Course outline: PSYC 314 (Cognitive Methods)

Instructor: Zahra Hussain
Email: zahra.hussain@aub.edu.lb
Meeting times: Monday 2:00-4:30 pm
Location: Jesup 107
Office hours: Wednesday 2:00-4:00 pm
Evaluation: Four critiques (3 x 5% + final critique 10% = 25%), one test (15%), one presentation (20%) and one final paper (40%)
Course material:
1. Macmillan NA and Creelman CD. (2005). Detection Theory: A User's Guide. 2nd edition. Psychology Press. Available online at:
http://digitus.itk.ppke.hu/~banko/VisionGroup/SignalDetectionTheory.pdf
2. Research articles, see schedule

Course description: This course will introduce you to signal detection theory, a useful framework for analyzing human performance on a variety of tasks. You will learn about the applications of detection theory to questions in perception, attention, memory and decision making, alongside classical experimental paradigms that investigate the same issues. The goal is to develop a clear understanding of how traditional paradigms in cognitive psychology might be enhanced by the signal detection framework.

Learning outcomes: By the end of this course, you will be able to:
1. Differentiate sensitivity from bias and calculate both measures from raw data
2. Identify key paradigms in experimental psychology, including their assumptions and caveats
3. Apply signal detection theory to research questions in psychology
4. Interpret and criticise experimental research in the areas discussed

Course policy: Class will be based around discussion of research articles and presentations, with some lecturing in which I will explain the concepts involved. There will be a few in-class exercises in which you will learn, for example, to compute dprime and bias from sample data. Please be on time to class, try to attend all classes, read all the assigned readings and come prepared for discussion with questions and ideas of your own. Attendance will not be taken, but I will be keeping track of your absences and your participation in class discussion. If you are going to miss class or be late, please let me know in advance via email or in person. If you are absent for more than three lectures, I may recommend your withdrawal from the course. Cellphones and laptops may not be used in class. I maintain the right to modify course content, method of evaluations, or the grade distribution at any point in the semester. You are responsible for keeping track of course content posted on Moodle, and for the readings assigned. This document will be updated routinely with the readings for each week.

Communication: Please email me or meet with me if you have any questions about the course material, or if you are concerned about your progress on the course. I will try to respond to emails within a 48 hour period. Please try to use the office hours where possible, and I will do my best to accommodate you outside these hours if needed.

Academic Integrity: You will be doing a lot of writing during this course. All written assignments must be in your own words. Please refer to AUB Student Code of Conduct: https://www.aub.edu.lb/it/services/students/plagiarism/Pages/home.aspx, in particular section 1.1, which concerns academic misconduct including cheating, plagiarism, in-class disruption, and dishonesty. Please be aware that misconduct is vigorously prosecuted and that AUB has a zero tolerance policy. Evidence of cheating or plagiarism will result in course failure.

Disability: AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a visible or invisible disability (including mental health, chronic or temporary medical conditions),

please inform me immediately so that we can discuss your options. To help establish reasonable accommodations and facilitate a smooth accommodations process, contact the Accessible Education Office (AEO), preferentially in the first few weeks of the semester: accessibility@aub.edu.lb; +961-1-350000, Ext. 3246; West Hall, 314. In all cases, you must provide me with an official AUB letter of accommodation from the AEO.

Course schedule and readings

Sept 4 **Introduction**

Sept 11 **Signal detection basics**
- Macmillan & Creelman, Chapters 1 & 2

Sept 18 **Psychophysical methods**
- Gescheider GA. (1976). Psychophysical Theory. In Psychophysics: method and theory, pp. 39-83. Lawrence Erlbaum Associates
- Cornsweet TN. (1970). "The experiment of Hecht, Shlaer & Pirenne" and "Quantal fluctuations in visual perception". pp. 6-26, 68-89. Academic Press.
- Macmillan and Creelman, Chapter 11 (for reference)

Sept 25 **Perception - awareness and learning 1**
- Azzopardi P and Cowey A. (1998). Blindsight and visual awareness. *Consciousness and Cognition*, 7, 292-311.
- Gold JM, Sekuler AB and Bennett PJ. (2004). Characterizing perceptual learning with external noise. *Cognitive Science*, 28, 167-207.
- Pritchett LM and Murray RF. (2015). Classification images reveal decision variables and strategies in forced choice tasks. *PNAS*, 112(23), 7321-7326.

Oct 2 **Perception - awareness and learning 2**
- Haase SJ and Fisk G. (2001). Confidence in word detection predicts word identification: Implications for an unconscious perception paradigm. *American Journal of Psychology*, 114, 439-468.
- Schoups A, Vogels R, Qian N and Orban G. (2001). Practising orientation identification improves orientation coding in V1 neurons. *Nature*, 412, 549-553.

Oct 9 **Attention and Visual Search**
- Palmer J, Verghese P and Pavel M. (2000). The psychophysics of visual search. *Vision Research*, 40, 1227-1268.
- Eckstein MP. (1998). The lower visual search efficiency for conjunctions is due to noise and not serial attentional processing. *Psychological Science*, 9, 111-118.

Oct 16 **Test**

Oct 23 **Memory**
- Ingram KN, Mickes L and Wixted JT. (2012). Recollection can be weak and familiarity can be strong. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 38, 325-359.

Oct 30 **Memory - Applied**
- Meissner CA, Tredoux CG, Parker JF and MacLin OH. (2005). Eyewitness decisions in simultaneous and sequential lineups: A dual-process signal detection theory analysis. *Memory and Cognition*, 33, 783-792.
- Dobolyi DG and Dodson CS. (2013). Eyewitness confidence in simultaneous and sequential lineups: A criterion shift account for sequential mistaken identification overconfidence. *Journal of Experimental Psychology: Applied*, 19. 345-357.

Nov 6 **Pain and placebo effects**
- Clark WC. (1969). Sensory-decision theory analysis of the placebo effect on the criterion for pain and thermal sensitivity (d'). *Journal of Abnormal Psychology*, 74, 363-371.
- Clark WC and Yang JC. (1974). Acupunctural analgesia? Evaluation by signal detection theory. *Science*, 14, 1096-1098.
- Chapman R, Gehrig JD, Wilson ME, Hayes RL, Bennett GJ, Mayer DJ, McBurney DH, Clark WC, Yang JC and Hall W. (1975). Acupuncture, Pain and Signal Detection Theory. *Science*, 189, 65-68.

Nov 13 **Social cognition**

- Banaji MR and Greenwald AG. (1995). Implicit gender stereotyping in judgements of fame. *Journal of Personality and Social Psychology*, 68, 181-198.
- Park J and Banaji MR. (2000). Mood and heuristics: The influence of happy and sad states on sensitivity and bias in stereotyping. *Journal of Personality and Social Psychology*, 78, 1005-1023.

Nov 20 **Group decision-making**

- Sorkin RD, Hays CJ and West R. (2001). Signal-detection analysis of group decision making. *Psychological Review*, 108, 183-203.
- Juni MZ and Eckstein MP. (2017). The wisdom of crowds for visual search. *PNAS*, 21, E4306-E4315.

Nov 27 **Neural mechanisms**

- Azimian-Faridani N and Wilding EL. (2006). The influence of criterion shifts on electrophysiological correlates of recognition memory. *Journal of Cognitive Neuroscience*, 18, 1075-1086.
-Hill H and Windmann S. (2014). Examining event-related potential (ERP) correlates of decision bias in recognition memory judgments. *PLOS ONE*, 9, e106411.

Dec 4 **Caveats and other considerations**

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