**Homework 2 General Feedback**

**Reading questions**

For the cat food question, many of you wrote about something other than the desired answer, which was non-independence. Some of you made your cases for alternatives decently, but ultimately this is still the one we care about the most here. People probably feed their cats similar amounts if they have more than one. Solutions include calculating household means or randomly selecting one cat per household.

Many of you reported increasing the alpha criterion as a solution to Type II errors. This isn’t incorrect, but I wanted to at least note that there are many solutions that would be preferred to this. Really, we want to increase statistical power: increasing observations, improving study design, etc.

When we ask you questions like the one about the *F* statistic, we’re usually looking for a straightforward, “plain English” answer. Many of you used jargon to explain this, which makes it sort of unclear to me whether you’re just rephrasing what you read in the book or actually deeply understand what’s going on (though I tend to assume the latter). In the future, try to use simpler explanations. For this question, the numerator of the *F* statistic indicates how much our parameter(s) decreased the error, while the denominator represents how much error reduction we’d expect if we added some random meaningless parameter. This ratio indicates whether our parameter(s) meaningfully reduce the error.

**Data analysis**

In general, the code is going well. There were tons of different answers to questions asking for equations of models. See the key to get this ironed out to prevent problems in the future.

The overwhelming majority of you, in reporting your conclusion for both the main model comparisons for this week’s homework, used a lot of stats jargon regarding rejecting the null, significance of statistics, etc. You should continue to include some stats in the future obviously, but please also give us the real-world interpretation of what you found. Like, why should I care about the result of the test? What does it actually tell me about the variables you’re analyzing? The statistical methods are worthless if they can’t be interpreted in plain English.

One caution that doesn’t have much to do with correctness, but is still important, is a note on data-driven approaches. A number of you wrote sentences about how the alpha value passing our .7/.8 criterion means we don’t need to drop any items. This is true, but even if we didn’t have a .7 alpha, and even if dropping 1+ items would pull us past that criterion, that’s not necessarily justification for doing so. Data-driven approaches to analysis have been a contributing factor to *p*-hacking and bad science. One thing we’ll practice is thinking about good reasons for excluding items / observations that aren’t totally data-driven.

Remember when computing a difference score to subtract the earlier thing from the more recent thing (e.g., Cats5 – Cats1). If there were 3000 cats then and 2000 cats now, the difference is, vitally, -1000. Doing this the opposite way will yield the same estimates but they will be the opposite sign, leading to incorrect conclusions.