ESP 178 Applied Research Methods

2/7 Class Exercise: Experiments

Introduction

Experiments are an effective way of testing for causality, because they let the researcher control everything but the independent variable. True experiments aren’t generally feasible or appropriate for the kinds of questions we study in environmental policy. But quasi-experimental designs often are. These studies generally fall into two categories – “intervention” studies and “natural experiments.” In intervention studies, the researcher intervenes in some way with the goal of changing behavior; the intervention often takes the form of an educational program or an incentive program. If the study shows that the intervention is effective in changing behavior, then it might be implemented more widely. In natural experiments, the researcher studies the effect on behavior of some change or event that she does not control and thus takes advantage of a naturally occurring experiment. If the change or event is something that someone controls (e.g. not an earthquake), then the study can be used to argue for more or less of that change or event. The same techniques can be used for “program evaluation,” to evaluate the effectiveness of a program in bringing about the desired change.

Questions

1. For our study of biking in Davis, let’s see if we can design an intervention study that qualifies as a true experiment. Use levels of biking as the dependent variable. The goal of the intervention is to increase levels of biking.

   a. Develop an intervention that you could test in the experiment. The intervention has to be something that you control and that you think will have an impact on individual levels of biking for a specific population. Start by thinking back to your conceptual model from earlier exercises – what factors do you think impact levels of biking? Which of these factors can you, the researcher, change?

   b. How would you recruit participants from the target population? How would you assign them to the experimental group and the control group?

   c. What measurements will you need to make? When will you make these measurements (relative to the treatment)? How will you make these measurements (e.g. survey, observation)?
d. Check your experiment for internal validity. Try to come up with at least one possible problem that might lead to each of the following...

- Selection bias (characteristics of experimental and control groups differ)?

- Endogenous change (subjects change during experiment independent of treatment)?

- History effects (something else occurs during the experiment)?

- Contamination (groups are aware of each other and influenced as a result)?

- Treatment misidentification (change occurs through process not identified by researcher)?

e. What are possible ethical issues associated with your experiment?

2. A few years ago the city opened a new bike tunnel under I-80 and the railroad tracks. If you had been a planner with the city at the time, you would have thought to yourself, “Hey, that’s a natural experiment!” and set out to study the effects of the tunnel.

a. What’s your dependent variable – the behavior you expect to see change as a result of the tunnel?

b. Who is the treatment group?

c. Who could you pick as a control group?

d. What measurements would you want to make and how would you make them?

e. Does this count as a quasi-experimental study?

Midterm Tuesday!
Next Thursday: Chapter 8 Survey Research