PSYC 51.09: Problem Set 6

Introduction

This problem set is intended to solidify the concepts you learned about in this week's lectures and readings. *After attempting each question on your own*, you are encouraged to work together with your classmates in small groups, consult with ChatGPT or other tools, and/or to post and answer questions on the course's Canvas site.

Please upload your problem set to Canvas (as a Word or PDF file) before the due date. No late submissions will be accepted.

Readings and ungraded questions

Links to the readings and materials referenced below may be found on the course GitHub page.

1. Read Chapter 6 of *Foundations of Human Memory*. What were your thoughts on the reading? **(Ungraded)**

2. Read Chapter 7 of *Foundations of Human Memory*. What were your thoughts on the reading? **(Ungraded)**

3. Read the chapter *Context Reinstatement* (Mann23.pdf). What were your thoughts on the reading? **(Ungraded)**

4. Optionally, read the chapter *The Role of Context in Episodic Memory* in *The Cognitive Neurosciences* (MannEtal15.pdf). What were your thoughts on the reading?

5. *Optional*: submit a multiple-choice question based on the materials covered in this week's lectures, readings, and this problem set. You should calibrate the difficulty so that 60–70% of your classmates answer it correctly on an exam. If your question is chosen and you hit your target, you will receive and extra credit point on that exam. **(Ungraded) (Ungraded)**

Graded questions

1. Suddenly it comes to you in the middle of the night: you've figured out how memory works! You furiously scribble down as many details as you can, before the thoughts are lost forever. You have created...***the SHAM model***.

   The next morning, you look back at your scribbles, and you realize that the SHAM model is actually very similar to another model you've studied in PSYC 51.09– the SAM model. In fact, it's the identical in every way, except for one "small" detail. In the SAM model, the associations between items that occupy the short term memory store at the same time are strengthened. But in the SHAM model, the opposite happens. Specifically, items that occupy the short term memory store at the same time become *less strongly associated*. (Similarly, items in the short term memory store become *less* associated with context, according to the SHAM model.)

   With a sinking feeling, you realize that the SHAM model is going to make some pretty strange predictions about people's free recall behaviors.

   (a) What would the SHAM model predict the *serial position curves* (recall probability by presentation position) will look like for immediate free recall and delayed free recall? Draw two curves (and label which is which). Explain (in 1 paragraph) why you drew the curves the way you did.

   (b) What does the SHAM model predict people's temporal clustering patterns (Fig. 7.4A) will look like (for immediate free recall)? Draw a curve analogous to Fig. 7.4A, and explain (in 1 paragraph) why you drew the curve the way you did.

2. How could you determine whether ChatGPT is a good model of human memory? Describe an experiment you could run, and explain how you would interpret the results. **(2-3 paragraphs)**

3. Bonus (1 point): Actually run the experiment you proposed and analyze the data. Make an argument for or against the hypothesis that ChatGPT is a good model of human memory. **(3ish paragraphs plus figures; also include any data you collect)**