Quiz 8

1 – According to Hurlbert, if you have a limited number of experimental units, random assignment of treatments may not be sound practice. Why not?

* Because you can’t block samples
* **Because you may get clumping of treatments**
* Because you may get collinearity
* Because you may get swamping

**He argues that you might get clumping of treatments which might cause pseudoreplication**

2 - Consider the following experiment. We have nine fields, each with a single experimental plot in it. Each plot receives one of three treatments: control, treatment 1, or treatment 2. What is the limitation of this experimental design?

* **Can’t include a field effect**
* You may commit pseudoreplication in your analysis
* Can’t distinguish among the treatments
* You may have collinearity

**You only measured each field once, so you can’t include a field effect. This means you can’t account for the effects of field.**

3 – Consider a lake that is undergoing a natural experiment in the form of predator colonization. A nearby lake remains without predators. You sample benthic insects in 20 plots in each of the two lakes and analyze the data statistically to see if predator presence influences density among the 40 plots. Have you committed pseudoreplication?

* No
* **Yes**

**You have! You only have 1 predator lake and 1 no predator lake. You don’t have replication of lakes with and without predators to infer the effect of predators on benthic insects in lakes. Instead, if you want to know if the two lakes are different, you can do that. To test the hypothesis, you need lakes as samples; not subplots within lakes.**

4 – In a clinical trial, we give 30 individuals a placebo and 30 individuals an experimental pain killer. We then measure their pain levels over the next 4 hours in 15 minute intervals. If we examine how pain level of individuals change over time using all 960 measurements, have we committed pseudoreplication?

* Yes
* **No**

**The key phrase here is “*over time*”. If the question said “*pain levels differ between those who received placebo and drug using all 960 measurements*”, then YES we would commit pseudoreplication. However, in this case, we are looking at the Drug x Time interaction, and with interactions every single point is a true replicate because time, the x-variable, changes. Drug does not.**

5 – Which of the following is not one of the four types of pseudoreplication that Hurlbert discusses?

* Simple
* Temporal
* Implicit
* Sacrificial
* **Inferential**

**DOUBLE CHECK THIS AND MAKE SURE IT’S RIGHT**