EXPERIMENTS An experiment is often conducted with two groups. One group, called the **experimental group**, undergoes some procedure or treatment. The other group, called the **control group**, does not undergo the procedure or treatment.

In a well-designed experiment, everything else about the experimental group and the control group is as similar as possible so that the effect of the procedure or treatment can be determined.

EXAMPLE 2 Identify flaws in an experiment

RESEARCH A drug company conducts an experiment to test whether a new pain relief medication is effective at relieving headaches. The experimental group consists of college students who are given the medication. The control group consists of college professors who are not given the medication.

The company finds that the headaches of people in the experimental group are of shorter duration than those of people in the control group. As a result, the company concludes that the medication is effective. Identify any flaws in this experiment, and describe how they can be corrected.

Solution

On average, college students are likely to be younger than college professors. So, it could be age rather than the medication that explains why the experimental group had shorter-lasting headaches than the control group.

To correct this flaw, the drug company could redesign the experiment so that the ages of the people in the experimental group are similar to the ages of the people in the control group.

PRACTICE

EXAMPLE 1 on p. 772 for Exs. 1–6

In Exercises 1–6, tell why the question may be biased. *Describe* how to correct the flaw.

1. "Do you agree that building a beautiful new baseball stadium would be a good investment for the city to make?"
2. "A survey of the voters in this state shows that 85% favor a tax cut. Do you favor a tax cut?"
3. A dentist asks her patients, "Do you floss every day?"
4. "Don't you think that renovating the old town hall would be a mistake?"
5. "Do you think the defendant in the Carter case was given a fair trial?"
6. "Which city council candidate's platform do you support?"

EXAMPLE 2 on p. 773 for Ex. 7

7. **EDUCATION** A research company conducts an experiment to test whether a new mathematics software program will increase test scores of students. The experimental group consists of students enrolled in Algebra 2 who are given the software. The control group consists of students enrolled in Algebra 1 who are not given the software.

   The company finds that the students in the experimental group test higher than the students in the control group and concludes that the software is effective at increasing test scores. Identify any flaws in the experiment, and describe how they can be corrected.