Bi/CNS/NB 150

Problem Set 6

Due: Tuesday, Dec. 1, at 4:30 pm

Instructions:

1) Drop off in the Bi 150 box outside Baxter 331 or e-mail to the head TA (jcolas).

2) Submit with this cover page.

3) Use a separate sheet of paper for each problem.

4) Type all answers if possible.

5) Use complete, grammatically correct sentences.

6) Include your name and the page number on every page.

7) Note that late problem sets receive a 10% deduction for every day past the due date.

Name:

Time and date submitted:

Total pages (including cover page):

Comments:

Problem 1 grade:

Problem 1 comments:

Problem 2 grade:

Problem 2 comments:

Total grade:
Problem 1 (1.5 points): Learning & Memory (part 2)

Problem 1.A (1.05 points): Modulation

Many different factors can influence memory. For each of the situations below, indicate 1) which type(s) of memory are affected and 2) how these effects are manifested. Be as specific as possible.

1.A.a. Bilateral lesions of the amygdalae

1.A.b. Bilateral lesions of all of temporal cortex except for the hippocampi

1.A.c. Lack of sleep for several nights

1.A.d. Repeating something over and over again

1.A.e. Remembering something

1.A.f. Being very emotionally aroused

1.A.g. Large bilateral lesions of prefrontal cortex

Problem 1.B (0.45 points): Reinforcer devaluation

Certain experiments reveal dissociations among types of learning and memory using reinforcer devaluation in an operant/instrumental-learning paradigm. Briefly explain this kind of experiment. What important dissociation can the experiment demonstrate?
Problem 2 (1.5 points): Emotion

Problem 2.A (0.5 points): Functional neuroanatomy

2.A.a. Shown below are four brain regions commonly implicated in emotion in humans. First, name the cardinal plane shown in each of the four panels. Second, identify each of the four regions highlighted in color. For the top-left panel, the red and green subregions can be considered as one region and do not need to be named separately.

2.A.b. Which of these four regions has the clearest, most direct link with a single basic emotion? What is the emotion in question?
Problem 2.B (1 point): Sham rage

The hypothalamus is known to be involved in triggering emotional responses. However, other structures are also important. The importance of these other structures is evident in the phenomenon of sham rage.

2.B.a. Describe sham rage. Which regions are responsible for it? Which lesions produce it? What kinds of behavior does it entail?

2.B.b. What does sham rage allow us to conclude about the roles of the hypothalamus in expressing emotions? To what extent is the hypothalamus necessary or sufficient for these functions?

2.B.c. What does sham rage allow us to conclude about the roles of the rest of the forebrain (i.e., other than the hypothalamus) in expressing emotions? To what extent is the forebrain necessary or sufficient for these functions?