ConstructMap v4.6
Instructions for Generating the Chapter 8 Examples

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TABLE 8.1 – ITEM STATISTICS FOR THE PF-10 EXAMPLE (SELECTED ITEMS)[11]

1. Select the menu option **Estimation Tasks → Proficiency Estimation Options** and confirm that Estimation Type is set to MLE.
2. Select the menu option **Reports → Item Reports → Classical Item Statistics**.
3. Enter a Title of "Classical Item Statistics for Observed Responses".
4. Browse to the directory where you want to store the file and enter a File Name of `pf10_itanal`, and then click on Save.
5. Click on OK to continue. The Item Analysis report will be displayed on the screen and also stored on your system in the folder you specified.

```
projects/pf10_trich/pf10_itanal.txt                    Nov 5, 2012  2:13:23 PM
------------------------------------------------------------------------------
            Classical Item Statistics for Observed Responses (MLE)
Number of Active Items = 10
Students = 2054
------------------------------------------------------------------------------
..............................................................................

Item: VigAct      Item Set: base      Variable: pf
 (by parameter) Infit MNSQ = 1.21 t = 6.16 Outfit MNSQ = 1.22 t = 6.60

Categories            0     1     2 missing
Responses             0     1     2
Count             1,043   874   137       0
Percent (%)       50.78 42.55  6.67
Pt-Biserial       -0.63  0.53  0.20
Mean Ability       0.15  2.87  3.29      NA
SD Abilities       0.65  0.91  1.01      NA
Step Difficulties          1.66  5.02
Thresholds           NA   1.62  5.05
Error                NA   0.04  0.12

==============================================================================
```

Figure 1. Item analysis report content for item "VigAct" before reformatting in Word.

1. Open the `pf10_itanal.txt` file in a text editor (such as Word) and modify the headings and labels to match Table 8.1. Delete the lines relating to steps, thresholds, and error and the "missing" column.

[11] These instructions assume the reader is continuing after completing the Chapter 7 instructions.

FIGURES 8.3 AND 8.4 – EXAMINING ITEM DIF – COMPARING THE THRESHOLDS

1. Select the menu option **Estimation Tasks → Filter Students for DIF Analysis**.
2. Check the Filter checkbox. This turns filtering on.
3. Using the pull-down menu for the Demographic field, select Gender from the list.
4. Using the pull-down menu for the Category field, select M from the list.
5. Click on Estimate with Selected Students. Set the Reset Parameters option to Yes. Click on OK to compute item and population parameters using only the cases that meet the selection criteria.
6. Answer Yes to accept the parameters when prompted.
7. Select the menu option **Reports → Item Reports → Wright Map**.
8. Enter a Title of Wright Map.
9. Browse to the directory you want to store the file in and enter a File name of `wmpf10_males`. Then click on Save.
10. Confirm that the Item Set is set to base (not required for ConstructMap Lite).
11. Set Display Raw Scores is set to Yes.
12. Confirm that Display Item Names is set to No.
13. Set the Show Estimate Type to No.
14. Set the Display Step Map to Yes.
15. In the Defined Range section, confirm that the Max. Range is 5.0, the Min. Range is -5.0, and set the Rows to 45.
16. Click on OK.

    The Wright map will be displayed on the screen and also stored on your system in the folder you specified. Note that "Filters: Gender M included" appears in the heading of the report automatically. In addition to the Wright Map file, the file `tt_wmpf10_males.txt` will be generated automatically and placed in the same folder. This file contains the numeric values of the step thresholds.

17. Select the menu option **Estimation Tasks → Filter Students for DIF Analysis** and change the selected gender category to F. Click on Estimate with Selected Students and say Yes to all dialog prompts.
18. Repeat steps 7 through 16 for females, naming the Wright Map file `wmpf10_females` (which will also automatically generate the `tt_wmpf10_females.txt` file).
19. In Excel, open the file for males that was created above, `tt_wmpf10_males.txt`, by using **File → Open**, and selecting Files of type: All Files (*.*).
20. The Text Import Wizard will be displayed. Select Delimited and select Start import at Row 2, and then click on Next.
21. Verify that the field separator lines are correct and then click on Finish.
22. Save this spreadsheet with the name `dif.xls`. Be sure to change the Save as type to Microsoft Excel Workbook. Do not close the spreadsheet.
23. Open the file for females that you created above, `tt_wmpf10_females.txt`, and import the data as you did above for males.
24. Cut and paste the second two columns from this data into the dif.xls spreadsheet, adjacent to the data for males.
25. Insert a blank column between the first and second columns.
26. Select the first column and go to the menu option **Data → Text to Columns...**.
27. Select "Delimited" and click Next.
28. Add a period (.) as the "other" option and make sure the box is checked. Click Finish. Column B should now hold all the 1s and 2s that indicate the appropriate threshholds.
29. Select all the data and go to the menu option **Data → Sort...**. Select Column B as the column to sort by and click OK.
30. Add a header row with titles such as "Item," "Step," "Male est.," "Male SE," "Female Est.," and

"Female SE" to identify the data.

	A	B	C	D	E	F
1	Item	Step	Male Est.	Male SE	Female Est.	Female SE
2	base:VigAct	1	1.883	0.066	1.469	0.055
3	base:ModAct	1	-1.031	0.074	-1.293	0.055
4	base:Lift	1	-1.945	0.074	-1.539	0.059
5	base:SevStair	1	-0.449	0.066	-0.164	0.051
6	base:OneStair	1	-2.555	0.082	-2.18	0.062
7	base:Bend	1	-1.477	0.066	-1.289	0.055
8	base:WalkMile	1	-0.18	0.07	0.062	0.055
9	base:WalkBlks	1	-0.949	0.084	-0.781	0.066
10	base:WalkOne	1	-2.387	0.102	-2.359	0.078
11	base:Bath	1	-3.219	0.029	-4.18	0.016
12	base:VigAct	2	5.359	0.184	4.859	0.148
13	base:ModAct	2	1.281	0.176	1.43	0.141
14	base:Lift	2	0.625	0.193	1.039	0.145
15	base:SevStair	2	2.367	0.168	2.648	0.137
16	base:OneStair	2	0.141	0.207	0.328	0.152
17	base:Bend	2	1.836	0.18	1.555	0.141
18	base:WalkMile	2	2.023	0.164	2.188	0.129
19	base:WalkBlks	2	0.742	0.18	0.875	0.139
20	base:WalkOne	2	-0.668	0.223	-0.641	0.168
21	base:Bath	2	-1.41	0.176	-2.031	0.148

Figure 2. Sample data from the threshold files, rearranged in an Excel spreadsheet.

31. To create Figures 8.3 and 8.4, create scatter plots using the data in the Male Est. and Female Est. columns. Figure 8.3 uses the data for the first thresholds, and Figure 8.4 uses the data for the second thresholds.

TABLE 8A.2 – TESTING FOR DIF

1. In the spreadsheet you created above, create five new columns. Head them "Female 95% conf. Interval (lower bound)," "Female 95% conf. Interval (upper bound)," "Male 95% conf. Interval (lower bound)," "Male 95% conf. Interval (upper bound)," and "Logit difference."
2. The bounds for a 95% confidence interval are 1.95 standard deviations above and below the point estimate. Enter the appropriate formulas in your new columns. For example, if your data is formatted as above, the first cell in the "Female 95% conf. Interval (lower bound)" column should contain the formula "=E2 – 1.96*F2". Copy these formulas to complete the confidence interval columns of your table.
3. In the "Logit difference" column, enter the formula to subtract the male estimate from the female estimate. Following Figure 2, this would lead to a formula of "=E2-C2" in the first cell of this column.
4. Below your table, write the formulas for computing the average (=AVERAGE(....)) and standard deviation (=STDEV(...)) for female and male confidence intervals.
5. Save the spreadsheet.