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STAT 582

Task 2

Today we watched Scenario 1 from a new set of videos that address challenging situations in collaboration:

Sharp, J. L., Griffith, E., and Higgs, M. D. (2021). "Setting the stage: statistical collaboration videos for training the next generation of applied statisticians," *Journal of Statistics and Data Science Education*, 29(2): 165-170. <https://doi.org/10.1080/26939169.2021.1934202>. The sixth discussion question involves additional script information and then five parts. Read the script and answer each of these five parts. Turn in one copy of your answers on Brightspace and bring a copy to class as we will discuss them.

1. How effective do you think the statistician was at getting the researcher to share the information needed to understand the research and develop a plan? What other strategies could be used?

I think the statistician effectively redirected the conversation and understood the research. She would have requested the physical papers regarding the research as an additional reference.

2. Do you think sharing the anecdotal mistake was an effective communication strategy in this setting? Why or why not? What other strategies might help promote open communication and building of trust?

I believe sharing the anecdotal mistake is an effective communication strategy to convince the researcher why they need to collaborate in a certain way instead of using the statistician as a person to get some results. Sharing the fact how the original approach might be wrong allowed the researcher to open up his opinion.

I believe asking some questions to lead to the same idea is also an effective approach since it helps the researchers think by themselves to reach the idea that they need to collaborate with a statistician effectively.

3. What do you think the statistician did well and what could be improved in this conversation?

Statistician states her idea clearly and concisely. Her explanation was straightforward that the researcher was aware of the importance of the collaboration. Meanwhile, I noticed she would have refrained from some phrases such as “it’s funny or number crunchers.” to avoid offending the researcher.

4. How do you think the statistician did in terms of conveying the idea that statisticians are not just “number crunchers” or “computers”? What other strategies might work to have the information come across in a respectful way?

We can first admit that their idea is common, but we do not necessarily have to offend the other person to protect our dignity in this type of meeting. What is more important is to add how a statistician can maximize the research potential to ultimately publish a statistically proven research.

5. How comfortable would you be sharing previous mistakes with someone you hope to work with? What are the pros and cons of sharing previous mistakes?

I proactively share my previous mistakes to break down boundaries between the other person and become closer. However, there is a risk of the action. People might look down on me if the other person thinks I am silly.

6. Here is the script of additional conversation between the statistician and researcher about details of the study design (not included in the video). Read The Script, preferably out loud with a partner, followed by additional discussion questions.
 - a. What should be considered the experimental unit, or what additional questions would you ask for further clarification?

The experimental unit is a fungus in roses during storage. We can clarify the type of fungus and which part of the rose it sticks to. What is a measurement unit for the fungus? (What would be a covariate here?)

- b. Often disease severity scales are developed by transforming visual estimates of the percentage of the plant or petri dish covered in disease into an ordered categorical scale (such as the integers 1 through 8 mentioned in the script). How does this transformation complicate analysis strategies and subsequent inferences?

There is no definite standard, and the scale depends on the experimenter's sense. One person's scale on one day does not apply to the one on a different day or the one by other experimenters.

- c. Discuss additional challenges that may arise with a scale that is used to assess severity. What other questions would you ask the researcher to understand the measurement?

Can you tell me how you decided the measurement time frame? Why are they 1 day, 4 days, 7 days, and 10 days?

Which arrangements of treatment combination \times cultivar were missed in the experiment?

- d. The researcher originally suggested "ANCOVA" for the statistical analysis. Discuss reasonableness of the suggested approach given the design and data. Discuss ideas for more general wording that avoids implying a clear distinction between ANOVA, ANCOVA, and linear regression, assuming the researcher has very little background in statistical methods or inference?

It seems reasonable in some sense to use ANCOVA since the researcher wants to take into account the effect of the covariate in the statistical test. However, as ANCOVA is a powerful method, it requires more subtle assumptions beforehand. Otherwise, the whole analytical process can be meaningless. We need to know a relationship between the factors and the target variable as well as the

relationship between the factors and the covariate. It is too soon to decide which method we use for our analysis.

- e. One strategy the statistician could have used was to ask the researcher to draw a diagram of the design -- and ask questions along the way. Diagrams of the design often lead to incredibly valuable information that may not be gathered through words. It is also a way to check that you, as the statistician, fully understand the design. Think about what possible diagrams might look like for this study -- try to draw your own based on information from the script (and assumed answers to other questions you came up with). Compare your diagram to those created by others and discuss.

