

ConstructMap v4.3

Instructions for Generating the Chapter 5 Examples

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FIGURES 5.3 AND 5.4 – RELATIONSHIP BETWEEN RESPONDENT LOCATION (θ) AND PROBABILITY OF A RESPONSE OF “1” FOR AN ITEM WITH DIFFICULTY 1.0.¹

1. Select the menu option **File** → **New Project** and answer “Yes” when asked if you are sure you want to do this.
2. Select the menu option **File – Open – Standard (2 Files)**.
3. Navigate to the pf10_dich folder and open the folder.
4. Select (double click) the file items.txt.
5. Select (double click) the file students.txt.
6. Select the menu option **Reports** → **Report Options**.
7. Enter a Project Title, in this case “PF10 Dichotomous”.
8. Under Student, select Respondent.
9. Click on OK.
10. Select the menu option **File** → **Save**. Click on OK when complete.
11. Select the menu option **Estimation Tasks** → **Compute Item Parameters**.
12. Set Reset Parameters to Yes, and then click on OK.
13. When asked if you want to accept the parameters, click on Yes.
14. Select the menu option **File** → **Save**. Click on OK when complete.
15. Select the menu option **Reports** → **Item Reports** → **Item Characteristic Curves**.
16. Enter a Title of ICC Graph.
17. Use the Browse button to select the WalkMile item.
18. Set the Ability on X-axis value to No.
19. Set the Min. Range to -6 and the Max. Range to 6.
20. Set the Show in Gray Scale option to Yes.
21. Set the Background Color to white.
22. Click on OK.
23. The graph will be displayed. If necessary, drag the right edge of the window to the left to reduce the width of the graph to look more similar to Figure 5.3. Note that ConstructMap displays both the $P(x=0)$ curve (the dashed line) and the $P(x=1)$ curve (the solid line). Click on Close at the bottom of the graph to close the window.
24. To obtain the orientation shown in Figure 5.4, repeat steps 15 and 16, then set the Ability on X-axis value to Yes, and click on OK.
25. Again, the graph will be displayed and if necessary you can drag the bottom edge of the window upwards to reduce the height of the graph to look more similar to Figure 5.4. Note again that ConstructMap displays both the $P(x=0)$ curve (the dashed line) and the $P(x=1)$ curve (the solid line). Click on Close at the bottom of the graph to close the window.

¹ These instructions assume the reader is referring to the Tables and Figures shown in the book.

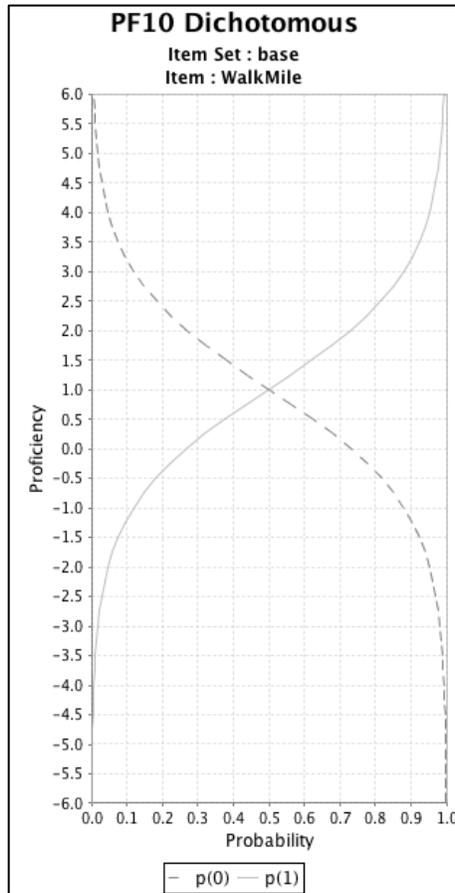


Figure 1. Item Characteristic Curve for item WalkMile from ConstructMap. Item has difficulty of 1.00. Respondent locations are along the y-axis.

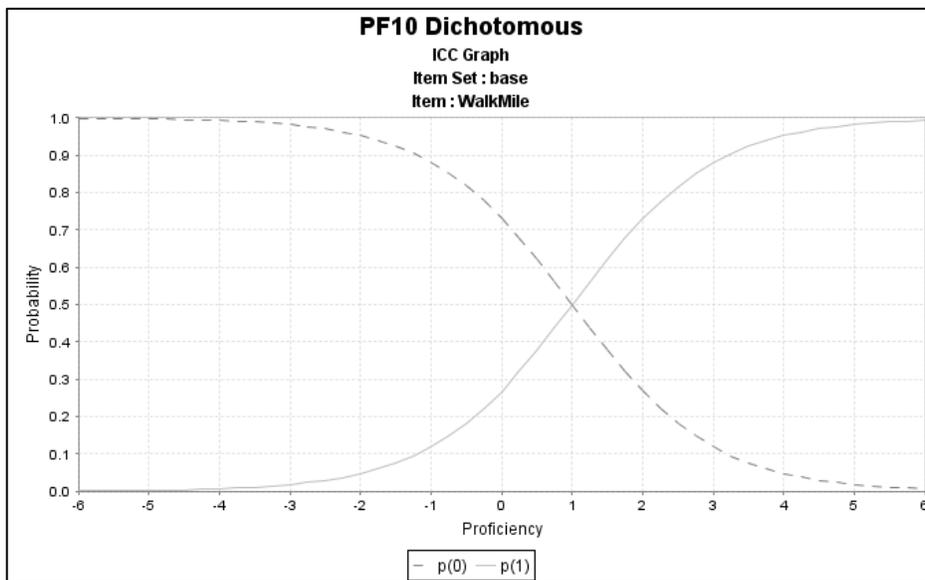


Figure 2. ICC for item WalkMile with respondent locations along the x-axis.

FIGURE 5.7 – A WRIGHT MAP FOR THE DICHOTOMIZED PF-10 INSTRUMENT

1. Continuing from the example above, select **Estimation Tasks** → **Proficiency Estimation Options** and confirm that the Estimation Type is MLE. Click on OK to continue.
2. Select the menu option **Reports** → **Item Reports** → **Wright Map**.
3. Click the first Browse... button to select the directory where you want to store the file (for example, C:/measurement/files). Enter a File name of wmpf10_1, then click on Save.
4. Confirm that the Item Set is set to base (not required for ConstructMap Lite).
5. Set Display Raw Scores to Yes.
6. Set Display Item Names to Yes.
7. Set the Show Estimate Type to No.
8. Confirm that the Display Step Map is set to No.
9. In the Defined Range section, enter the Max. Range as 5.0, the Min. Range as -5.0, and set the Rows to 51.
10. Click on OK.

The Wight map will be displayed on the screen and also stored on your system in the folder you specified. In addition, ConstructMap will automatically store the Thurstonian thresholds in a file named `tt_filename.txt` (the filename you entered in step 16) in the same folder.

11. Close the display by clicking on the close box in the upper right-hand corner.

Note that you can modify the output files generated by ConstructMap. Simply open a file in Word (or any text editor) and modify the content. For example, you can remove header lines, change column headings, etc. by typing right in the file. You may want to save the file with a new name to preserve your original output.

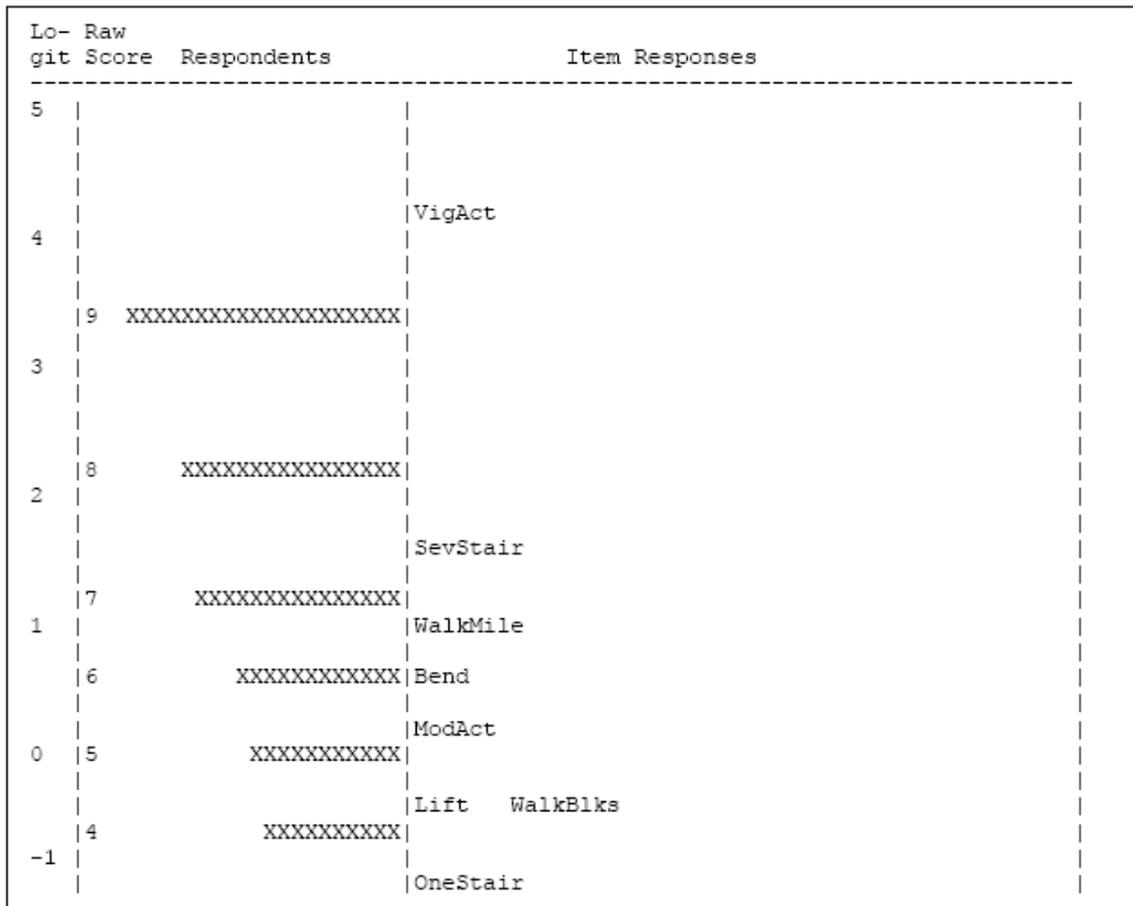


Figure 4. Excerpt of Wright Map from Figure 3 after updating in Word.

FIGURE 5.8 – ITEM RESPONSE FUNCTION FOR $\xi_i=0$ FOR AN ITEM WITH DIFFICULTY 1.0.

1. This curve is already displayed in Figure 1 from ConstructMap. It is the dashed line.

FIGURE 5.9 – THE CUMULATIVE CATEGORY RESPONSE FUNCTIONS FOR A POLYTOMOUS ITEM.

1. Select the menu option **File** → **New Project**. Click OK on the dialog box that appears.
2. Select the menu option **File** → **Open** → **Standard (2 Files)**.
3. Navigate to the pf10_trich folder and open the folder.
4. Select (double click) the file items.txt.
5. Select (double click) the file students.txt.
6. Select the menu option **Reports** → **Report Options**.
7. Enter a Project Title, in this case "PF10 Trichotomous".
8. Under Student, select Respondent.
9. Click on OK.
10. Select the menu option **File** → **Save**. Click on OK when complete.
11. Select the menu option **Estimation Tasks** → **Compute Item Parameters**.

12. Set Reset Parameters to Yes, then click on OK.
13. When asked if you want to accept the parameters, click on Yes.
14. Select the menu option **File** → **Save**. Click on OK when complete
15. Select the menu option **Reports** → **Item Reports** → **Item Cumulative Probability Curves**.
16. Enter a Title of Cumulative Probability.
17. Use the Browse... button to select (double click) the WalkMile item.
18. Set the Ability on X-axis value to No.
19. Set the Min. Range to -6 and the Max. Range to 6.
20. Set the Show in Gray Scale option to Yes.
21. Set the Background Color to white.
22. Click on OK.
23. The graph will be displayed. If needed, drag the right edge of the window to the left to reduce the width of the graph to look more similar to Figure 5.9. Click on OK to close the graph window.

Note that ConstructMap displays cumulative probabilities such that the first curve is the probability of being in score category 1 or higher (denoted as $P(1,2)$ in the legend), the second curve is the probability of being in score category 2 or higher, etc. (in this case, there were only 3 categories, with scores 0, 1 and 2). Note in the chart produced by ConstructMap that at an ability level of 0 the respondent is more likely to have a score of 1 than a score of 2. The probability of having a score of 1 or 2 is 0.5, while the probability of having a score of 2 is 0.05.

The representation in Figure 5.9 in the book is the reverse. The first curve is the probability of being in score category 0, the second is the probability of being in score categories 0 or 1.

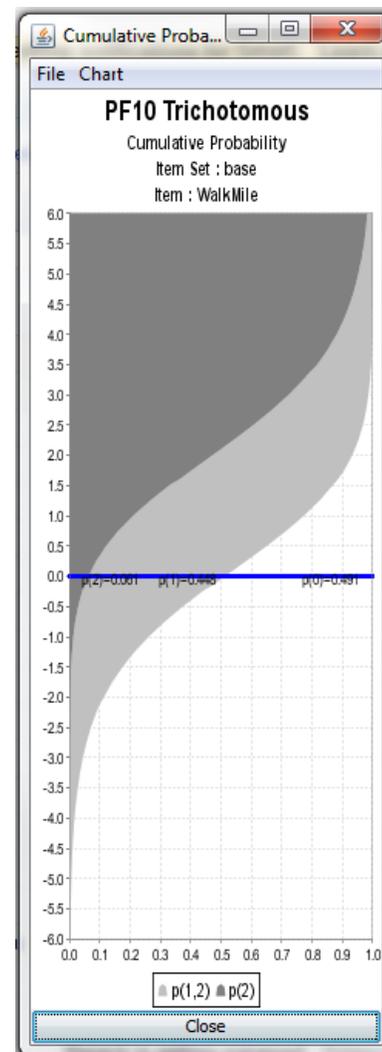


Figure 5. Item Cumulative Probability Curves for a polytomous item. Respondent locations along the y-axis.

FIGURE 5.10 – A WRIGHT MAP FOR THE TRICHOTOMOUS PF-10 INSTRUMENT

1. Select the menu option **Reports** → **Item Reports** → **Wright Map**.
2. Click on the first Browse... button to browse to the directory you want to store the file in. Enter a File name of `wmpf10_2`, then click on Save.
3. Confirm that the Item Set is set to base (not required for ConstructMap Lite).
4. Set Display Raw Scores to Yes.
5. Set Display Item Names to Yes.
6. Set the Show Estimate Type to No.
7. Confirm that the Display Step Map is set to No.
8. In the Defined Range section, set the Max. Range to 5.5, the Min. Range to -4.5, and set the Rows to 50.
9. Click on OK.

The Wright map will be displayed on the screen and also stored on your system in the folder you specified. Again, ConstructMap will automatically store the Thurstonian thresholds in a file named `tt_filename.txt` (the filename you entered in step 2) in the same folder.

By default, ConstructMap displays all the item threshold labels in one column. To get the map shown in Figure 5.10:

- Change the column headings and remove the extra rows as noted for Figure 5.7 above (do not delete the ".1"s and ".2"s from the item labels yet!)
- Add column headings for "0 vs 1&2" and "0&1 vs 2" within the Item Responses column
- Align all of the .2 step labels into the "0&1 vs 2" column
- Remove the ".1"s and ".2"s from the item labels
- Remove the rows above 5 and below -4.

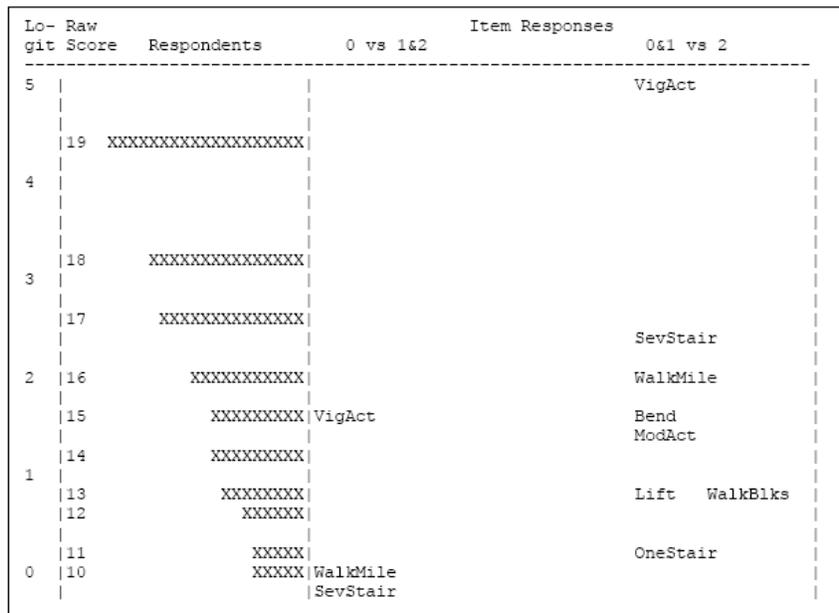


Figure 7. Excerpt of the Wright Map from Figure 6 after updating in Word.