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Data Assignment # 4

Bio-Stats

Below is my part of the outline, the methods section:

Experimental Design:

* Our experiment examined the change in Mean Arterial Blood Pressure (MAP) in college aged men and women.
* Our sample was limited to those enrolled in BIOL-201. This constraint was due to Washington and Lee University's requirement to submit project plans to their “Institutional Review Board for Research with Human Subjects” which would have set our team behind schedule.
* The BIOL-201 class is composed of 3 college-aged men and 6 college-aged women, which were used as the two experimental groups.
  + Due to the expected large increase in blood pressure from our treatment, 17 mmHg, (Obtained from [this paper](https://wlu.primo.exlibrisgroup.com/discovery/fulldisplay?docid=cdi_proquest_miscellaneous_68840387&context=PC&vid=01WLU_INST:01WLU&lang=en&search_scope=MyInst_and_CI&adaptor=Primo%20Central&tab=Everything&query=any,contains,https:%2F%2Fonlinelibrary.wiley.com%2Fdoi%2F10.1111%2Fj.1365-2362.2005.01578.x&mode=Basic), table 2) our limited sample size should still be able to produce statistically significant results.
* Our power analysis was conducted with type I error () set to 0.01 and type II error () set to 0.2, expected effect size d = 103 - 8643. We found n = (Z-Z)d=1.672. Thus, our limited sample size should still be able to produce statistically significant results.
  + One limitation for our power analysis is that we only have the expected increase in MAP due to exercise for men.
* Gender was considered a blocking variable, and our treatment was walking down 5 flights of stairs, to the bottom of Leyburn library, and then jogging back up those stairs to the main floor.
* Using this experimental design to collect data, we are able to explore both the change in Blood Pressure due

What Was Measured:

* Systolic and Diastolic blood pressure of each subject was measured using the Amazon Basics Lovia Digital Blood Pressure Monitor (model #B02).
  + Systolic and Diastolic blood pressure for each subject was converted to Mean Arterial Blood Pressure (MAP) by the formula MAP = Diastolic - (⅓)(Systolic-Diastolic).
* Blood pressure was taken in accordance with the [user’s manual for the Lovia Blood Pressure system.](https://images-na.ssl-images-amazon.com/images/I/911kKv3naKL.pdf) The BP cuff was used on bare skin, with the artery mark about an inch above the elbow pit, with subjects sitting up straight without legs crossed.
* Subjects were also given a roughly 3 minute resting period before initial blood pressure was taken. According to [this study](https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.121.17496), 3 minutes is enough time to wait before measuring Blood Pressure.
* Subjects were also given the following instructions to read, and told not to talk while BP was being measured.

“Today, we will be doing a simple test to measure your blood pressure before and after exercise.

We will first measure your blood pressure now.  Take a minute to relax, and breathe normally.

Once your initial blood pressure has been measured, you will walk all the way to the bottom of the Leyburn stairwell, and back up to our classroom (M47.)

Then, we will measure your blood pressure again.”

* Upon returning from the Leyburn Stair Exercise, subjects were immediately sat down and had their blood pressure taken again. This time, they were not instructed to relax, and did not get any relaxation period. Subjects were still instructed to sit up straight and make sure their legs were uncrossed.

What was compared, and how:

* Differences in MAP before and after the Leyburn Stair Exercise were compared via a T-test, and confidence interval.