

FRES 1010 — Mythbusting, Skepticism, and Statistics
Homework 8 – Due Wednesday, April 5

Homework Guidelines:

- The written portion of your homework assignment (if there is one) is due at the beginning of class on the due date specified above. **No late homeworks will be accepted.**

Data Collection Assignment:

Myth: *Tapping on the top of a shaken soda can will reduce or eliminate foaming when the can is opened.*

This week we are going to investigate this piece of popular wisdom. I've seen this done and done it myself many times, but I've never really been sure that the tapping does anything helpful at all. This week, we'll find out.

Materials: A six-pack of 12 oz. cans of soda pop (your choice — can be as cheap as you want, any flavor), a pen, a penny, and six 16 oz. foam cups (supplied in class).

Treatments: There are two obvious treatments in this experiment: tapping on the top of the can after shaking but before opening (we'll call this treatment A), and no tapping (treatment B).

Response Variable: The volume of soda that foams over the top and out of the can. We'll measure this by measuring the volume remaining in the can and subtracting this from 12 oz.

Experimental Design: A randomized complete block design with three replicates of each treatment within each block. Here, the blocks are you, the students in this class who are conducting the experiment.

Procedure:*

1. Buy a six pack of soda pop. Any flavor and brand will do, so I suggest that you buy the cheapest you can find. Be sure to buy standard 12 oz cans.
2. Take your six pack of soda, your cups, your penny, and your pen outside to conduct the experiment.
3. Take a can of soda and shake it vigorously for 15 seconds. Don't bang it, throw it, or otherwise go nuts shaking it up — simply shake it vigorously with your hands for 15 seconds. Try to do this in a standard, repeatable manner.

* Read this entire procedure before beginning your experiment.

4. Flip a penny. If it lands heads up, this can is to be tapped (treatment A). If it lands tails, this can is not to be tapped (treatment B).
5. Apply the treatment (tapping, no tapping). In the tapping treatment, tap the lid with your fingertips 10 times rapidly in succession. Then set the can down on a flat surface and open it **all the way**.
6. After the can is done foaming over the top, pour the remaining soda pop into one of your cups and set it down on a flat surface. Use your pen to mark on the cup where the soda comes to (the level of the top of the soda inside the cup). Also write A or B on the cup to indicate the treatment that was applied. Once the cup is marked, you can throw away or drink the soda.
7. Repeat steps 3–6 for the next can of soda until you finish all 6 cans. Step 4 does the randomization to treatments. We want an equal number of cans in each treatment, so once 3 cans have been randomly assigned to one treatment or the other, automatically assign the rest to the other treatment so we obtain a balanced experimental design. Make sure you shake each can as close to exactly the same way as possible. Also make sure that you open all cans all of the way (pull the tab toward you as far as it will go) so that we get maximal foaming and overflow. You may get wet, but it's in the pursuit of science, so deal with it.
8. Next week, bring your six cups to class. I will determine the overflow volumes based upon the fill lines you marked on your cups. Once those volumes have been determined, we'll analyze the data to see if tapping the top of a shaken soda can really works.

That's it. Have fun. See you next week.