

Define the theoretical and accessible population for the problem assigned to you. Explain how you would go about constructing a sampling frame and how you would select the sample and how individuals will be assigned to treatment and control groups. Describe the design that you would use, including the treatments that you would implement and the control or comparison that you would use. Describe the pre and post measures that you will use. If you decide that you must use a quasi-experiment, explain why it would be difficult (or unethical or not recommendable) to try to use a true experiment instead of a quasi-experiment to answer the question. Discuss the weaknesses in your design.

### **Problem 1**

The objective of the study was to determine whether computer-assisted tutoring is an effective way to enhance math skills. The Normalville School District has agreed to collaborate. There are 15 fifth-grade classes in the School District. All students will take the Standard Math Skills Test before assignment to treatment and control groups. The maximum possible score on this test is 150 and a score of 0 is possible. Students were randomly assigned to a treatment (access to computer assisted tutoring) and control (no access) groups. After six weeks, all subjects will take the Standard Math Skills Test again.

### **Problem 2**

Your objective is to compare the efficacy of the peer court system and the traditional juvenile court system in preventing recidivism among youth who commit crimes. You have the cooperation of the appropriate Dade county authorities, where a peer court system is currently being implemented. The Dade County authorities determine which offenders are assigned to the traditional system versus the peer system, based on, among other things, the seriousness of the offense and the history of the individual. Peer court is open only to youth without previous offenses and only to youth who commit misdemeanors. The peer court process involves a community service element. The traditional system uses a variety of punitive measures, ranging from incarceration to community service. You will evaluate recidivism at 6, 12 and 18 months after completion of the sentence. Design a quasi-experiment to answer this question.

### **Problem 2**

How can we get Americans to reduce energy consumption in the home? Many ways of getting Americans to reduce energy use in the home have been suggested. Some say consumer education is the answer. Others argue that people really pay attention to the pocket book and suggest that incentives like one-time payments for installing insulation or a several year discount on energy bills for installing energy efficient air-conditioners is the answer. You have a grant with a large budget that will extend over the next five years. You will conduct your study in Pinellas County where you have the complete collaboration of the local utility company (TECO). Your objective is to determine which of the different approaches works best. (Hint: don't forget a control!)

### **Problem 3**

The objective of the study is to determine whether visits to courtroom trials enhance students' understanding of the role and functions of the trial in the American justice system. The Normalville School District has agreed to participate in your study. Students will be assigned to one of four groups:

- A. Treatment with pre-test
- B. Treatment without pre-test
- C. Control with pre-test
- D. Control without pre-test

The pre-test consists of a standardized test for seventh grade students that evaluates knowledge

about the role and functions of the trial. The maximum possible score on this test is 50 and a score of 0 is possible. The treatment consists of an enhancement to the standard classroom instruction offered to the control groups. The enhancement is to spend one-half day in a courtroom with an instructor present to answer questions and explain what was happening. At the end of the week spent on “the trial in the American justice system,” all subjects will take the standardized test.

#### **Problem 4**

Selva Verde is a research station in Brazil. It is situated in one of the largest remaining patches of tropical rainforest. Once visited almost exclusively by researchers, improved access has made the station a tourist attraction as well, primarily for nature or eco-tourists. To reduce the demand on the time of station staff, enhance the economic impact of the station on the local community, and increase the value of the intact rainforest to local inhabitants, the station has trained 12 tour guides. These are local people. They have been given instruction about the biology and ecology of the rainforest and taught to find and identify organisms of interest to eco-tourists, such as birds. Tourists to the station may elect for one of three options: (1) a self-guided tour (map and some limited written material) at a cost of \$5; (2) a two-hour guided tour at a cost of \$15 and (3) a halfday (about 4.5 hours) guided tour that includes a canoe trip at a cost of \$25. You want to know whether the three different experiences differ in terms of how they affect tourists’ knowledge about and appreciation of the tropical rainforest. Design a study to answer this question.

#### **Problem 4**

Adolescent obesity is a serious and growing problem in the United States. You have a large grant to conduct an experiment to determine whether participation in a peer group involved in a planned weight reduction program that includes nutrition education, weight monitoring and regular exercise would be an effective to reduce obesity among adolescents. The grant provides funding for three years. You have the collaboration of Shands Hospital for this study. Shands runs a clinic for obese adolescents. The patients in the clinic are referred to the clinic when obesity is diagnosed as putting the youth at immediate risk of serious health problems (e.g., diabetes, cardio-vascular illness, etc.). The youth currently receive nutrition education and staff at the clinic work individually with youth to try to improve diet and increase exercise. The existing program runs for six weeks and participation is voluntary, based on permission of the youth’s parents. Design a study to determine which approach works best. Hint: Don’t forget the persistent versus short-term effect issue.

#### **Problem 5**

The objective of the study is to determine whether the attitude of male voters about negative political ads are influenced by the gender of the candidate who makes the ad. A random sample of 25-50 year old registered male voters was selected in Normalville, USA. Subjects will be assigned to one of four groups:

- Group 1 Female politician, mildly negative ads
- Group 2 Female politician, strongly negative ads
- Group 3 Male politician, mildly negative ads
- Group 4 Male politician, strongly negative ads

Each test subject will see three television ads of the same type; e.g., a subject in group 1 will see three mildly negative ads by a female politician against her opponents. A 25-item Likert scale (highly dependable, well tested, etc.) will be used to determine the subjects’ attitudes about the **politician who made the ads**. The statements on the Likert scale were like these. “This politician is very strident.” “This politician is too critical.” “This politician states his/her position firmly.”

### **Problem 6**

The objective of this study is to determine the effect that watching violent cartoons on TV has on the aggressiveness that 4-7 year-olds display during play. A random sample of 4-7 year-olds will be selected from those who participate in after-school enrichment programs in the Normalville School District. Subject will be assigned to treatment (watch 1 hour of violent cartoons) and control (watch 1 hour of non-violent cartoons) groups. Subjects will be observed for 45 minutes of play after the intervention. Three trained observers will rate each subject's behavior using the following scores:

- 1 not aggressive
- 2 somewhat aggressive
- 3 moderately aggressive
- 4 aggressive
- 5 very aggressive.

The scores reported by the three observers will be averaged to assign a composite score to each subject; e.g., if a subject received scores of 2 (Observer 1), 2 (Observer 2) and 3 (Observer 3), the subject will be assigned an aggressiveness score of 2.3.

### **Problem 7**

The objective of this study is to determine the effect that contextual environmental education has on appreciation of eco-tourism sites. A random sample of tourists who pay for a guided tour of the La Selva Tropical Rainforest Reserve in Costa Rica will be selected. Subjects will be assigned to one of three groups, depending on how much information about the rainforest will be provided to them by their guide:

- Group 1 Very Little Information
- Group 2 Moderate Information
- Group 3 High Information

After completing the guided tour, each subject will complete a questionnaire. It consists of 10 questions that evaluate the subject's appreciation of the rainforest. They consist of questions like these. "How likely would you be to recommend that someone else visit La Selva?" "How important do you think it is to maintain this preserve in its natural state for future generations?" All responses were scalar ranging from 1 (very negative) to 5 (very positive). The responses for each subject will be summed to give an overall "appreciation rating;" e.g., an individual who responded 3, 4, 2, 3, 4, 3, 2, 1, 2, 3 will receive a rating of 27.

### **Problem 8**

The objective of this study is to determine whether knowing that food is organically produced affects people's perceptions of the taste of the food. A sample of 25-50 year-olds in Normalville, USA, is needed. Subjects will be asked to compare the taste of the strawberries in two bowls. They will then indicate which, in their opinion, tastes better. Subjects will be assigned to one of three experimental groups:

- Group 1 No labels
- Group 2 Organic and conventional correctly labeled
- Group 3 Organic and conventional reverse labeled

**Problem 9**

The objective of this study is to determine whether direct experience with individuals suffering severe illness due to obesity affects an individual's propensity to lose weight. Several local general practice physicians have agreed to help recruit a sample of their patients that they have diagnosed as clinically obese. All subjects will be randomly assigned to one of four treatment groups:

Group 1 Standard lecture about the health hazards of obesity

Group 2 Graphic film about the health hazards of obesity

Group 3 Personal visit with patients suffering from obesity-induced serious disease

Group 4 Observation of surgical procedures in the hospital on patients suffering from obesity-induced serious disease

The weight of each subject will be measured every two weeks for four months following the intervention.

**Problem 10**

The purpose of this study is to determine which of four approaches to environmental education produces the greatest gain in knowledge among visitors to eco-tourism sites. A random sample of visitors to Barro Colorado Park will be selected. All subjects will complete a test that evaluates knowledge about the park's tropical ecosystem prior to touring the site. Test scores can range from 0 to 50. Subjects will be assigned to one of four groups:

Group 1 Subjects rely on interpretive signs in park

Group 2 Subjects view 30 minute film about park prior to tour

Group 3 High quality written educational materials provided to carry with them

Group 3 Trained guide accompanies the group and provides information orally

After completing the tour, all subjects will complete the test again.

**Problem 11**

The purpose of this study is to determine how the source of information about farming influences farmers' perception of the value of the information. A sample of 25-50 year old male farmers is needed. Subjects will be given a fact sheet about three topics: (1) using beneficial insect in pest management, (2) the use of organic soil amendments and (3) cultural control of plant pathogens. All of these fact sheets were identical in content. All information is taken directly from science-based studies conducted at major land grant universities. The fact sheets differ, however, in terms of the purported publisher of the information. Subjects will be assigned to one of three groups as follows.

Group 1 Beneficial insects labeled university

Organic amendments labeled commercial company

Cultural control labeled organic association

Group 2 Beneficial insects labeled commercial company

Organic amendments labeled organic association

Cultural control labeled university

Group 3 Beneficial insects labeled organic association

Organic amendments labeled university

Cultural control labeled commercial company

After reading each fact sheet, each subject will be asked to evaluate the value of the information provided. Very well tested Likert scales will be used (you can treat this as interval data).