1. The Sith Lords are concerned that their recruiting slogan, "Give In to Your Anger," isn't very effective. Darth Vader develops an alternative slogan, "Together We Can Rule the Galaxy." They compare the slogans on two groups of 50 captured droids each. In one group, Emperor Palpatine delivers the "Anger" slogan. In the other, Darth Vader presents the "Together" slogan. 20 droids convert to the Dark Side after hearing Palpatine's slogan, while only 5 droids convert after hearing Vader's. The Sith's data scientist concludes that "Anger" is a more effective slogan and should continue to be used.

**Answer:**

To begin with, the experiment is run on captured droids, which we can logically assume are angry. In business, this is addressing customer needs and is likely a cause of the 20% converting. The 5% who converted because of Darth Vader’s slogan may have conceptualized themselves working with the ruling side of the galaxy.

To correct this, The Sith must test both slogans with uncaptured droids.

1. In the past, the Jedi have had difficulty with public relations. They send two envoys, Jar Jar Binks and Mace Windu, to four friendly and four unfriendly planets respectively, with the goal of promoting favorable feelings toward the Jedi. Upon their return, the envoys learn that Jar Jar was much more effective than Windu: Over 75% of the people surveyed said their attitudes had become more favorable after speaking with Jar Jar, while only 65% said their attitudes had become more favorable after speaking with Windu. This makes Windu angry, because he is sure that he had a better success rate than Jar Jar on every planet. The Jedi choose Jar Jar to be their representative in the future.

**Answer:**

This may be a case of Simpson’s paradox *and/or* observer bias. If the outcome of choosing a representative was known to the envoys, Jar Jar may have had bias toward the favorable outcome of becoming a representative. This leads us to a lurking variable, which is how much time Jar Jar spent in friendly planets vs unfriendly planets. Maybe Jar Jar made false promises or included information that Windu did not include, which may have led to these percentages leaning towards Jar Jar.

To correct this, envoys should be using the same general script to talk to the Jedi. After unifying the message relayed, we would really know whether Jar Jar is a better leader than Windu.

1. A company with work sites in five different countries has sent you data on employee satisfaction rates for workers in Human Resources and workers in Information Technology. Most HR workers are concentrated in three of the countries, while IT workers are equally distributed across worksites. The company requests a report on satisfaction for each job type. You calculate average job satisfaction for HR and for IT and present the report.

**Answer:**

Clearly, the report did not correctly account for HR employees in the other two countries. The three countries in which HR employees work may have better regulation for employees than the remaining two, in which IT workers may not be very satisfied. This leads to a synthetic increase in average satisfaction, caused by additional HR satisfaction trumping the lower satisfaction of IT workers in the remaining two countries.

To fix this, we can either analyze the satisfaction of employees of both departments but only the three countries, or analyze satisfaction of IT employees in all 5 countries, excluding HR employees.

1. When people install the Happy Days Fitness Tracker app, they are asked to "opt in" to a data collection scheme where their level of physical activity data is automatically sent to the company for product research purposes. During your interview with the company, they tell you that the app is very effective because after installing the app, the data show that people's activity levels rise steadily.

**Answer:**

Naturally, people who have high levels of activity are more likely to opt in to data collection when they install this app. Likewise, when they install this app and opt in to data collection, a perception that their image is affected by people viewing the collected data may bias them towards exercising more, a light shade of accountability.

A bias-free experiment would be one where data from app usage is collected without bringing surveillance into the user’s mind. Such as in user agreements, for which all users will have to accept in order to use this app.

1. To prevent cheating, a teacher writes three versions of a test. She stacks the three versions together, first all copies of Version A, then all copies of Version B, then all copies of Version C. As students arrive for the exam, each student takes a test. When grading the test, the teacher finds that students who took Version B scored higher than students who took either Version A or Version C. She concludes from this that Version B is easier, and discards it.

**Answer:**

We can logically assume that students that arrive the earliest are either those with most preparation for the exam, or the exact opposite; they may not really care about the exam, or have just come early to prepare their surroundings to cheat (which would have failed in the case of multiple test versions). The same can be said about version C students, because tardiness can come from those who do not care about their class, or from those who care to the point that they use every last minute to revise.

To correct this, she could have just randomized the order of the stack for a more randomly selected version per student.