## Key Terms

Response variable: variable that measures an outcome or result of study.

Explanatory variable: variable that we think explains or causes changes in the response variable.

Individuals studied in an experiment are often called subjects

A treatment is any specific experimental condition applied to the subjects. If an experiment has several explanatory variables, a treatment is a combination of specific values for these variables.

Lurking Variable: variable that has an important effect on the relationship among the variables in the study but is not one of the explanatory variables studied

Two variables are confounded when their effects on a response variable cannot be distinguished from each other.

the confounded variables may be either explanatory or lurking variables.

## Chapter 6 Key Terms

double blind experiment: neither the subject nor the people who work with them know which treatment the subject is receiving

clinical trials: medical experiments involving human subjects.

nonadherers: subjects who participate but don't follow experimental treatment

experiments that continue over an extended period of time also suffer dropouts: subjects to begin the experiment but do not complete it.

If a subject drops out because of their reaction to one of the treatments, bias can occur.

a well designed experiment tells us that changes in the explanatory variable must cause changes in the response variable.

make sure that your findings are statistically significant, that they are too strong to occur by chance.

## Chapter 6 Key Terms (cont)

Completely Randomized Design (experimental design): all the experimental subjects are allocated at random among all the treatments.

Matched Pairs Design (matching and randomization): compares just two treatments

choose a pair of subjects that are as closely matched as possible. Assign one of the treatments to each subject by random assignment.

Block design: group of experimental subjects that are known before an experiment to be similar in some way that is expected to affect the response of the treatments

random assignment of subjects to treatments is carried out separately within each block.

combines the idea of creating equivalent treatment groups.

another form of control. Some outside variables are controlled by bringing those variables into the experiment to form the blocks.

## Chapter 5

placebo effect: dummy treatment with no active ingredients.

Randomized Comparative Experiment: one that compares two treatments.

random assignment into groups, one group for each treatment

make sure to include one control group.

## Chapter 7

The organization that carries out the study must have an institutional review board that reviews all planned studies in advance in order to protect the subjects from possible harm.

purpose:to protect the rights and welfare of human subjects recruited to participate in research activities.

## Chapter 7 (cont)

All individuals who are subjects in a study must give their informed consent before data is collected.

must be informed about the nature of the study and risk.

All individual data must be kept confidential. Only statistical summaries for groups of subjects may be made public.

Anonymity: subjects are anonymous - their names are not known even to the director of the study.

Confidentiality:

## Logic of Experimental Design

Randomization produces group of subjects that should be similar in all respects before we apply the treatments.

Comparative design ensures that influences other than the experimental treatments operate equally on all groups.

Therefore, differences in the response variable must be due to the effects of treatments

Principles of Experimental Design

1. Control. The effects of lurking variables on the response, most simply by comparing two or more treatments

2. Randomize. Use impersonal chance to assign subjects to treatments.

3. Use enough subjects in each group to reduce chance variation in the results.

Statistical Significance: an observed effect of a size that would rarely occur by chance

Good studies are comparative even when they are not experiments.

We can often combine comparison with matching in creating a control group

note: matching does not entirely eliminate confounding

A good comparative study measures and adjusts for confounding variables.

## Clinical Trials

Clinical Trials: experiments that study the effectiveness of medical treatments on actual patients.

Randomized comparative experiments are the only way to see the true effects of these new treatments. Without them, risky treatments that are no better than placebos will become common

Clinical trials produce great benefits, but most of these go to future patients. The trials pose risks which are borne by the subjects. Balance future benefits against risks

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Both medical ethics and international human rights standards say that the interest of the subject must always prevail over the interests of science and society.

Behavioral and Social Science experiments

the direct risks to experimental subjects are less acute, but so are the possible benefits.

invasion of privacy, informed consent are both issues in these studies