Midterm

- Wed Feb 15, in class
- Read the textbook and lecture notes, especially material covered in both
  - Strong emphasis on critical thinking
    - Analyzing experiments, interpreting data and graphs, and proposing new experiments
Midterm

• Arrive early – you will need the full 50 minutes. This is a critical point. It is a long exam.

• Use a pencil for multiple choice questions
• Use a pen or pencil for short answer

• Spread out. Do not sit next to each other.

• Put away everything except a pencil and a pen. No papers, no pencil cases, no headphones etc. Bring photo ID.

• *****Stop writing when the time is done. If you do not, points will be deducted, in fairness to the other students.*****
Midterm

• Write your name (clearly) on the first page!

• Short answer: 1 question (choose 1 of 2), 25 points, you must choose only 1 question!

• Multiple choice: 15 questions, 2 points each
  – Use the correct side of the Scantron
Midterm

• **Use your time wisely.** ~25 minutes for multiple choice, ~25 minutes for short answer.

• For written answers, think before you write. Make sure you understand the question before you start writing.

• **Short answers should be concise AND complete.** Use only the space provided. No “filler,” please.

• **Write legibly; not too small or too big.**
Academic misconduct

• Will be treated very seriously.

• This includes writing past 1:50 pm, when the exam is over.
Make-up exams

- Only for validated medical reasons
- Must submit documentation ASAP

- Make-ups will be **oral exams** (50 minutes) in the presence of professor & TA
Regrading exams

- Written request for regrades. Need to explain why you think the exam should be regraded.

- I reserve the right to regrade the entire exam (not just a particular question), which means that your grade could go down upon regrading.
Short answer questions

I’ll state a hypothesis, describe a study to test the hypothesis, and give the results of that study. 25 pts each.

• Main conclusions – in relation to the hypothesis (4 pts)

• Explain one strength of the experimental design (5 pts)

• Explain one weakness/limitation of the experimental design (5 pts)

• Describe one other study that has tested the same hypothesis (in the same species). Results consistent? (5 pts)

• Propose one new study to test the same hypothesis in the same species (a study not described in lecture or textbook). Include control groups and predictions. Be creative. (6 pts)
Flank marking is one form of aggressive behavior in hamsters. Ferris et al. (1984) tested the hypothesis that arginine vasopressin (AVP) regulates flank marking in hamsters. In individually housed hamsters, the researchers bilaterally injected saline (0.5 µl) or AVP (1 µg) in saline into the medial preoptic area (a region in the hypothalamus) and measured flank marking immediately afterward for 30 minutes.

- Main conclusions, in relation to hypothesis
- One strength of experimental design
- One weakness of experimental design
- One follow up study to test the same hypothesis in the same species. Include control groups and predictions. Be creative.
Scientists hypothesized that progesterone increases male mouse infanticide. To test this hypothesis, they measured infanticidal behavior in male progesterone receptor knockout (PRKO) mice and control (C57BL/6) mice in the laboratory.

Fig. 1. Frequency of infanticide in mated male mice. Mated C57BL/6 (n = 19) males committed infanticide of their first litters 74% of the time. Instances of infanticide dropped to 58% for second litters (n = 31). Mated PRKO males did not commit infanticide (n = 60).

- Main conclusions, in relation to hypothesis
- One strength of exptl design
- One weakness of exptl design
- One other study that has tested the same hypothesis in the same species
- One follow up study to test the same hypothesis in the same species. Include control groups and predictions. Be creative.
Short answer question 3

• Breuner et al. (1998) tested the hypothesis that corticosterone (CORT), an adrenal steroid hormone released during stress, affects activity.
• White-crowned sparrows were brought into the lab. CORT was dissolved in a solvent, DMSO. Worms were injected with DMSO or DMSO containing CORT (4 µg). These worms were then fed to the sparrows.
• Activity was measured by counting the number of movements in cage (“perch hops”). Activity was measured before and after CORT treatment

![Graph showing activity measurements](image)

- Main conclusions, in relation to hypothesis
- **One strength of exptl design**
- **One weakness of exptl design**
- **One follow up study to test the same hypothesis in the same species. Include control groups and predictions. Be creative.**
Scientists hypothesized that calling in male crickets is regulated by a neural circadian clock. To test this hypothesis, researchers placed each cricket in a small individual enclosure in a lab. Each enclosure was kept at 21°C and was light-tight, had its own light bulb on a timer, a microphone, and insulation to reduce external sounds. Crickets were randomly assigned to either constant light (LL) or 12L:12D (n=10 crickets per group). In the graphs below, each row represents one day, and each mark indicates a call. These graphs show data from one cricket on LL and one cricket on 12L:12D, but the results were similar for other subjects in each condition.

- Main conclusions, in relation to hypothesis
- One strength of exptl design
- One weakness of exptl design
- One other study that has tested the same hypothesis in the same species
- One follow up study to test the same hypothesis in the same species. Include control groups and predictions. Be creative.
Multiple choice 1

1) In the 1950’s, blackcap warblers began to spend the winter in Britain. These birds were:

a. central German birds that had evolved a new migratory pattern.

b. learning a new migration route by watching older birds.

c. British birds that had lost the ability to migrate.

d. in poor condition and unable to migrate to Africa.

e. confused.
5) Although Ken Roeder believed that A1 activity mediated the far bat escape response and A2 activity mediated the near bat escape response, which of the following pieces of evidence suggests that this simple model is incorrect:

a. In playback experiments with recorded calls of bats approaching and then attacking a prey item, A1 but not A2 was activated during the approach phase, both neurons were activated during the start of the bat’s buzz, but only A1 was highly active during the bat’s terminal buzz.

b. Notodontid moths are able to perform both escape behaviors: the far bat escape behavior (negative phonotaxis) and the near bat escape behavior (erratic diving).

c. Noctuid moths are able to perform both escape behaviors: the far bat escape behavior (negative phonotaxis) and the near bat escape behavior (erratic diving).

d. a and c

e. a and b
3) A study tested the effects of an aromatase inhibitor (FAD) on aggressive behavior in male song sparrows. Which of the following conclusions best describes these results?

a. Progesterone increases male aggressive behavior
b. FAD decreases some aggressive behaviors but increases others
c. FAD inhibits enzymes other than aromatase
d. Estrogens increase male aggressive behavior
e. The aromatase enzyme catalyzes the conversion of testosterone to estradiol.
Multiple choice 4

4) In a study examining the effects of severe famine during development on rates of mild mental retardation in 19 year old men, famine did not increase rates of mild mental retardation in men. (“embargo” = famine; “no embargo” = no famine)

Which of the following reasons **might** explain why this study did not see an effect of severe famine during development on mild mental retardation rate?

a. There are no effects of famine on brain development in humans.
b. Famine increases mild mental retardation rate in women (female offspring) only.
c. In the area affected by the famine, the most severely affected children died before age 19.
d. All of the above.
e. a and b only