EPSY 5221

Principles of Educational & Psychological Measurement G-Theory LAB

A performance assessment has been designed to help select lab assistants for the Chemistry Department. There are four stations at the assessment center: (1) acid neutralization, (2) measurement of mass and volume, (3) container transfer of toxic waste, and (4) cold fusion. The Chemistry Department is trying to figure out how many tasks are needed at each station and how many raters should be employed to yield generalizable and dependable scores. Each task below is worth 5 points.

Review the results of the G-Study for Station 1 (acid neutralization): a P×R×T random effects design employing 8 students, 3 tasks, and 3 raters.

1. Define each variance component from the G-Study, report the estimated values for each of the variance components, and identify the major sources of troublesome variance.
2. What does this imply for the design of a performance assessment involving acid neutralizing science tasks and the use of raters?
3. Examine the generalizability and dependability coefficients for this G-Study. What do these imply for the current design using 3 raters and 3 tasks? [You should examine the results from the D-Study where you have 3 raters and 3 tasks (all random).]

Review the results of two D-Studies (a) varying the number of tasks from 2 to 4 with 2 raters, and (b) varying the number of tasks from 2 to 4 with 3 raters.

1. For which D-Study design would you advocate (considering that additional acid-neutralization tasks are cheap, additional raters are expensive, and you would like to generalize to acid neutralization tasks not represented in the measurement procedure)?
2. Describe one example of how you might use (or recommended the use of) G-Theory in your work or research (either in the past, now, or in the future).
3. Compute by-hand the generalizability coefficient and the dependability coefficient for the D-Studies selected in #4. What do these say about the measurement procedure?

# A BRIEF GENOVA USER’S GUIDE

Copy GENOVA onto a floppy disk and place all control card files on the same floppy disk. You can also put these things in the same folder on your own computer. Or, in the computer lab, create a folder with your name in the “Temporary Save Folder” on the desktop and save these things in that folder.

The input file must be a text only file. White space must be used between parameters, not tabs.

The filename should be specified with extensions, like “.txt” or “.crd”

* Double click GENOVA.exe, a window will appear
* You will see the prompt “Unit 5?”
  + Type the name of the file containing the control cards and hit the return key
* You will see the prompt “Unit 6?”
  + Type the name for the output file and hit the return key
  + E.g.: output1.txt
* GENOVA will process the control cards and input data. When finished, the output file will be in the same folder as the GENOVA.exe application.

To replicate the sample output:

* Double click GENOVA.exe
* Unit 5? 🡪 type: sample.txt (this is the pre-prepared sample control file)
* Unit 6? 🡪 type: output.txt (this will be your newly generated output file)
* Open Microsoft Word or alternative 🡪 open output file output.txt
  + Layout
    - Set margins: Narrow - 0.5 (top, bottom), 0.5 (left, right)
    - Set orientation: Landscape
  + Editing 🡪 [Select all]
    - Set font: Courier New, 9 pt.

There will be several output pages that are not needed. Be judicious in deciding which pages to combine by removing page breaks, delete, and print.

**DO NOT ATTACH THE FULL OUTPUT. PULL THE TABLES THAT ARE RELEVANT FOR YOUR RESPONSES.**

You will find the full GENOVA manual at the class website.