Sample Experiment

Dr. Jackson is making observations at Davisville High School to investigate the rate of smoking among American teenagers. Dr. Jackson decides she will observe students having their lunch in the parking lot where smoking is permitted. Dr. Jackson observes 25 out of 30 students smoking in the parking lot. Based on her observations she records that 83.3% of American teenagers smoke.

1. **How is the experiment biased? Use evidence to support your answer.**

2. **What are the effects of the bias on the results?**

3. **What could the scientist do to reduce bias?**

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Experiment A

Dr. Cloud is conducting interviews of Davisville and Springville High School students to determine the rate of smoking among American teenagers. Dr. Cloud gets a list of all the students from each high school and randomly selects 50 students from each school. An appointment for the interview is scheduled with each student and their parents. Each student is interviewed with their parents in the room. The students are asked questions such as, “Do you smoke regularly?”, “Have you ever smoked?”, and “What percentage of your friends smoke?” After finishing the interviews Dr. Cloud concludes that only 1% of American teenagers smoke regularly and 18% of teenagers have tried smoking.

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Experiment B

Dr. Garcia is using both observations and interviews to investigate the rate of smoking among American teenagers. She first selected three study sites: one urban, one rural, and one suburban. Dr. Garcia went to two popular teenage hangouts in each study site and made observations of the teenage students standing around the buildings. She observed a total of 117 students and of those 33 were smoking (28%). Dr. Garcia then went to one high school in each study site and interviewed 25 students from each school. The principal of each school selected the 25 students that would be interviewed for Dr. Garcia's study. Of the 75 total students only 3 said that they smoked regularly (4%). Taking the average percentage from her observations and interviews, Dr. Garcia concluded approximately 16% of American teenagers smoke.

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Experiment C

Dr. Nandi is using confidential interviews to estimate the rate of smoking among American teenagers. She contacted principals at three high schools (rural, urban,
and suburban) and asked for entire lists of their student body. After randomly selecting 50 students from each school she gave permission slips and confidentiality forms to each student so that the students' parents would know that their child was participating in the study and they, as parents, would not have access to the file on their own child. Roughly 35 students from each school returned the permission slips and confidentiality forms. Students were asked fifteen questions about their experiences with smoking. Dr. Nandi found that 53% of the high school students had tried smoking and 25% of high school students smoke a half pack of cigarettes or more a day.

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Experiment D

Dr. Wellstone is using a shadowing method to study rates of smoking among American high school students. First, Dr. Wellstone hired 50 college freshmen and sophomores making certain that the hired students blended in well with the high school students being sampled. He received a list of students attending Davisville and Springville high schools and randomly selected 25 students from each school. Each college student Dr. Wellstone hired shadowed one of the randomly selected high school students from 3 pm to 5 pm and the college students attended Thursday, Friday, and Saturday night parties for two consecutive weeks. The hired college students recorded whether or not their study subject smoked and, if so, how often. Dr. Wellstone concluded that 28% of American teenagers smoke regularly and 44% will smoke at weekend parties only.

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