

Statistics Assignments Using Excel®

Assignment #10: Two-Way Between Groups ANOVA

A social psychologist conducts an experiment to determine the best way to design a message for college students about the importance of engaging in safe sex. She hypothesizes that two factors impact the effectiveness of the message: (a) the medium used to deliver the message (lecture, video, or pamphlet), and (b) the emotional tone of the message (fear, neutral, or humor). The dependent variable is a measure of behavioral intention to engage in safe sex behavior (higher score indicating greater intention). She randomly assigns 45 participants to 9 groups, and obtains the following data:

| Emotional Tone | Medium | | |
|----------------|---------|-------|----------|
| | Lecture | Video | Pamphlet |
| Fear | 7 | 6 | 5 |
| | 6 | 5 | 4 |
| | 7 | 7 | 7 |
| | 4 | 6 | 4 |
| | 4 | 4 | 6 |
| Neutral | 6 | 6 | 6 |
| | 9 | 4 | 4 |
| | 8 | 7 | 5 |
| | 4 | 5 | 8 |
| | 2 | 6 | 4 |
| Humor | 7 | 4 | 8 |
| | 7 | 2 | 5 |
| | 4 | 1 | 4 |
| | 8 | 2 | 6 |
| | 4 | 1 | 4 |

- Using Excel, analyze these data by performing a two-way between-groups ANOVA. Create formulas to calculate the SS terms and the rest of the ANOVA summary table.
- Include the effect size (eta-squared) for the medium, emotional tone, and medium X emotional tone effects in your ANOVA table (you'll need to create your own formulas).
- Create a graph to show the results, with error bars (estimated standard error of the means).
- Insert a textbox in which you report the results of the ANOVA, the effect sizes for any significant effects, and refer to the graph to describe the pattern of any significant results.
- Do a final save and submit your work.

Author contact and copyright information:

Michael J. Tagler, Ph.D., Department of Psychological Science, Ball State University, Muncie, IN 47304, mjtagler@bsu.edu
 Copyright 2010 by Michael J. Tagler. All rights reserved. You may reproduce multiple copies of this material for your own personal use, including use in your classes and/or sharing with individual colleagues as long as the author's name and institution and the Office of Teaching Resources in Psychology heading or other identifying information appear on the copied document. No other permission is implied or granted to print, copy, reproduce, or distribute additional copies of this material. Anyone who wishes to produce copies for purposes other than those specified above must obtain the permission of the author.
 Microsoft Excel is a trademark of the Microsoft group of companies.

The following textbook contains detailed instructions for using spreadsheets in an introductory statistics class:
 Tagler, M. J. (2009). *Understanding basic statistics with spreadsheets*. New York, NY: Pearson Custom.