Chapter 4 REVIEW HW

AP Statistics Practice Test (page 274)

T4.1 c. A census is defined to be measuring all individuals in the population.

T4.2 e. Ignore numbers that are larger than 816 or are duplicate numbers.

T4.3 d. In order to infer cause and effect, we must run a well-designed experiment. This was an observational study.

T4.4 c. This is the definition of a Simple Random Sample.

T4.5 b. By randomly assigning treatments we are attempting to make the different groups look as similar as possible so that we can reduce the likelihood of a confounding variable.

T4.6 b. It is very difficult to show cause and effect using observational studies. It is much easier in an experiment where the researcher has control over how the treatments are applied.

T4.7 d. By stratifying we can control how many people we survey in each of the different kinds of areas.

T4.8 d. Bias in the responses means that you are getting responses that are systematically different from the truth.

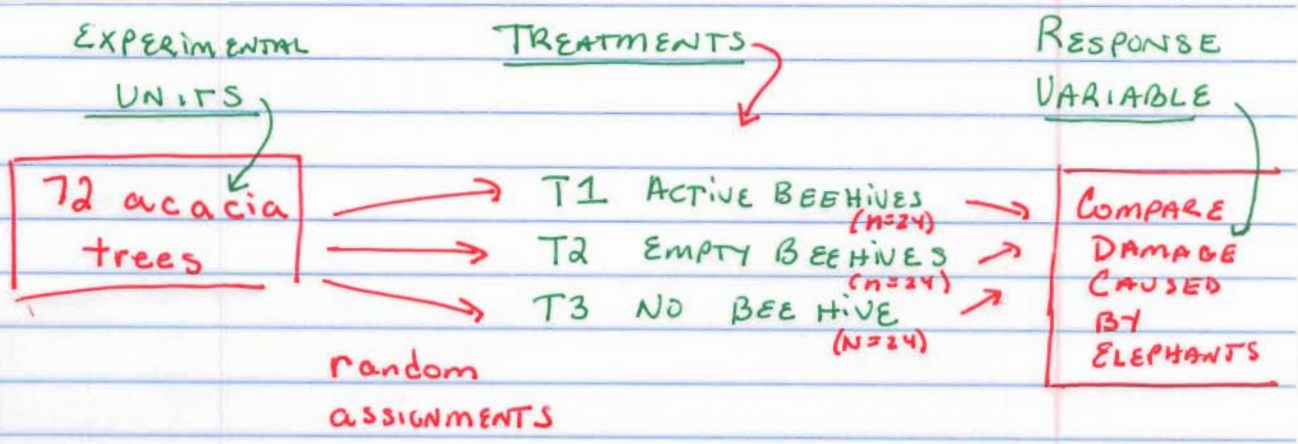
T4.9 d. This is a completely randomized design because you randomly assign subjects to one of the four groups. There are two factors: Length of ad (30 seconds or 60 seconds) and Repeat (1 time or 3 times).

T4.10 b. In a matched pairs design, the two observations in the pair should be as similar as possible. So use a subjective method for pairing the plots. Once the pairs are chosen, then randomly assign the two treatments to the two plots in the pair.

T4.11 d. The teachers who responded likely feel more strongly about the issue and shouldn't be considered to be representative of the entire population of teachers under consideration.

4R HW

T4.12



(B) COMPLETELY RANDOMIZED DESIGN

① RANDOMLY ASSIGN THE ACADIA TREES TO THE 3 TREATMENTS. EACH TREATMENT WOULD BE ASSIGNED 24 TREES.

② USE HAT, RANDOM DIGIT TABLE, OR TECHNOLOGY TO RANDOMLY ASSIGN TREES. TO DO SO

- ASSIGN EACH TREE A NUMBERS 01-72
- USE A RANDOM NUMBER TABLE TO PICK 24 2-DIGIT NUMBERS IN THE RANGE 01-72 EXCLUDING REPEATS.
- THE 1ST 24 numbers will get beehives in these trees.
- THE NEXT 24 numbers get empty beehives
- THE REMAINING trees will remain empty

③ AT THE END, COMPARE THE DAMAGES CAUSED BY ELEPHANTS TO THE TREES WITH ACTIVE BEE HIVES, EMPTY BEE HIVES, AND NO BEEHIVE.

4R Hw cont

T4.13 (a) This is NOT a simple random sample (SRS) because not all samples were possible. For example, given their method, they could not have all respondents from the east coast.

(b) One adult was chosen at random to control for lurking variables. Perhaps household members who generally answer the phone have a different opinion than those who don't generally answer the phone.

(c) There was undercoverage in this survey. Those who do not have telephones, or those who have only cell phones were not part of the sampling frame. So their opinions would not have been measured. Since cell-phone-only users tend to be younger, the results of the survey may not accurately reflect the entire population's opinion

4R cont

T4.14 (a) • This is a matched pairs design.
- EACH OF THE 11 individuals will be blocks.
- EACH PARTICIPANT WILL TAKE THE CAFFEINE ON ONE DAY AND THE PLACEBO ON THE OTHER.
- THE ORDER IN WHICH THEY TAKE THE PLACEBO OR CAFFEINE IS DECIDED RANDOMLY.
- THE TAPPING TEST IS ADMINISTERED AT THE END OF EACH 2 DAY TRIAL.
- THE RESULTS TO BE COMPARED ARE THE DIFFERENCES BETWEEN THE CAFFEINE AND PLACEBO SCORES ON THE TAPPING TEST.

THE BLOCKING WAS DONE TO CONTROL FOR INDIVIDUAL DIFFERENCES IN DEXTERITY.

(b) The order was randomized to control for any possible influence of the order in which the treatments were administered on the subject's tapping speed.

(c) A DOUBLE-BLIND MANNER CAN BE DONE BY ENSURING NEITHER THE SUBJECT OR ADMINISTRATOR OF THE TREATMENT HAS KNOWLEDGE OF THE ORDER IN WHICH THE CAFFEINE OR PLACEBO WAS ADMINISTERED