

## Chapter 11:

**1. Steroids** The 1990s and early 2000s could be considered the steroids era in Major League Baseball, as many players have admitted to using the drug to increase performance on the field. If a sports writer wanted to compare home run totals from the steroids era to an earlier decade, say the 1960s, explain why this would be an observational study. Could the writer conclude that it was the steroids that caused the increase in home runs? Why or why not?

**15. Standardized test scores** For his Statistics class experiment, researcher J. Gilbert decided to study how parents' income affects children's performance on standardized tests like the SAT. He proposed to collect information from a random sample of test takers and examine the relationship between parental income and SAT score.

a) Is this an experiment? If not, what kind of study is it?

b) If there is a relationship between parental income and SAT score, why can't we conclude that differences in score are caused by differences in parental income?

**27.** In 2002, the journal *Science* reported that a study of women in Finland indicated that having sons shortened the life spans of mothers by about 34 weeks per son, but that daughters helped to lengthen the mothers' lives. The data came from church records from the period 1640 to 1870. Identify:

a) whether it was an observational study or an experiment.

*If it was an observational study, identify (if possible)*

b) whether it was retrospective or prospective.

c) the subjects studied and how they were selected.

d) the parameter of interest.

e) the nature and scope of the conclusion the study can reach.

*If it was an experiment, identify (if possible)*

b) the subjects studied.

c) the factor(s) in the experiment and the number of levels for each.

d) the number of treatments.

e) the response variable measured.

f) the design (completely randomized, blocked, or matched).

g) whether it was blind (or double-blind).

h) the nature and scope of the conclusion the experiment can reach.

**59. Safety switch** An industrial machine requires an emergency shutoff switch that must be designed so that it can be easily operated with either hand. Design an experiment to find out whether workers will be able to deactivate the machine as quickly with their left hands as with their right hands. Be sure to explain the role of randomization in your design.