

**PSYC 311 Fall**

**HUMAN COGNITION AND THE BRAIN**

**2016**

Instructor: Michael Petrides

Time: Tuesday and Thursday from 4:05 to 5:25 pm

Place: Adams Auditorium

- Content:
- I     Introduction and Basic Neuroanatomy
  - II    The Nature of Brain Lesions
  - III   Functional Asymmetry of the Cerebral Hemispheres
  - IV    Language Disorders
  - V     Apraxia
  - VI    Visuo-perceptual Disorders
  - VII   Somatosensory Disorders
  - VIII  Spatial Disorders
  - IX    Memory Disorders
  - X     The Frontal Lobes
  - XI    Personality Changes Associated with Brain Damage
  - XII  The Effect of Early Brain Lesions

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Todd Vogel todd.vogel@mail.mcgill.ca  
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Sonia Israel (undergrad TEAM TA) sonia.israel@mail.mcgill.ca

Note: Weekly conferences will be held by Trisanna, Todd, and Elise. Please verify on MyCourses for dates and times of conferences and office hours.

Evaluation: There will be a final examination counting for 70% of the course grade and a mid-term class test counting for 30% of the course grade. The method of evaluation and the format of the examinations may have to be changed in the event of circumstances beyond the instructor's control.

Participant Pool: Students will have the opportunity to have an additional 1% added to their overall grade by participating in the Psychology Participant Pool. Students can either participate in a departmental study and submit a short report, or read a chosen article and answer various questions.

Supplemental Examination: One will be offered.

Statement about academic integrity:

The University requires that the present statement appears on student course outlines: McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see [www.mcgill.ca/integrity](http://www.mcgill.ca/integrity) for more information).

Please Note: The mid-term test will be held during class time. If a student misses the mid-term examination for a valid reason (e.g., illness, conflict with another examination), the student will write the final examination for 100% of the course grade.

Readings: The articles have been assembled as a coursepack and have also been placed on Reserve in the Redpath Undergraduate Library. Required readings will be assigned mainly, but not exclusively, from the articles on this list.

**Readings: (BOOKS)**

**(These are not required books. They are books that students might wish to consult for additional reading if interested in the course material)**

Andrewes, D. (2015). *Neuropsychology: From Theory to Practice*. Psychology Press.

Benson, D.F. and Blumer, D. (1982). *Psychiatric Aspects of Neurological Disease*. Grune and Stratton.

Brodal, A. (1993). *Neurological Anatomy in Relation to Clinical Medicine*. Oxford University Press. 3<sup>rd</sup> Edition.

Carpenter, M.B. (1991). *Core Text of Neuroanatomy*. Williams, Wilkins. 4<sup>th</sup> Edition.

Corkin, S. (2013). *Permanent Present Tense. The Unforgettable Life of the Amnesic Patient H.M.* Basic Books, New York.

Eichenbaum, H. and Cohen, N. J. (2001). *From Conditioning to Conscious Recollection. Memory Systems of the Brain*. Oxford University Press.

Haecaen, H. and Albert, M.L. (1978). *Human Neuropsychology*. Wiley Inter-Science.

Heilman, K.M. and Valenstein, E. (2011). *Clinical Neuropsychology*. Oxford University Press, 5<sup>th</sup> Edition.

Kolb, B. and Wishaw, I.Q. (2015). *Fundamentals of Human Neuropsychology*. Worth Publishers, 7<sup>th</sup> Edition.

McCarthy R.A. and Warrington, E.K. (1990). *Cognitive Neuropsychology. A Clinical Introduction*. Academic Press.

Nieuwenhuys, R., Voogd, J., and van Huijzen, C. (2008). *The Human Central Nervous System*. Springer Verlag, 4<sup>th</sup> Edition.

Petrides, M. (2012). *The Human Cerebral Cortex. An MRI Atlas of the Sulci and Gyri in MNI*

Stereotaxic Space. Academic Press, New York.

Petrides, M. (2014). Neuroanatomy of Language Regions of the Human Brain. Academic Press, New York.

Rains, G. D. (2002). Principles of Human Neuropsychology. McGraw Hill.

Squire, L. (1987). Memory and Brain. Oxford University Press.

Stuss, D.T. and Knight, R.T. (Eds.). (2013). Principles of Frontal Lobe Function. Oxford University Press, New York. 2<sup>nd</sup> Edition.

Walsh, K.W. (1987). Neuropsychology. Churchill Livingstone, 2<sup>nd</sup> Edition.

### **Readings: (Articles)**

Gross Anatomy of the Brain. Ch. 2, pp. 26-57. In: Carpenter, M. B. and Sutin, J. Human Neuroanatomy. Williams, Wilkins, 1983.

The Visual Pathways. Ch. 15, pp. 539-545. In: Carpenter, M. B. and Sutin, J. Human Neuroanatomy. Williams, Wilkins, 1983.

The Cerebral Cortex. Ch. 19, pp. 643-673. In: Carpenter, M. B. and Sutin, J. Human Neuroanatomy. Williams, Wilkins, 1983.

Walsh, K. W. Elements of neurology. Ch. 3. In: Walsh, K.W. Neuropsychology, Churchill-Livingston.

Gazzaniga, M.S. The split brain in man. Scientific American, 1967, 217, 24-29.

Gazzaniga, M.S. The split brain revisited. Scientific American, 1998, 279 (1), 50-55.

Geschwind, N. The organization of language and the brain. Science, 1970, 170, 940-944.

Mohr, J.P. Broca's aphasia. In H. Witaker & N.A. Whitaker, Studies in neurolinguistics, Vol. 1, 1976.

Dronkers, N.F. A new brain region for coordinating speech articulation. Nature, 1996, 384, 159-161.

Rasmussen, T., & Milner, B. Clinical and surgical studies of the cerebral speech areas in man. In K.J. Zulch et al., Cerebral localization. New York: Springer-Verlag, 1975.

Geschwind, N. The apraxias. In E.W. Straus & R.M. Griffith (Eds.), Phenomenology of Will and Action. Duquesne University Press, 1967. pp. 91-102.

Rothi, L.J.G., Ochipa, C., and Heilman, K.M. (1991). A cognitive neuropsychological model of limb praxis. Cognitive Neuropsychology, 8:6, 443-458.

Newcombe, F., and Ratcliff, G. Disorders of visuospatial analysis. In: F. Boller and J. Grafman (Eds.) Handbook of Neuropsychology, 1989, Vol. 2, pp. 333-356.

Benton, A. Constructional apraxia. In: F. Boller and J. Grafman (Eds.) Handbook of Neuropsychology, 1989, Vol. 2, pp. 387-394.

Mishkin, M., Ungerleider, L.G. & Macko, K.A. Object vision and spatial vision: two cortical pathways. Trends in Neurosciences, 1983, 6, 414-417.

Rubens, A.B. Agnosia. In K.M. Heilman and E. Valenstein (Eds.), Clinical Neuropsychology. Oxford University Press, 2nd ed., Ch. 9, pp. 233-267.

Damasio, A.R., Tranel, D. and Damasio, H. Disorders of visual recognition. In: F. Boller and J. Grafman (Eds.) Handbook of Neuropsychology, 1989, Vol. 2, pp. 317-332.

Tanaka, K., Saito, H., Fukada, Y., and Moriya, M. Integration of form, texture, and color information in the inferotemporal cortex of the macaque. In: E. Iwai and M. Mishkin (Eds.), Vision, memory and the temporal lobe. Elsevier Science Publishing Co., 1989, pp. 101-109.

Quiroga, R.Q., Reddy, L., Kreiman, G., Koch, C. and Fried, I. Invariant visual representation by single neurons in the human brain. Nature, 2005, 435, 1102-1107.

Connor, C.E. Friends and grandmothers. Nature, 2005, 435, 1036-1037.

Milner, B., Corkin, S., & H.-L. Teuber. Further analysis of the hippocampal amnesic syndrome: 14-year follow-up study of H.M. Neuropsychologia, 1968, 6, 215-234.

Milner, B. Psychological aspects of focal epilepsy and its neurosurgical management. In D.P. Purpura et al., (Eds.) Advances in neurology. New York: Raven Press, 1975.

Squire, L.R. & Zola-Morgan, S. The medial temporal lobe memory system. Science, 1991, 253, 1380-1386.

Annese, J., Schenker-Ahmed, N.M., Bartsch, H., Maechler, P., Sheh, C., Thomas, N., Kayano, J., Ghatan, A., Bresler, N., Frosch, M.P., Klaming, R., and Corkin, S. Postmortem examination of patient H.M.'s brain based on histological sectioning and digital 3D reconstruction. Nature Communications, 2014, 1-9.

Aggleton, J.P. The contribution of the amygdala to normal and abnormal emotional states. Trends in Neurosciences, 1993, 16, 328-333.

Milner B. and Petrides, M. Behavioural effects of frontal-lobe lesions in man. Trends in Neurosciences, 1984, 7, 403-407.

Petrides, M. Frontal lobes and memory. Ch. 4. In: Boller, F. and Grafman, J. (Eds.) Handbook of Neuropsychology, 2<sup>nd</sup> Edition, Vol. 2, 2000, Elsevier Science B.V.

Petrides, M. Working Memory, Neural Basis of. In: International Encyclopedia of the Social & Behavioral Sciences, J.D. Wright (editor-in-chief), Oxford: Elsevier, 2015, 2<sup>nd</sup> Ed., Vol 25, pp. 703–710.

Petrides, M. The Ventrolateral Frontal Region. In: Neurobiology of Language, G. Hickok and S.L. Small (Eds.), Academic Press: Elsevier, 2016, ch. 3, pp. 25-33.