

Psych Testing: Homework #4

Item Analysis – (Each of you should be able to do this on your own)

Download and Open the “item_analysis_example.sav” data set in SPSS and use it for questions 1 - 3.

1. Item Difficulty – the difficulty for dichotomous items like these can be found by simply calculating the mean for each item (for dichotomous items the mean is the proportion of 1s).
 - a. SPSS instructions:
 - i. Analyze -> Descriptive Statistics -> Descriptives
 - ii. Move each of the “items” over to Variable(s):
 - iii. Click on options and un-check everything except Mean and click on continue
 - iv. Then click on OK.
 - v. Save all the output and attach it to the end.
 - b. Question:
 - i. Which 2 to 3 items seem to be the most difficult?
 - ii. Which are the easiest?

2. Extreme Group Discrimination Method – I’ve already identified the high, medium and low responders based on their total test score (I separated them based on the 33rd and 66th percentiles).
 - a. SPSS Instructions:
 - i. Click on Data (in the upper tool bar) -> Split file
 - ii. Click on Organize Output by Groups and move “Discrimination Groups” over into “Groups Based On:”
 - iii. Your data will be reorganized (so don’t worry when it changes).
 - iv. Now rerun the analysis from 1.a above.
 - v. For each item take the mean in the high group and subtract the mean from the low group and include those differences attached to the end of your homework.
 - b. Question:
 - i. In your own words, explain why this is a method of testing for item discrimination?
 - ii. Which 2 to 3 items seem to be the most discriminating items?
 - iii. Which are the least discriminating?
 - iv. For some of the least discriminating items does there seem to be a reason, connected to the difficulty, why the items are not discriminating well?

3. Correlation Method for item discrimination
 - a. SPSS instructions:
 - i. Take the split file off by following the instructions in 2.a.i-ii and click on “Analyze all Cases”
 - ii. After you remove the split file, go to Analyze -> Scale -> Reliability Analysis.
 - iii. Move all of the “items” over and click on the Statistics button. Check “Scale if item deleted” and click on continue and then OK.

- iv. Attach the tables to the end.
 - b. Question:
 - i. Using this method, which items seem to be the most discriminating items?
Does this match up with the extreme group method?
 - ii. Which are the least discriminating? Does this match the extreme group method?
4. Item Characteristic Curves
- a. SPSS instructions:
 - i. Creating Groups
 1. Transform ->Visual Binning
 2. Move Total into "Variables to Bin:" and click on continue.
 3. Type ICC_groups into "Binned Variable:".
 4. Click on "Make Cutpoints" -> "Equal Percentiles Based on Scanned Cases" and type 5 into the "Number of Cutpoints" -> click on apply.
 5. Label Each "Value" accordingly (i.e., "0-4", "5-6", "7-8", "9-10", "11", "11+") and click on OK.
 - ii. Creating Graphs
 1. Graphs -> Legacy Dialogues -> Keep it on "Simple" and "Summaries of Groups of Cases" and click on Define.
 2. Move the ICC_groups variable you made over to "Category Axis".
 3. Under "Line Represents", click on "Other Statistic", move Item1 over to "Variable" and click on "Change Statistic". Click on "Percentage Above" and put "0" in "Value". Click on Continue.
 4. VERY IMPORTANT: Click on "Paste" (not OK). Copy and paste the syntax 14 times for a total of 15. Besides the first time, change "item1" to "item2", "item3", etc. through "item15". In the syntax window go to "Run" and select "All".
 5. Copy and paste the tables to this assignment
 - b. Questions:
 - i. Which items seem problematic? Explain.
 - ii. According to the graphs, which item is the most discriminating? Explain.
 - iii. According to the graphs, which item is the most difficult? Explain.

Open the "STARS1.sav" data set in SPSS and use it for question 4.

- 5. Calculate the difficulty and discrimination (using the correlation method only).
 - a. SPSS instructions
 - i. Analyze -> Scale -> Reliability Analysis.
 - ii. Move all of the questions over and click on the Statistics button. Check "Item", "Scale" and "Scale if item deleted" and click on continue and then OK.
 - iii. Attach the tables to the end.

- b. Question:
 - i. Think about it for a second and look at the means which are given to you in the tables. Which items seem to be the most difficult items? Which are the easiest?
 - ii. Which are the most discriminating? Which are the least discriminating?
- 6. Item Characteristic Curves
 - a. SPSS:
 - i. Follow the steps in 4 above except alter them to fit the items (e.g., match the group labels to the groups that get created, the items are not dichotomous so the percentage above 1 won't work).
 - b. Question:
 - i. Which items seem problematic? Explain.
 - ii. According to the graphs, which item is the most discriminating? Explain.
 - iii. According to the graphs, which item is the most difficult? Explain.