audience review article, which is part of a special issue on "California Aging".]
Please download from:
http://ucanr.edu/repositoryfiles/ca6404p174-79314.pdf

November 13 (Mon.) - Memory and Aging: Part II

Arkowitz, H., Lilienfeld, S.O., & Fan, S. (2015). *Scientific American, 24*, (two very short back-to-back articles on memory and aging, March 2015, Special Issue), 34-37.

Harrison, T. M., Weintraub, S., Mesulam, M.-M., & Rogalski, E. (2012). Superior memory and higher cortical volumes in unusually successful cognitive aging. *Journal of the International Neuropsychological Society, 18*, 1-5.

Recommended:
Jacoby, L. L. & Rhodes, M. G. (2006). False Remembering in the Aged.
Current Directions in Psychological Science, 15, 49-53.

November 15 (WEDNESDAY) -- TERM PAPER DUE -- (uploaded to UCD Canvas by 1:30pm, Wed.)

November 15 (Wed.) - Amnesia; Hyperthymestic Syndrome

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 10 - Amnesia: Disturbances of Memory.

Squire, L.R. (2009). The Legacy of Patient H.M. for Neuroscience. *Neuron, 61*, 6-9.

November 20 (Mon.) - Neuropsychological Assessment

Woodford, H. J. & George, J. (2007). Cognitive assessment in the elderly: A review of clinical methods. *Quarterly Journal of Medicine, 100*, 469-484.

November 22 (Wed.) - NO CLASS MEETING - instead, there is a required online assignment, due by 11:00pm, Saturday, Nov. 25

Assignment: try out one of the online "brain training" programs for 2 hours; then answer the provided questions about your experience/opinion, and upload to Canvas.
This assignment is worth 3 points (out of 100 total points) towards your course grade.
Details about this assignment are posted on Canvas.

Reference Article: Simons et al. (2016). Do brain training programs work? *Psychological Science in the Public Interest, 17* (3), 103-186. [You should skim this article, and refer back to it, for more specific information, as needed.]

November 27 (Mon.) - Successful Cognitive Aging: Part I - Physical Exercise/Activity

Kempler, D. (2012). *Neurocognitive Disorders in Aging*. Chapter 14 - Successful Cognitive and Physical Aging.

Hertzog, C., Kramer, A. F., Wilson, R.S., Lindenberger, U. (2015). Fit Body, Fit Mind? *Scientific American, 24*, 40-47.

Hayes, S. M., Hayes, J. P. Cadden, M. & Verfaellie, M. (2013). A review of cardiorespiratory fitness-related neuroplasticity in the aging brain. *Frontiers in Aging Neurosciences, 5,* July 2013, Article 31, 1-16.

Recommended :
Watson, N. et al. (2015). No Pain, No Gain: Lack of Exercise Obstructs Neurogenesis. *Cell Transplantation* ("Proposal"), *24,* 591-597.

Colcombe, S., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Science*, *14*, 125-130.

November 29 (Wed.) - Successful Cognitive Aging: Part II - Mental Exercise/Activity

Makin, S. (2015). Can you train your brain? *Scientific American Mind*, July/August 2015, 64-69.

Anguera, J.A., Boccanfuso, J. L., Rintoul, O., … Gazzaley, A. (2013). Video game training enhances cognitive control in older adults. *Nature, 501*, 97-101. doi:10.1038/nature12486.

Recommended:
Carlson, M. C. *et al.* (2009). Evidence for Neurocognitive Plasticity in At-Risk Older Adults: The Experience Corps Program. *Journal of Gerontology: Medical Sciences, 64*, 1275–1282.

Chapman, S. B., & Mudar, R. A. (2014). Enhancement of cognitive and neural functions through complex reasoning training: evidence from normal and clinical populations. *Frontiers in Systems Neurosciences, 8,* April 2014, Article 69, 1-7.

Stough, C. & Pase, M. P. (2015). Improving cognition in the elderly with nutritional supplements. *Current Directions in Psychological Science, 24*, 177-183.

December 4 (Mon.) - Successful Cognitive Aging: Part III - Social Exercise/Activity

Ybarra, O., Winkielman, P., Yeh, I., Burnstein, E., & Kavanagh, L. (2011). Friends (and Sometimes Enemies) With Cognitive Benefits: What Types of Social Interactions Boost Executive Functioning? *Social Psychological and Personality Science, 2*(3), 253-261.

Reed, A. E., & Carstensen, L. L. (2012). The theory behind the age-related positivity effect. Frontiers in Psychology, 3, Article 339, 1-9.

Recommended:
Bennett, D.A., Arnold, S.E., Valenzuela, M.J., Brayne, C., & Schneider, J. A. (2014). Cognitive and social lifestyle: links with neuropathology and cognition in late life. *Acta Neuropathologica, 127*, 137-150.

Carlson, M.C., et al. (2015). Impact of the Baltimore Experience Corps Trial on cortical and hippocampal volumes. *Alzheimer's & Dementia, 11,* 1340-1348.

December 6 (Wed.) - Review Session (please bring your questions to this review session)

DECEMBER 15 (Friday) - 8:00-10:00am: FINAL EXAM (please bring a Scantron form and a #2 pencil) (Note: this class has Exam Code "U")