

A.P. Statistics
Assignment 3.7

Remember to show your thinking through your work.

- 1) We have distinguished two types of studies: observational and experimental. Briefly explain the essential difference(s) between these two types of study.

- 2) In response to Press reports about music companies inserting secret messages in their recordings, an experiment was conducted. The study attempted to examine the role of suggestion in perceiving "messages" in rock-and-roll recordings presented backward. (The music had been recorded backward by a stereo system with a reel-to-reel tape recorder, and then re-recorded to a cassette player.) The stimuli consisted of three rock-and-roll songs: "Revolution No. 1," by the Beatles; "Stairway to Heaven" by Led Zeppelin; and "Black Sabbath" by Black Sabbath. Subjects for the experiment were volunteers from introductory psychology classes, and were randomly assigned into one of three groups. Those assigned to Group I (the control group) were told to listen to the music and write down any reactions. The Group II members were asked to listen and write down any words or phrases they heard, but were not given any hints about the possible content. Members of Group III were told that messages had been recorded, and that their task was to detect the messages and write them down. All subjects in each Group listened to the same songs in the same order. In the resulting analysis it was found that the members of Group III claimed they heard more phrases than the members of Group II, and the members of Group II claimed they heard more phrases and words than the Group I members.

- a) What is the explanatory variable (factor) for this experiment?

- b) What is the response variable for this experiment?

- c) In questioning the subjects after completing the study, it was found that 80% of the subjects in Groups II and III had read recent reports in the newspaper that music companies had inserted messages in recordings. Only 33 % of the individuals in Group I (the controls) had read of this in the Press. How does this information affect the interpretation of the results?

- 3) The following paragraph describes an actual study. After reading the description, determine whether the study is an observational study or an experiment. Justify your answer with specific references to the information in the study.

"We compared paired daytime and night counts of wild brook trout, brown trout, and rainbow trout made by the same snorkelers in five streams during August 1994. Overall, we counted 109 trout in the daytime and 333 trout at night. We speculate that trout counted at night were present during the daytime but were hidden from view. Biologists should consider that trout behavior and susceptibility to being seen might vary a great deal between daytime and night, even during summer. In some streams, the majority of trout may not be seen during the daytime."

- 4) You are interested in the extent to which taking Vitamin C in high doses (1000mg per day) prevents the catching of a cold. You have 300 volunteers to participate in your study. You know that you need to have a control group that will receive no treatment.
- a) Identify the treatment.

- b) Either in paragraph form or in diagram form, design the experiment to answer your question. Be sure to include the element of randomization in your design.