QR Lesson Plan for Teaching Independent and Related-samples t-test Designs

originally posted 8-8   - Statistics in Psychology Course – Hunter College

After students have read about and heard lecture descriptions of one-sample, independent and related-sample designs the following activity will be added to the lab materials that I currently use to provide students with more practice designing, explaining and writing about two research designs and the statistical test used in each instance.

**Class Activity 1: (A & B will be done during lecture with C & D assigned for outside of class.)**

a. Students will be paired and one of each pair will be asked to design an Independent-sample study using two groups, while the other will be asked to design a Related-sample study (some asked to do repeated-measures, others paired-samples, others matched-pairs).  These hypothetical designs could be testing any independent and dependent variables that the students wish –they generate their own constructs and are given just 3-5 minutes to do so and write a few notes about their study.

b. Students will share their ideas with each other - explain their study to their partner and answer questions.  They will work together to make any corrections or additions or changes that they wish to the two studies to make them stronger or more interesting. (5-6 min)

 c. Each student will write a brief description of his/her own revised study and post it on specific Blackboard Discussion Board thread.  (this could be done in class or after class depending on timing)

d. Each student will be assigned to review and comment on the study designs of two specific classmates – including what t-test is appropriate as designed, any constructive comments on what they like/dislike about the person’s design, and then how they could redesign the study to test the same hypothesis (same IV and DV) using a different design and a different statistical test.   (This part would be done outside of class and would be due before the following week’s lab meeting.)

**Lab Activity 2: (see worksheet week 7 for the defaults – their own designs may be added for variety.)**

a. Students working in pairs will be given data and study descriptions and will be asked to enter the data in SPSS, analyze it using the proper t-test, and write conclusions based on the results of the statistical tests.  If possible, some study descriptions could be selected from among their designs (1C lab activity).  Students will be asked to complete an example of both independent and related-t designs.  They will do this during the lab with assistance as needed from their partner, the professor and T.A.

b. Students will be asked to share with the class which test they used, how they did it, how they coded or organized the data into variables, what the statistical results were and what they concluded.  One set of data will be analyzed both ways- independent (between) and related-samples (within).  The results of the two will be compared and discussed to highlight the advantages of both designs (such as how repeated-measures designs removes individual difference variation).

These are my Learning Goals

Goal 1:  Explain the differences between two common research designs:  **independent-samples** (or between subjects) and **related-samples** (e.g. within-subjects, paired-samples, or repeated-measures).  Students will also be able to correctly recognize examples of both designs and generate original examples.

Goal 2: Students will be able to calculate both the independent t-test and related-sample t-test.  Given data and a study description, they will apply the proper t-test, and do the calculations by hand or run the analysis on the computer.  They will be able to explain why that particular t-test was chosen for the example.

Goal 3: Students will be able to interpret results of these two statistical tests and write conclusions about what they mean in simple English.