# Week 4

Goal: In this assignment, students revisit the island to collect data for a randomized experiment. Students practice randomly allocating participants into two groups, and measure pre and post pain tolerance levels. This data is used in future weeks. Students continue to build their fluency with storing data in excel.

## Part 1

In week 3 we learned about randomized experiments. We'll practice analyzing data from a randomized experiment in Week 5, but we will collect our data this week. We will once more be visiting the Islands in order to asses the effect of stretching on pain tolerance.

STUDY INTRODUCTION

Delayed onset muscle soreness (DOMS) is a well documented phenomenon in which pain is felt in muscles 24 to 72 hours after initial exercise. One strategy to reduce DOMS is further exercise, which is believed to reduce DOMS by increasing pain tolerance thresholds.  There is not yet a clear consensus on other activities that may alleviate DOMS. In this study, we will examine whether stretching may help reduce the effect of DOMS via increasing the pain tolerance threshold, the same mechanism as repeated exercise. The research question we will specifically investigate is does stretching increase pain tolerance threshold?

STUDY DESIGN

Before we collect data, we have to ensure we design our study in a way that will allow us to make a causal inference. Complete the following steps.

(1) Visit the Islands and click on 'contacts' in the upper right. We will use the Islanders we sampled in Week 1 as our sample for this study. (Remember: we selected these residents of Vardo with a form of random sampling called Simple Cluster Sampling.)

(2) Our study will have two groups: an experimental group and a control group. In order to control for the effect of potential confounding variables, we must randomly assign each of our participants into either the experimental group or the control group. Use [this video](https://youtu.be/LrAJfWIS1Y0) as a guide to randomly sort the participants. After randomly sorting participants, assign the first half to the experimental group, and the second half to the control group. Create a new variable in excel called group and enter the correct group for each participant.

Note: If you have an odd number of total participants, that's okay. Randomized experiments don't require you to have even group sizes. Just put one extra person in the experimental group.

Note: Once you've assigned groups via this random allocation, do not alter it in any way. If participants decline participation or are now deceased, leave them in your dataset, but leave their measurements blank. It is okay if you end up with a different number of individuals in each group.

DATA COLLECTION

We want to assess the effect of stretching on pain tolerance. To assess whether stretching can cause changes in pain tolerance, we will be measuring each participant's pressure pain threshold as part of a randomized controlled experiment.

Complete the following steps to conduct your experiment and collect data. You should store your data in a similar manner as this example table:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID | Name | Age | Gender | Group | Pre | Post |
| 1 | Allan Zagreb | 43 | M | Experimental | 144 | 124 |
| 2 | Bethany Yerevan | 47 | F | Control | 152 | 148 |

EXPERIMENTAL GROUP:

(1) Collect the participant's name, age, and gender. (You should already have this information from Week 1.)

(2) Click on 'tasks' then 'physiology' then 'pain pressure threshhold trapezius'. This is the measure we will use for pain tolerance. Collect an initial baseline reading. This is our 'pre' measurement.

(3) Click on 'tasks' then 'exercise' then 'stretching and holding 5 mins'. This is the 'treatment' or 'intervention' we will be examining.

Hint: You will have to wait 5 mins for each participant. Therefore, open 5 tabs, and have 5 participants each stretch at the same time. That way, you can finish all your data collection in three batches of five participants.

(4) After the participant is done stretching, measure the 'pain pressure threshhold trapezius' again. This is our 'post' measurement.

CONTROL GROUP:

(1) Collect the participant's name, age, and gender.  (You should already have this information from Week 1.)

(2) Click on 'tasks' then 'physiology' then 'pain pressure threshhold trapezius'. This is the measure we will use for pain tolerance. Collect an initial baseline reading. This is our 'pre' measurement.

(3) Wait 5 minutes. Do not have the participant complete any tasks.

(4) After 5 minutes are over, measure the 'pain pressure threshhold trapezius' again. This is our 'post' measurement.

DATA PREPARATION

(1) Create a new variable for each participant, the change in their pain tolerance. This will be our main variable of analysis. Calculate this by the following equation: Change = Post.Tolerance - Pre.Tolerance.

Save your data as a .csv file.

**due Sunday**. Submit your csv data file.