Final paper

- Goal: Gain some experience thinking about:
  - a research question
  - experimental design and variables
- Pick a study from the list (or suggest another)
- Modify it to address a new question
  - Why is the new question interesting to you?
  - How does the method need to differ to address the new question?

Exam 1

- Will cover Chapters 1 and 3 to 6
  - “Basic learning mechanisms” from today will be on Exam 2, not Exam 1
- Format:
  - 32 multiple choice (1 point each)
  - 6 short answer (points vary)

Multiple-choice questions

- 32 total
  - 19 on material discussed in class in book
  - 4 book-only
  - 9 class-only

Multiple-choice questions

- Distribution of class-and-book questions:

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<tr>
<th>Chapter</th>
<th># of questions</th>
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<tr>
<td>1</td>
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Multiple-choice questions

- 4 book-only questions:
  - Reliability vs. validity
  - General function of sympathetic, parasympathetic, and somatic nervous systems
  - Signal detection: Sensitivity vs. response criterion
  - Neural activity as a measure of consciousness (Fig. 6.9)

Multiple-choice questions

- 9 class-only questions:
  - Types of research in MSU psych department
  - Relative size of association areas across species
  - Location of face area
  - How a neuron increases its signal strength
  - Response of retinal ganglion cells to dim, bright, and split illumination (2 questions)
  - Stroop effect
  - Bottom-up factors in selective attention
  - Sensemaking process
Short-answer questions

- 3 questions on Karpicke and Roediger (2008)
  - Know the method and results at the level described in the lecture notes
- Draw a corner of the impossible triangle
- Be able to reconstruct the “toad + stool” example from *Severed Corpus Callosum*
- Be able to label cortical lobes, the primary sensory and motor areas of cortex, and CNS “stick figure” from Sept. 11 class
  - Sensory areas: visual, auditory, somatosensory

Basic learning mechanisms

Will be tested on Exam 2, not Exam 1

Learning

- Organisms have to adapt to their environment
- For all animals, this involves:
  - Habituation and dishabituation
  - Conditioning: classical and instrumental
    - Focus of today’s class
- For people this also involves:
  - Observational learning, skill learning, conceptual learning, ...

Conditioning

- Learning associations from
  - A stimulus to a response (classical/Pavlovian)
  - A response to a stimulus (instrumental/operant)
- Important distinctions:
  - A stimulus is part of the environment
    - Bell ringing, smell of food, ...
  - A response is part of the organism
    - Motor action, a thought or emotion, a physiological change, ...

Classical conditioning

- Unconditioned stimulus (US):
  - A stimulus that elicits a response before learning
  - “Unconditioned” means “before learning”
- Unconditioned response (UR):
  - The response elicited by the US before learning

Classical conditioning

- Conditioned stimulus (CS):
  - Initially neutral (elicits no response)
  - Elicits a response after learning
  - Learning involves repeated pairing of CS and US
  - The organism learns that the CS predicts the US
- Conditioned response (CR):
  - The response elicited by the CS after learning
  - May resemble UR, but may not
Example: Little Albert

- US?
  - Clang
- UR?
  - Cry
- CS?
  - Rat
- CR?
  - Cry

- Here, the UR and CR are the same
- Other furry animals could act as the CS
  - Though maybe not as strongly
  - Stimulus generalization

Example:

- US?
  - Smell/sight of food
- UR?
  - Eat
- CS?
  - Sound of can opener
- CR?
  - Approach the can

Example: Dentist

- US?
  - Needle poke
- UR?
  - Flinch
- CS?
  - Sight of needle
- CR?
  - Hold still, to prevent the flinch

Homeostasis

- Stability in body state maintained through self-regulation
  - Control centers in the brain detect deviations in temperature, glucose levels, etc.
  - Deviations trigger internal adjustments or behaviors that restore the target level
- Basis for the homeostatic model of drug tolerance
  - Which assumes classical conditioning

Homeostatic model

- US:
  - Heroin
- UR:
  - Relaxed state, dry mouth
- CS?
  - Sights and sounds of the context where the user usually uses
- CR?
  - Neural and hormonal responses to maintain homeostasis
  - In absence of drug, produces agitated state, salivation

(“Wetter” and “drier” may be reversed in Fig. 7.15.)