PSYCH794– Fall 2015

Cognitive Neuroscience of face perception

*** Classes: Wednesdays 9.30-12pm PAS 3012 ***

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Course Description

The human face is one of the most important social stimuli we encounter every day. Multiple aspects of the face such as its identity, age, race, gender, emotion or gaze direction need to be extracted and processed rapidly and accurately by the brain to allow efficient social interactions. This seminar offers a multidisciplinary approach to the study of face perception. We will cover major aspects of face processing including the perception and recognition of identity, emotions and gaze direction, their neural bases and their links to social cognition and theory of mind. We will discuss fundamental papers integrating the most recent findings from neuropsychology, neuroimaging and cognitive psychology. We will also have the opportunity to look at face research from various imaging techniques (e.g. TMS, EEG, fMRI, patient cases). This course is most suited for students interested in brain-behaviour relationships.

Course Web Page

Announcements, readings, and grades will be posted on LEARN.

Readings

There is no textbook for this course. A preliminary set of readings is provided below.
However, this reading list is subject to change based on the interests of students in the class.
Readings will be posted on LEARN a week before the class.

Assessment

Weekly summaries (35% of grade): Each week, you will submit a two page critique of the week's readings, incorporating the two articles to read for that week. These summaries should be submitted to the instructor and the week's discussion leader (see below) no later than Tuesday noon prior to class. These summaries should be a synthesis of the readings and briefly address the following points:
1. The main point/finding of the articles
2. Theoretical and or practical significance
3. At least one strength
4. At least one potential weakness
5. At least one unanswered question

6. Relationship to other readings (either from the same week or a prior week).

Serving as discussion leader (30% of grade): Each student will be responsible for leading class one or more times (depending on enrollment). Being the discussion leader will involve presenting the week's assigned readings. This should not simply be a disjointed run-through of the methods and results of each article. Rather, as discussion leader, you should create a presentation on the week's topic, incorporating the articles as background, relating them, contrasting them, and possibly bringing in additional relevant readings. You may choose to incorporate into your presentation the issues/questions raised by other students in their summaries, or you may choose to save these issues for the discussion period that you will lead after the presentation. If your classmates' summaries indicate particular points of difficulty in the readings, you should attempt to clarify these points in the presentation. The discussion leader does not need to submit a written summary for that week. The presentation should be 10 to 15min with slides support and the rest of the class should be devoted to the discussion.

Class participation (35% of grade): Students are expected to contribute to the class discussions during weeks when they are not officially serving as discussion leader. Active participation is required in order for this to be an engaging experience.

Preliminary Schedule and paper listing (subject to change)

Articles might change depending on class interest. Papers will be posted on Learn at least one week prior to the class.

Date	Topic	Readings
Sept 16	**Orientation and planning session**	N/A
Sept 23	**Models of face perception**	Bruce, V., & Young, A. (1986). Understanding face recognition. British Journal of Psychology, 77, 305–327. Haxby JV, Hoffman EA, Gobbini MI. (2000). The distributed human neural system for face perception. Trends Cogn Sci. 4(6):223-233.
Sept 30	**Distributed versus modular processing**	Kanwisher N, Yovel G. (2006). The fusiform face area: a cortical region specialized for the perception of faces. *Philos Trans R Soc Lond B Biol Sci.* 361(1476):2109-28 Ishai A. Let's face it: it's a cortical network. (2008). *Neuroimage*. 40(2):415-419.
Oct 7	**Holistic, configural, featural processing**	Rossion, B. (2009). Distinguishing the cause and consequence of face inversion: The perceptual field hypothesis. A*cta Psychologica, 132,* 300-312. McKone, E; Yovel, G. (2009). Why does picture-plane inversion sometimes dissociate perception of features and spacing in faces,

		and sometimes not? Toward a new theory of holistic processing *Psychonomic Bulletin and Reviews*, 16(5): 778-797
Oct 14	**Prosopagnosia**	Rossion, B. (2008). Constraining the cortical face network by neuroimaging studies of acquired prosopagnosia. *NeuroImage,* 40, 423-426. Avidan, G; Behrmann, M. (2009). Functional MRI Reveals Compromised Neural Integrity of the Face Processing Network in Congenital Prosopagnosia. *Current Biol*, 19(13):1146-1150.
Oct 21	**Face neurons**	Rolls, E.T. (2007). The representation of information about faces in the temporal and frontal lobes. Neuropsychologia, 45(1), 124-143 Freiwald, W.A., Tsao, D.Y., Livingstone, M.S. (2009). A face feature space in the macaque temporal lobe. *Nature Neuroscience.* 12:1187-1196.
Oct 28	**Electrophysiology of face perception – The N170 ERP component**	Bentin S, Allison T, Puce A, Perez E, McCarthy G. (1996). Electrophysiological Studies of Face Perception in Humans. *J Cogn Neurosci.* 8(6):551-565. Rossion B, Jacques C. (2012). The N170: understanding the time course of face perception in the human brain. In: SJ Luck & ES Kappenman, Eds. The Oxford handbook of event-related potential components. Pp 115-141.
Nov 4	**Intracranial recordings in humans**	Barbeau EJ, Taylor MJ, Regis J, Marquis P, Chauvel P, Liégeois-Chauvel C. (2008). Spatio temporal dynamics of face recognition. *Cerebral Cortex*, 18(5): 997-1009. Allison T, Puce A, Spencer DD, McCarthy G. (1999). Electrophysiological studies of human face perception. I: Potentials generated in occipitotemporal cortex by face and non-face stimuli. *Cereb Cortex*. 9(5):415-30.
Nov 11	**Transcranial Magnetic Stimulation (TMS) approach**	Pitcher D, Walsh V, Yovel G, Duchaine B. (2007). TMS evidence for the involvement of the right occipital face area in early face processing. *Current Biol* 18;17(18):1568-73 Pitcher D, Charles L, Devlin JT, Walsh V, Duchaine B. (2009). Triple dissociation of faces, bodies, and objects in extrastriate cortex. *Current Biol* 19(4):319-24

Nov 18	**Gaze processing**	Duchaine B, Jenkins R, Germine L, Calder AJ. (2009). Normal gaze discrimination and adaptation in seven prosopagnosics. *Neuropsychologia*. 2009;47(10):2029-36. Nummenmaa L, Calder AJ. (2009). Neural mechanisms of social attention. *Trends Cogn Sci*. 13(3):135-43.
Nov 25	**Facial expressions**	Calder, AJ; Young, AW. (2005). Understanding the recognition of facial identity and facial expression. *Nature Reviews Neurosciences.* 6(8):641-651. Vuilleumier, P; Pourtois, G. (2007). Distributed and interactive brain mechanisms during emotion face perception: evidence from functional neuroimaging. *Neuropsychologia*, 45(1), 174-194.
Dec 2	**Developmental perspective**	Johnson MH. Subcortical face processing. (2005). *Nat Rev Neurosci*. 6(10):766-74. Senju A, Johnson MH. 2009. The eye contact effect: mechanisms and development. *Trends Cogn Sci*. 13(3):127-34