Psychology 5741 (Neuroscience)
Write-ups for Class

For most of this course, you will be given a data set and will be asked to turn in a short write-up of the data and the analysis. Let us begin to be professionals and consider these write-ups as “mini journal articles” that have Methods, Results, and Discussion sections.

Statistical output should not be appended to write ups, nor is there need to provide extraneous detail (or make up detail) about the methods and statistics performed. Most—but not all—of the problems will be short and lacking in the detail so that we can practice doing a number of problems and not spend an inordinate amount of time on a single problem.

The write-ups are expected to be professional and to conform to a journal style used in neuroscience. (You may pick your own journal style). To save time, graphs, figures, and tables may be “cut” from statistical output and “pasted” into a write-up. The titles of tables and figures, however, along with legends should be akin to those expected in a journal article.

The following provides some general principles for writing up homework, a short example of a problem, and a sample write-up of that problem. In the principles and the sample write-up, sections in brackets denotes issues that may not always pertain to a specific problem, but must be present if such information is given in a problem.

**General Principles:**

**Methods Section:** Write a brief summary of the methods, giving:
1. the nature of the observations [humans, rats, mice, cell cultures; males, females; age; special conditions like psychiatric disorders, transgenic animals, etc.]
2. the types of groups [if there are groups];
3. the sample size(s);
4. experimental manipulation(s), if performed;
5. the dependent variables;
6. any issues about missing data, if relevant;

**Results Section:** Present a data summary for this data set in figure and/or tabular form and write a short (i.e., one paragraph) synopsis of the analysis. Key points to mention (or graph) are:
1. descriptive statistics (sample, size, mean, standard deviation, correlation);
2. the type of statistical test(s), including the degrees of freedom [if relevant] and the $p$ value.
3. the direction of the effect;
4. estimate(s) of effect size(s).

**Discussion Section:** A one or two sentence statement in English with no statistical jargon that describes the salience of the results.
Sample Problem: CREB Inhibitor Data Set

Protein synthesis in certain areas of the brain (notably the hippocampus) appears necessary for memory retention. A research examined the effect of CREB, an RNA transcription factor, on memory by administering a CREB inhibitor to a group of rats and saline to a control group after the rats had been trained to criterion in a conditioned fear paradigm. The dependent variable in this case was the amount of freezing in the conditioned fear situation after administration of the substance. Higher freezing is associated with higher memory retention.

Sample Write-up

Methods:
Rats [specify type, sex, age, etc.] were subjected to a conditioned fear paradigm [specify the nature of the paradigm]. Only those rats who met the criteria for an established conditioned fear response were selected for further study and were randomly assigned to a control condition (N = 9) or the experimental condition (N = 10).

In the experimental condition, rats were administered a CREB inhibitor [mention the type of substance, dose, duration and route of administration]. Controls were administered saline [vehicle, etc.]. After administration, rats were retested in the conditioned fear situation and the amount of freezing [any other dependent variables] was measured.

Results:
Figure 1 depicts the means (plus or minus one standard error) for the control group and the group given the CREB inhibitor. [For figures with error bars, make certain to specify the nature of the bars—standard errors, standard deviations, confidence limits]. Rats administered the CREB inhibitor scored an average of 10.9 units lower than controls, a significant results based on a t test for two independent groups (t = 4.09, df = 17, p < .001). The pooled within group standard deviation was 5.8, giving a standardized effect size of 1.88 standard deviation units.

Discussion:
The CREB inhibitor had a very large effect on the freezing response. It decreased the response by almost 2 standard deviations, the equivalent in human terms of changing the mean IQ of a group from normal into the borderline mentally retarded range.
Figure 1. Means (+/- 1 standard error) freezing for rats previously conditioned to a fear cue but then given either a CREB inhibitor or saline.