Four (Very Lightly Edited) Essays We Liked: Homework 4 – 432 Spring 2018

Essay 1

How to be a Modern Scientist by Jeff Leek had many useful tips, but I found the advice about formatting and sharing data to be the most useful and relevant to my own life. The advice can be found in the "Data Sharing" section and the need for raw and tidy datasets as well as a codebook with variables coded with as much information as possible is suggested. I particularly found the pages 31 and 32 about how to code variables the most important. It talks about missing data being classified as NA, categorical and ordinal variables being written out instead of numbered and is primarily used to avoid confusion for the researcher in the future while also making data sharing more efficient and accessible.

The information about data sharing and ways to code variables was meaningful to me because it reminded me of a situation that could have been avoided with this method. I am a research assistant and I work with various datasets. One dataset I saw had the unknown values as 99 and the categorical/ordinal variables were already coded as numbers. The previous people working on it did not make the codebook very clear and some of the categories were switched (3s were 4s). If the variable codes were written out and the 99's replaced with NA's it could have avoided a lot of time and energy learning about the data. It also is useful because I can apply this method of coding variables to datasets I may build in the future. This idea/method of coding variables is crucial because it allows data sharing to be easier which can advance the science at a faster rate. It also allows for a more uniform approach to coding variables which is useful for all researchers to adopt in their own protocols and methods; which shows that coding variables and data sharing methods are valuable tools Leek talks about.

Essay 2

The most useful piece of advice I got from Jeff Leek's book was the focus of talks early in your career. These were to meet people, to get people excited about your ideas, make people understand your ideas, and practice speaking and convince people that you are a good speaker (page 57, section: scientific talks). He particularly emphasized allowing people to get to know you to help you become well-regarded in your field. Within this section he discussed how to structure your talk with the key points: tell a story, simplify rather than over-complicate, and explain your problem. These pieces of advice regarding scientific presentations were most helpful to me.

Jeff Leek's discussion of scientific talks, particularly the focus and structure of the talk, was the most meaningful to me because I am starting my career in academic medicine and am starting to give talks at national meetings. Prior to this year, I mostly gave standardized poster presentations or presented cases as a trainee, but I am now transitioning to my role as a content expert, which is intimidating. However, reading the advice about the focus of a talk will help me to remember that I should make my science understandable, come across as personable but still science-minded (ie: not TED-talk-y), and become better at speaking over time. These small pieces of advice will help me as I am in the process of developing a talk for an international conference in April. This is my first solo talk and I think that Jeff's advice will help me to make this presentation less stressful (to me), more engaging (to my audience), and will allow me to present my

science in a more effective way. I hope to teach these pieces of advice to my trainees moving forward as well, as I wish I'd learned this at the beginning of my training.

Essay 3

The section in How to Be A Modern Scientist that struck me the most was that of data sharing. Leek postulates that all data should be posted publicly for open access when publishing a paper. A key part of this is posting both the raw and tidied data, so that others can reproduce the research and analyze it in new and useful ways.

Prior to this course, I never thought of data sharing as a necessity for anyone outside of the immediate research team. If anything, my thoughts aligned more with the second reason Leek gives for why people resist data sharing: fear over loss of personal advancement and funding. However, reflecting on my research experience over recent years, the benefits of data sharing are far clearer to me than the shortcomings. In my undergraduate research lab, I was given the task of analyzing some data that were two decades old. I speculated that the data were flawed and incomplete and requested that a collaborator send their data file, so I could compare the two. After much grumbling on their part, I finally received the tidied file and found that the numbers were significantly different than the data I had. This researcher either no longer had, or chose to not send, their raw data to me, and therefore the project was never completed. Experiences like this demonstrate the importance of open discussion and sharing of data and ideas between collaborators and other researchers to produce accurate, ethical, reproducible, and high-quality research.

Essay 4

The most useful and relevant piece of advice I took from reading Jeff Leek's book are in the chapter on publishing (Page 14). Specifically, the sub-section on responding to referee comments had some great advice. As someone in academia, I often receive comments for the manuscripts I submit to the journals. Jeff Leek's systematic approach on how to respond to the comments was particularly helpful. He advises to highlight in bold the page number and subsection of the manuscript where each of the comments is addressed.

The advice on how to best respond to reviewer comments is particularly useful to me. As someone in academia, I tend to submit 2-3 manuscripts a year. In Jeff Leek's own words "Referee reports are often maddening". Responding to them is challenging and the potential acceptance of the manuscript depends on it. Honing these skills, that are rarely taught formally in graduate school can be very helpful. In the recent past, I had a particularly hard reviewer (it is always Reviewer 3) whose 3 pages of comments on just about everything in the manuscript terrified me. I was eager to please the reviewer and at the same time make sure that I stand my ground about things I believe are right. I think Jeff's advice on the step-by-step approach would have helped me tremendously. I agree with the author that breaking the comments into smaller parts and answering them is very helpful. The most important suggestion is to highlight the page number and subsection where the comment is being addressed. This is particularly important as it helps the reviewer know where exactly the suggested changes have been made. His suggestions have helped me understand the publication process clearly and I now know a better way to respond to reviewer comments.