

Psychology 515 - Experimental Design

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Homework No. 7 - Not to be handed in

1. A conflict theorist has scaled TAT cards and has chosen seven that are equally spaced along a sexual content continuum. He predicts that low-guilt subjects will give increasing numbers of sexual responses as sexual content increases, and that high-guilt subjects will show the same number of responses as low-guilt subjects to the lowest sex-content card, but will inhibit responses to the higher sex-content cards in such a way that they will actually show a decrease in sexual responses as sex content increases. Assuming 20 subjects in each group, give the sources of variance, df , and error terms, stating explicitly which terms should be significant according to the hypotheses and why.
2. In a study of short-term memory, 12 groups of 10 subjects are run. They are all required to tell whether a comparison tone is the same as or different from a standard presented several seconds earlier. The groups differ with respect to D, duration of the interstimulus interval: D = 1, 2, or 4. They also differ with respect to I, the stimulus presented during the interval: I = blank, noise, tone 15 Hz above standard, tone 30 Hz above standard. It is hypothesized that:

H_1 : D will not influence memory when the interval is blank.

H_2 : The rate of decay (drop in memory over D) will be most pronounced if I = noise, next when I = +30 Hz, next when I = +15 Hz.

Describe the statistical tests that you would make to test these hypotheses.

3. Give the format for the analysis of variance for each of the following situations. Specify general formulas for df and E(MS) for each source of variation. Also give the numerical values for the df , and indicate appropriate error terms for F -tests.
 - a) Six five-man groups (random) are run under a 'high cohesiveness' condition, six under a 'low cohesiveness' condition, two (random) replications of the criterion measure on each man in each group.
 - b) Same as (a) except that the running of the six groups in each 'cohesiveness' condition is divided equally between two experimenters (fixed).
 - c) A learning experiment with an experimental and a control group, eight animals in each, ten trials a day for seven days.