Control Problems

Tyson S. Barrett, PhD

PSY 3500

What do we mean by control?

Ceteris Paribus – “All others things being equal”

To talk about causality:

All other conditions that could impact the results must be equal across groups and scales

This chapter talks about problems associated with trying to make the results “Ceteris Paribus”

Correlated IVs & Chicken or Egg?

When different independent variables are correlated, can we truly get a Ceteris Paribus result?

How do we tease apart the effects of various factors when they are related to each other?

When we do not measure these factors, they become possible confounders

In quasi-experimental designs, it can be difficult to tell which variable causes the other

- **Does homelessness cause drug use or does drug use cause homelessness?**

Some solutions

Creating an environment for Ceteris Paribus

Splitting designs

Checkerboard random assignment across potentially important factors – which are important factors?

Increase Sample Size

The higher the sample size, the more precision our estimates will be – does not erase bias

Matching

For each subject in the treatment group, there is at least one match in the control – what variables should be matched on?

Longitudinal Designs

Measure IVs and DVs at many time points

What this means for you

Method Section

Some of these problems could apply to your study

- Discuss at least one solution to these problems
- There could be other problems (e.g., data collection issues)

Keep in mind that each measure can be impacted differently from each problem

- Sometimes several fixes are needed for a single problem

Final Thoughts on Causality

Causal effects are usually what we seek

Counterfactual Theories

Comparing what happened in one condition with what *would have* happened in another
Is this possible?

Necessary and Sufficient Causes

If x is a necessary cause of y, then the presence of y necessarily implies the prior occurrence of x. The presence of x, however, does not imply that y will occur.

If x is a sufficient cause of y, then the presence of x necessarily implies the subsequent occurrence of y. However, another cause z may alternatively cause y. Thus the presence of y does not imply the prior occurrence of x.