**Review of Useful Statistics**

1. **Define the following terms:**
2. Mean:

A quantity having a value intermediate between the values of other quantities, an average. It is found by adding all of the values and dividing by the total number of values.

1. Standard deviation:

A measure used to quantify the amount of variation or dispersion of a set of data values. Low – data points are close to the mean. High – data points are spread over a wider range. It is found by taking the square root of the average of the squared standard deviations of the values from their average values.

1. Standard Error of the Mean (SEM):

Depicts the relationship between the dispersion of individual observations around the population mean (standard deviation) and the dispersion of sample means around the population mean (standard error – equals the standard deviation divided by the square root of the sample size. As sample increases, dispersion of sample mean clusters more closely around the population mean and standard error decreases.)

1. N:

Number in a trail or sample. It is important because larger samples increase the chance of finding a significant difference or identifying trends.

1. P-value:

The probability that, given a statistical model, the statistical summary would be the same as or more extreme than the actual observed results. If the p-value is less than or equal to the chosen significance level, the test suggests the observed data is inconsistent with the null hypothesis so the null hypothesis must be rejected. However, that does not prove that the tested hypothesis is true. It is just a tool for deciding whether or not to reject the null. P<.05 – null rejected, p>.05 – not rejected.

1. Independent variable:

The experimental/predictor variable that is being manipulated in an experiment in order to observe the effect on a dependent variable. “Cause”. Example) Study time and intelligence level

1. Dependent variable:

Response/outcome variable that is being affected by changes in the independent variable. “Effect”. Example) Test score

1. Hypothesis:

A proposed explanation for a phenomenon that is testable on the basis of observing a process that is modeled via a set of random variables. Generally based on previous observations that cannot be explained with the available scientific theories.

1. **Draw an example bar graph with labels to show that heart rate in beats per minute is higher after exercise than in resting control subjects.**

p<.05

* Control: 60± 5 (SEM) vs Exercise 100 ± 7 (SEM) bpm.

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* Significant p value, p<0.05.
* N=15

100

80

60

40

Heart Rate (BPM)

20

Control Subjects

Exercised Subjects