Drill-BC-1.4.4

Drill: Challenge: Evaluate an experiment analysis

Q1. 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..

**Bias types:**

**Selection bias, Bias in assignment to conditions, contextual bias, observer bias.**

Here the there is sampling bias. The 50 captured droids are basically angry since they are captivated and are so predisposed to anger. The sample selected is biased towards responding more to anger slogan. The sample selection should be such that the groups should not be having any of the specific test parameters already enhanced in them.

Instead one should not captivate them and then deliver the slogan and see who willing recruiting to which group, which will tell the effectiveness of a slogan.

Q2. 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.

There is a selection bias in the experiment

The general principle for any experiment is that the two groups selected should be similar to each other but here one group Jar Jar is sent to friendly planets which is more biased to have favorable feelings towards Jedi when compared to unfriendly planet.

Instead one should the two groups to either friendly planets only or only to unfavorable planets. Then will know who among the two envoys is effective in promoting favorable feelings toward the jedi.

Q3. 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.

Here since the HR workers and IT workers the two groups in the study are not equally distributed across the five countries, we need to send surveys and collect data from all the HR employees and IT employees and take a percentage of job satisfaction rate since taking average will give a biased result since there may be more or less of each type of employees in job category.

Another way to do this is take randomly equal number of IT workers and HR workers spread across different sites and different countries and then calculate average job satisfaction rate for each job type.

Q4. 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.

Here is there is a flaw in the analysis. i.e. they are comparing the people’s activity levels after installing app to non-existing activity level baseline. i.e .they are comparing something to nothing which is not possible. They don’t have the data before installing the app. After installing the app obviously, the activity levels will be higher than 0.

Instead one should consider the first month after installing the app as baseline and compare to that and let the user know whether the activity level is changing.

Q5. 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.

Here the way the experiment is executed has a flaw a contextual bias. As the students come in they take A then B and then C. May be the students who come in the middle (B) may perform better than students who either in the early part of beginning of the test (A) or late part of the beginning of the test (C).

In other words the sample is not randomly distributed to handle the three versions of the test.

Instead the teacher can randomely mix the versions of the three tests and let the students take the tests.