

The Final Laboratory

OK, here are a few problems to wrap up the semester:

1. Assume that you are a reader on a master's thesis committee. A student has carried out a study of the effects of mood on recall for different kinds of material. Each participant from a total sample of 40 was randomly assigned to either a depressed mood-induction condition or a neutral-mood condition. Following the mood induction, each participant was given a list of verbal tasks to solve, some of which were easy and some of which were difficult. The hypothesis motivating the study was that on a test of incidental recall of the verbal tasks the decrement in performance exhibited by the depressed participants would be greater on the difficult items than on the easy items. The following source table was included in the thesis:

Source	SS	df	MS	F
Mood	360	1	360	7.2
Difficulty	160	1	160	3.2
Mood x Difficulty	160	1	160	3.2
Error	3800	76	50	
Total	4480	79		

- a. What is wrong with this analysis?
- b. If the analysis were to be done correctly, what sources, error terms, and degrees of freedom would be used?
- c. How much of the correct source table below could you complete?

Source	SS	df	MS	F

2. Jemmott, J. B. et al. (1988) report a study investigating the effect of academic stress on immune function ("Academic stress, power motivation, and decrease in secretion rate of salivary secretory immunoglobulin A." *Lancet*, 1, 1400-1402.). Immune function was measured five times during the academic year: an initial low-stress period, three high-stress periods associated with major exams, and a final low-stress period. Forty-seven first-year dental students served as participants. Each participant was identified as belonging to one of three personality types on the basis of responses to the Thematic Apperception Test, which was administered prior to the assessment of immune function. The three groups were an inhibited power syndrome (IPS) group, a relaxed affiliative syndrome (RAS) group, and a residual or control (C) group, which consisted of participants who failed to fit the criteria for either of the other two groups. The

dependent measure was the rate of secretion of salivary secretory immunoglobulin A (s-IgA), obtained at each of the five time points. Higher values of s-IgA secretion rate (measured as mg s-IgA/min) reflect stronger functioning of the immune system. Analyze the hypothetical (but realistic) data set “M&D.549.data” in the RM folder (inside Two-Way). Given the researcher’s hypotheses, can you think of (planned) comparisons that would make sense?

3. Suppose that you are a memory researcher. You are interested in the factors that might influence the memory for pictures vs. words. You select a pool of 48 items that can be presented as pictures or words. All of the objects are equally concrete (which is, in part, why they can be presented as objects). Half of the items are words that occur infrequently in the English language and the remaining items occur quite often (low vs. high frequency). Finally, half of each of these items are presented briefly (500 ms) and half are presented for a longer duration (1500 ms). Thus, this is a $2 \times 2 \times 2$ completely within (repeated measures) design: Type of presentation (picture vs. word); Frequency of occurrence (Low vs. High); and Duration of presentation (Short vs. Long). The dependent variable is the number of items correctly recalled (writing the names of the items on a response sheet). (What is the highest score that a participant could receive in each category?) Analyze and interpret the results of this study as completely as you can. (The completely fabricated data are found in RM folder (inside Three-Way)).