

Challenge: Evaluate an experiment analysis

Now it's time to flex your critical evaluation skills. Read the following descriptions of an experiment and its analysis, identify the flaws in each, and describe what you would do to correct them.

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.
 - These two tests do not have any similarities between them. Firstly, the two deliveries are not from the same person. Secondly, the message is not the same, nor is it repeated to both groups. Therefore, there is no conclusive way, as there has been no cross-examining of the tests between the two groups.
2. 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.
 - Jar Jar was the worst character in Star Wars, so this is already not up for debate. However, from an experimental perspective, Jar Jar had a high success rate because he was sent to favorable planets. Windu may or may not have been successful in these planets that Jar Jar visited, but the real scenario remains that he was sent to the unfavorable ones, which is why he did not succeed.
3. 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.
 - You would assume companies with HR would have a higher correlation with better job satisfaction. The other two may produce different results from the other three countries. Also, the five countries may have different perspectives on happiness due to environmental, internal, and/or external factors.
4. 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.

- The activity levels rise only since the data collection itself has risen. There is no proof that the activity increases from using the app. It is more effective for the company than the actual users, as the company will be guaranteed data, but users do not guarantee more activity.
5. 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.
- It could have been random chance that the Students who studied and took test B, knew those topics better. They could have also all sat in the same line and the teacher could have given one line the same papers, making it easier to cheat.