

- 14. Fish.** The U.S. Fish and Wildlife Service plans to study the kinds of fish being taken out of Saginaw Bay. To do that, they decide to randomly select 5 fishing boats at the end of a randomly chosen fishing day and to count the numbers and types of all the fish on those boats.
- What kind of design have they used?
  - What could go wrong with the design that they have proposed?
- 16. Playground.** Some people have been complaining that the children's playground at a municipal park is too small and is in need of repair. Managers of the park decide to survey city residents to see if they believe the playground should be rebuilt. They hand out questionnaires to parents who bring children to the park. Describe possible biases in this sample.
- 21. Survey questions.** Examine each of the following questions for possible bias. If you think the question is biased, indicate how and propose a better question.
- Should companies that pollute the environment be compelled to pay the costs of cleanup?
  - Given that 18-year-olds are old enough to vote and to serve in the military, is it fair to set the drinking age at 21?
- 22. More survey questions.** Examine each of the following questions for possible bias. If you think the question is biased, indicate how and propose a better question.
- Do you think high-school students should be required to wear uniforms?
  - Given humanity's great tradition of exploration, do you favor continued funding for space flights?

1–20. What's the design? Read each brief report of statistical research, and identify:

- whether it was an observational study or an experiment.

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

- whether it was retrospective or prospective.
- the subjects studied, and how they were selected.
- the parameter of interest.
- the nature and scope of the conclusion the study can reach.

If it was an experiment, identify (if possible)

- the subjects studied.
- the factor(s) in the experiment, and the number of levels for each.
- the number of treatments.
- the response variable measured.
- the design (completely randomized, blocked, or matched).
- whether it was blind (or double-blind).
- the nature and scope of the conclusion the experiment can reach.

- Over a 4-month period, among 30 people with bipolar disorder, patients who were given a high dose (10 g/day) of omega-3 fats from fish oil improved more than those given a placebo. (*Archives of General Psychiatry* 56 [1999]: 407)
- An examination of the medical records of more than 360,000 Swedish men showed that those who were overweight or who had high blood pressure had a higher risk of kidney cancer. (*New England Journal of Medicine* 343 [2000]: 1305)
- Is diet or exercise effective in combating insomnia? Some believe that cutting out desserts can help alleviate the problem, while others recommend exercise. Forty volunteers suffering from insomnia agreed to participate in a month-long test. Half were randomly assigned to a special no-desserts diet; the others continued desserts as usual. Half of the people in each of these groups were randomly assigned to an exercise program, while the others did not exercise. Those who ate no desserts and engaged in exercise showed the most improvement.
- The May 4, 2000, issue of *Science News* reported that, contrary to popular belief, depressed individuals cry no more often in response to sad situations than nondepressed people. Researchers studied 23 men and 48 women with major depression, and 9 men and 24 women with no depression. They showed the subjects a sad film about a boy whose father has died, noting whether or not the subjects cried. Women cried more often than men, but there were no significant differences between the depressed and nondepressed groups.
- Scientists at a major pharmaceutical firm investigated the effectiveness of an herbal compound to treat the common cold. They exposed each subject to a cold virus, then gave him or her either the herbal compound or a sugar solution known to have no effect on colds. Several days later they assessed the patient's condition, using a cold severity scale ranging 0 to 5. They found no evidence of benefits associated with the compound.



SOLUTIONS TO THE ODD#s  
(from the back of the book)

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21. a) Biased toward yes because of "pollute." "Should companies be responsible for any costs of environmental clean-up?"  
b) Biased towards no because of "old enough to serve in the military." "Do you think the drinking age should be lowered from 21?"

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1. a) Experiment.  
b) Bipolar disorder patients.  
c) Omega-3 fats from fish oil, two levels.  
d) 2 treatments.  
e) Improvement (fewer symptoms?).  
f) Design not specified.  
g) Blind (due to placebo), unknown if double-blind.  
h) Individuals with bipolar disease improve with high-dose omega-3 fats from fish oil.
5. a) Observational study.  
b) Retrospective.  
c) Swedish men, unknown selection process.  
d) Risk of kidney cancer.  
e) As there is no random assignment, there is no way to know that the overweight or high blood pressure caused the higher risk for kidney cancer.
13. a) Observational.  
b) Prospective.  
c) People with or without depression, unknown selection process.  
d) Frequency of crying in response to sad situations.  
e) There is no apparent difference in crying response (to sad movies) for depressed and nondepressed groups.