Thinking About Observational Data & Making Adjustments for Remote Research

Teacher Supplemental Information:
Observational Research projects are an excellent option for any student that is able to move about independently (or in some cases in a group).

Overall Benefits
1) Low or no cost for set up and supplies, minimal risk involved due to no manipulation being implemented by the student researcher.

2) Activity can be easily scaled up or down in difficulty

3) Identifying and operationalizing variables is an engaging activity for students and offers the opportunity to collect a significant amount of data

4) Some of the key concepts can be used as extensions to the main activity, like taking a deeper dive in validity (looking at internal and external validity) as well as bias (beyond the Hawthorne Effect) and the different types of errors that can impact data collection, measurements, data analysis and interpretation (ie random errors and systematic errors).

5) Creating, contributing to and using a database that can continuously be added to by all students if as a class variable being collected are uniform across the board.

Tip: Make it an individual project!

Benefits
1) Less intrusive, reduces changes in behavior that participants may do if they notice that they are being observed (AKA the Hawthorne Effect)

2) Students who prefer to work independently can take advantage of this research model easily

Challenges
1) Potential for increased error in the data, if multiple people are collecting variables with a specific criteria, internal validity increases.
Tip: Make it a group project!

**Benefit**
1) Increase in internal validity
2) Sharing of ideas and data collection facilitates teamwork and communication.

**Challenge**
1) Coordinating the data collection and communication [which can be overcome by putting in place a few slightly adjusted norms]

**Social Distancing Adjustments**
Having to do research in an environment where social distancing is crucial has its challenges but it does not make research impossible.

Here are some ways that research can happen even when students are not able to be in the classroom with you for in person guidance, or able to work together in groups in the traditional sense.

**Data Collection**
1) In a group project, students can communicate with each other such that they decide who is responsible for what task. An ideal option, depending on what variables are being collected, can be that students collect data individually in separate locations. Having multiple people collecting the data increases the amount of data being collected and also allows potentially more informative results because there are significantly more data points to analyze.

2) Data can be pooled by uploading data into a shared spreadsheet. Spreadsheets in the Google suite are an excellent option.
Observational research is something we do every day, whether we are aware of it or not. But let's start at the beginning. What is **OBSERVATIONAL RESEARCH**?

Observational Research is **correlational research** in which a researcher observes ongoing behaviors with little to no manipulation in the environment.

*This means that participants are naïve and researchers are either hidden or trying to blend in with the general environment.

[include cohort study and case control study]

**Key concepts linked to observational studies are:**
1) **Operational Definition**: A VERY specific definition of a variable that defines it such that it can be measured or identified in a consistent manner.

*Check for understanding questions:*

*Why would we care about having the measurement be consistent?*

2) How will we quantify the results? Thinking about how you intend to analyze the data can play a significant role in what variables are chosen and the kind of measurements you collect.

3) Being purposeful in the variables chosen for measurement and making sure that they can be measured in a reliable manner.

4) The type of measurements done during observations are largely: descriptive data, frequency

*Check for Understanding:*

*Why is this critical?*

*Can you think of an example of a variable that may be difficult to measure?*

*Can you think of a variable that may be easy to measure?*

Let’s look at some examples. For a theme of Corona-virus induced social distancing behaviors and questions can be found below.

**Consumer Behaviors**

1) What kind of products are being consumed (purchased and used) rapidly by people?
2) What kind of products are not being consumed(purchased and used) by people?
3) Have product price changes changed consumer behaviors?

**Outside/Public Behaviors**

1) Have you noticed any differences in walking behaviors on sidewalks or in public spaces? If so, what behaviors have you noticed (identifying these behaviors can be measured through frequency).

- Examples include:
  - Approximate distance between people at a crosswalk
  - Approximate distance between people while walking down a sidewalk
  - Average number of people walking together in groups versus individuals walking
  - Average number of people walking with pets versus people walking without pets

2) Who's wearing a mask? Key data about the individuals can be collected including variables like:

- Approximate age
- Location (neighborhood, zipcode)
- Correct positioning of mask
- Type of mask
- Observed sex/gender

3) Who's wearing gloves?

- Number of people wearing gloves while walking?
- Does the number of people wearing gloves vary at different times of the day?
- Does any demographic variable (approximate age, observed sex/gender, race) impact who is wearing gloves?
- Are there children wearing gloves?

**What Should I Do Now?**

1) Decide whether you will be working as an individual or in a group.

   *If you are working in a group now is the time to exchange contact information and establish a plan around how you all will communicate with each other (using what communication platform; ie Zoom, Google Chat, telephone, etc), how frequently, what time of day and how the work will be shared and viewable by all group members.

2) Decide on a research question that’s interesting to everyone. Discuss with your teacher to get feedback on whether this question is a **TESTABLE QUESTION**.

3) Identify variables that can be collected and that are **MEASURABLE**.
4) Operationalize those variables so that everyone involved in the data collection understands what the variable is, what the criteria are that the data must meet in order to qualify as the variable that you are measuring, and what the unit of measurement is.

5) Create and organize a spreadsheet that all members of the group can access. (Google suite is an excellent option)

6) If the same variables are being collected by multiple people, be sure to decide on and collect data for a UNIQUE IDENTIFIER (of the SAME VARIABLE TYPE) that is linked to where or how the data was collected. This helps you keep track of what individual data point was collected where or by whom in the event that the need arises to go back to the raw data for any reason. An example of this is having each person in the group be sure to note the zipcode of where they are collecting data.

7) Create a DATASHEET where when you are out in the field collecting data you have a place to record the information you observe.

8) Collect data! [safely, ethically, consistently and enthusiastically]

Resources
https://www.iwh.on.ca/what-researchers-mean-by/observational-vs-experimental-studies
https://measuringu.com/observation-role/