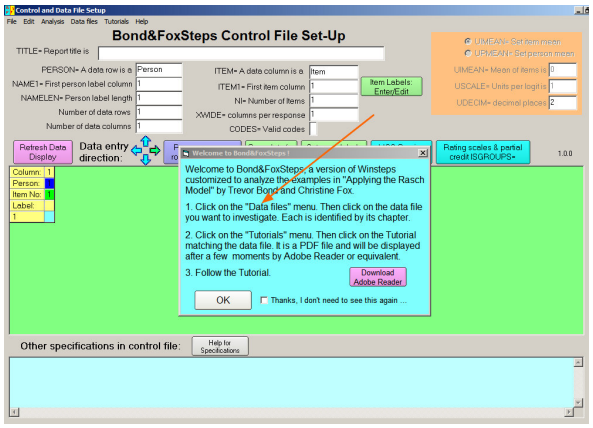
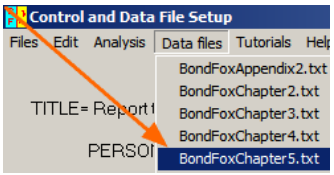
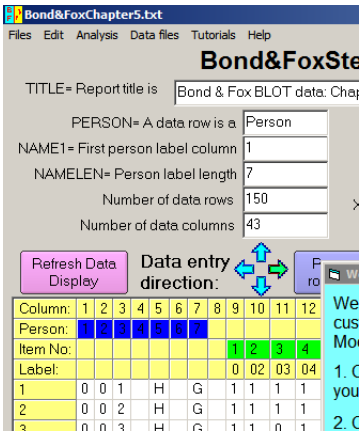
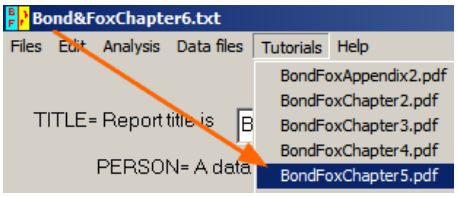
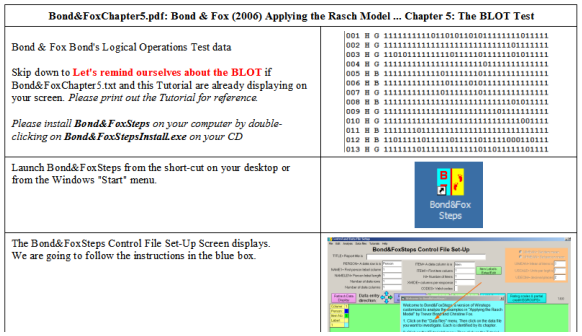
Bond&FoxChapter5.pdf: Bond & Fox (2006) Applying the Rasch Model ... Chapter 5: The BLOT Test	
Bond & Fox Bond's Logical Operations Test data Skip down to **Let's remind ourselves about the BLOT** if Bond&FoxChapter5.txt and this Tutorial are already displaying on your screen. *Please print out the Tutorial for reference.* *Please install **Bond&FoxSteps** on your computer by double-clicking on **Bond&FoxStepsInstall.exe** on your CD*	001 H G 11111111110110101101011111111011111 002 H G 11111111111111111111111111101111111 003 H G 11010111111111011111011111101011111 004 H G 11111111111111111111101111111111111 005 H B 11111111111101111111011111111111111 006 H B 11111111111111011101011111111111111 007 H G 11111111111101111111011111111111111 008 H B 11111111111111111111111111101011111 009 H G 11111111111111111111111101111111111 010 H G 11111111111111111111111111001111111 011 H B 11111110111111111111111111111111111 012 H B 11011111011111011111011111000110111 013 H G 11111110111111111111011011111101111
Launch Bond&FoxSteps from the short-cut on your desktop or from the Windows "Start" menu.	
The Bond&FoxSteps Control File Set-Up Screen displays. We are going to follow the instructions in the blue box.	
Click on the "Data files" menu. Click on Bond&FoxChapter5.txt	
The Bond&FoxChapter5.txt control instructions and data are displayed on your screen.	

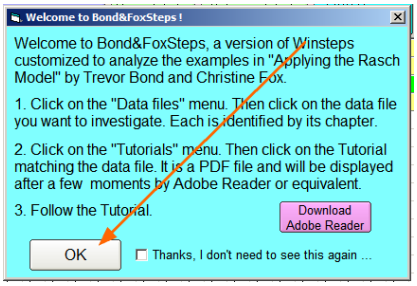
Click on the "Tutorials" menu.
Click on " Bond&FoxChapter5.pdf" - this is the Tutorial matching Bond&FoxChapter5.txt



This PDF file displays. It is what you are reading now. *Please print out the Tutorial for reference.*



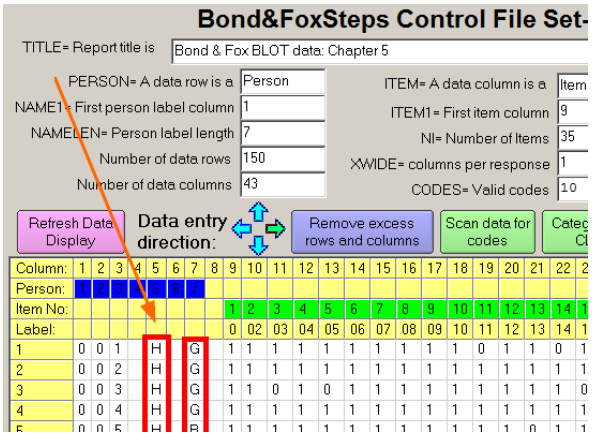
Now step-by-step through this Tutorial ...
Click "OK" on the Welcome dialog



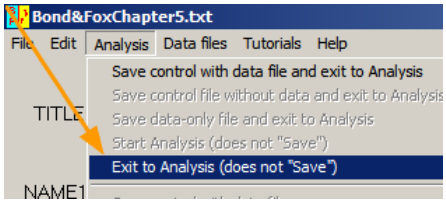
Let's remind ourselves about the BLOT. It consists of 35 multiple-choice items administered to 150 persons. Each answer is then scored 1 ifcorrect, 0 if it does not.

Bond & Fox allocate each person to an ability group: raw scores of 0-26 are the Low group. 27-35 are the High group. H and L are coded in column 5 of the person label.

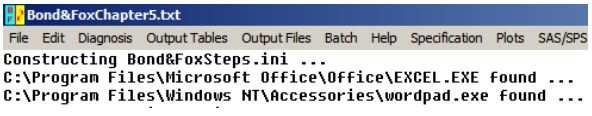
The children's genders are also indicated: B=Boy, G=Girl, x=unknown.



Let's perform the H Analysis of these data.
Click on "Analysis" menu
Click on "Exit to Analysis (does not Save)"
- we don't want to make any changes at this point ...

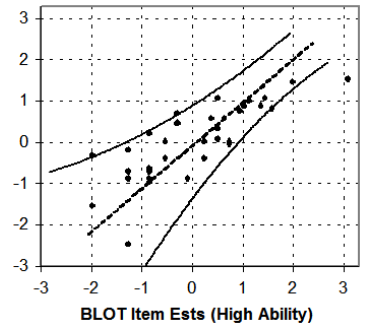


File Setup closes, and the Analysis phase begins. If this is the first time you have run an Analysis, it checks your computer for available resources ....



Bond & Fox Fig. 5.1 is a scatterplot of the item difficulties for the low ability children plotted against the item difficulties for the high ability children.

So we need to do two analyses: first for the high ability children, then for the low ability children.



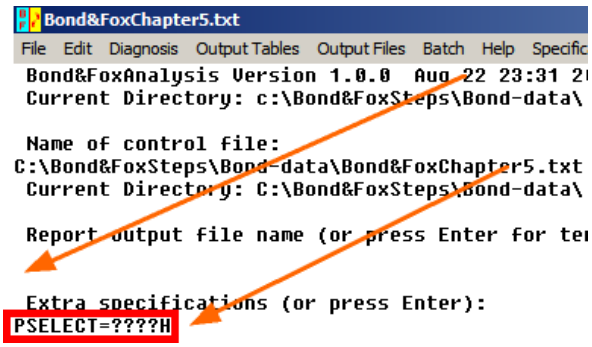
This is the analysis for the High Ability children.

Bond&FoxSteps - Analysis phase - correctly reports that the analysis control file is Bond&FoxChapter5.txt.

"Report output file name"?
Press your Enter key

"Extra specifications"?
Type in:
PSELECT=????H *(you can copy-and-paste if you want)*
Press your Enter key

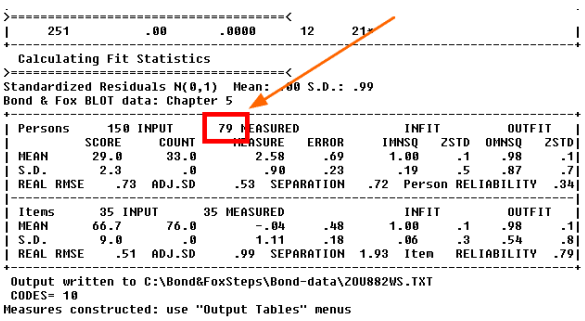
This specifies: "Only analyze records with H in column 5 of the person label"



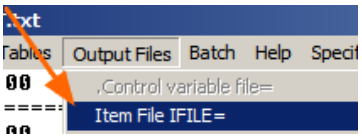
The BLOT data are Rasch-analyzed.

Measures (person abilities, item difficulties) are constructed.

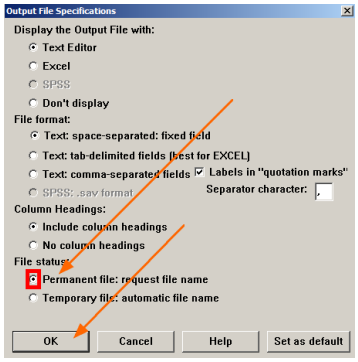
Note that only 79 measures have been estimated. These are the 79 high ability, H, children.

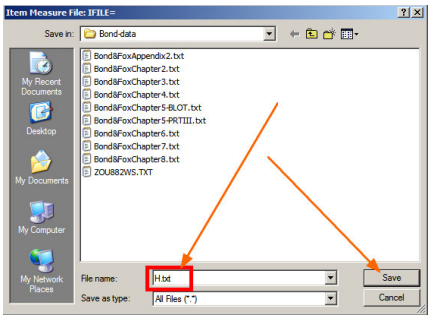
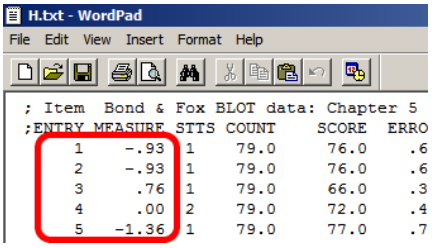
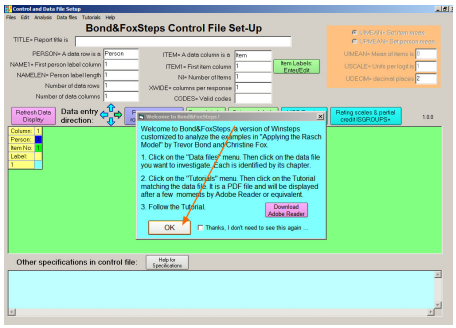
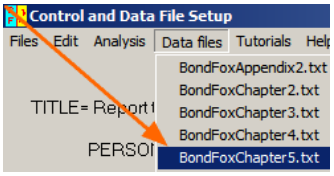
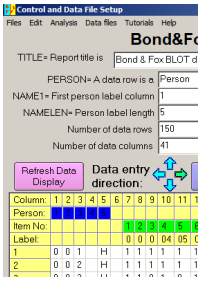
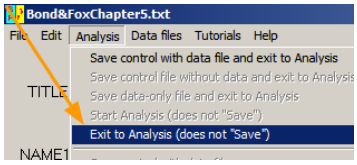


Let's save the item difficulties from this H analysis in to a file called "H.txt"
Click on "Output Files" menu
Click on "Item File IFILE="



"Output File Specifications"?
Most options are correctly pre-selected
Click on "Permanent file: specify file name"
Click on "OK"



"Item Measure File: IFILE="? "File name:" Type in H.txt Click on "Save"	
WordPad displays file "H.txt". The first two columns are crucial. They show the item entry number and the measure (item difficulty) for each item. This is all we need from the H analysis.	
Close all open and output windows	☒
Now for the analysis of the low ability, L, children. Launch Bond&FoxSteps from the short-cut on your desktop or from the Windows "Start" menu.	
The Bond&FoxSteps Control File Set-Up Screen displays. Click on "OK" to close the blue "Welcome" box	
Click on the "Data files" menu. Click on Bond&FoxChapter5.txt	
The Bond&FoxChapter5.txt control instructions and data are displayed on your screen.	
Let's perform the H Analysis of these data. Click on "Analysis" menu Click on "Exit to Analysis (does not Save)" - we don't want to make any changes at this point ...	

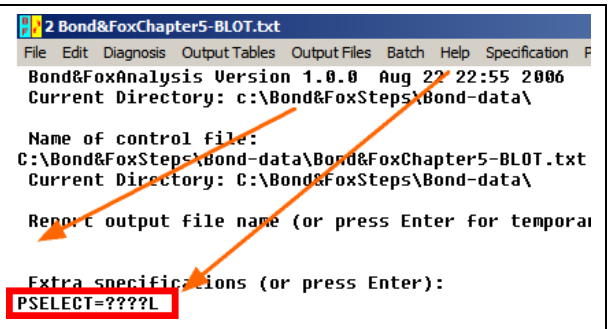
This is the analysis for the Low Ability children.

Bond&FoxSteps - Analysis phase - correctly reports that the analysis control file is Bond&FoxChapter5.txt.

"Report output file name"?
Press your Enter key

"Extra specifications"?
Type in:
PSELECT=????L *(you can copy-and-paste if you want)*
Press your Enter key

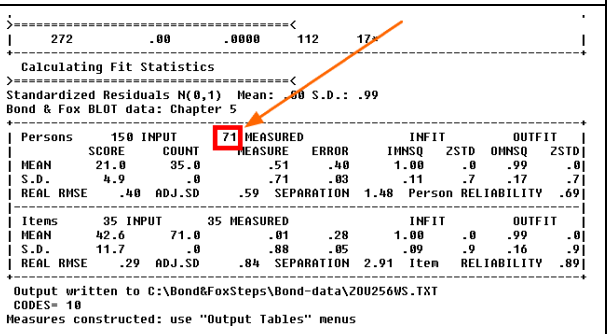
This specifies: "Only analyze records with L in column 5 of the person label"



The BLOT data are Rasch-analyzed.

Measures (person abilities, item difficulties) are constructed.

Note that only 71 measures have been estimated. These are the 71 low ability, H, children.



Let's take a look at the item difficulty estimates.
Click on "Output Tables"
Click on "14. Item: entry"

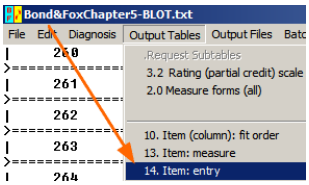
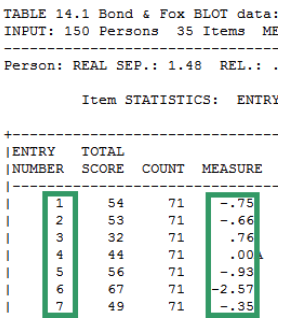
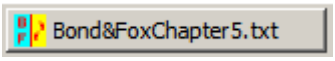


Table 14 displays. It shows the item difficulties for the low ability children.

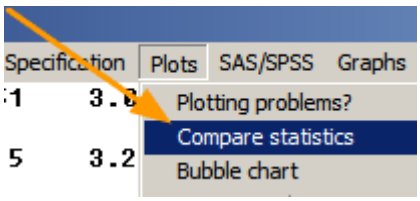


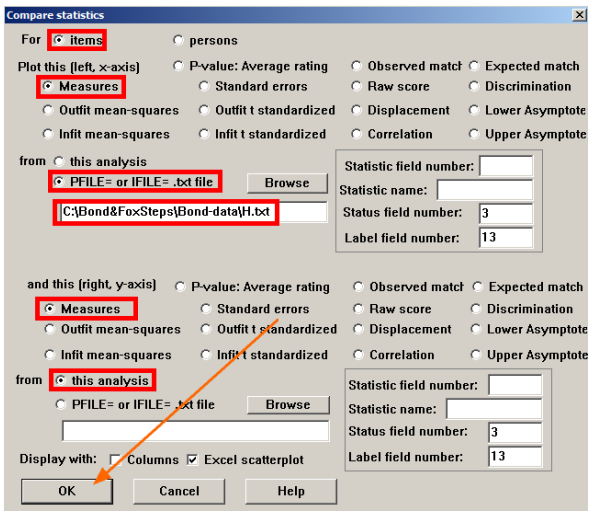
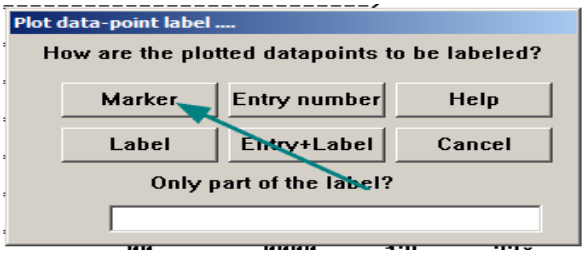
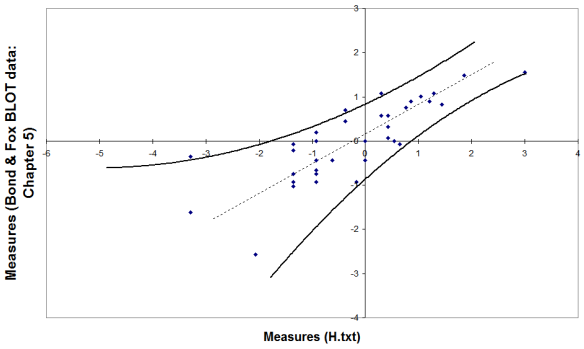
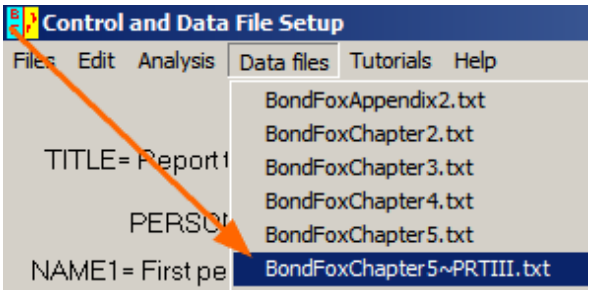
Return to then Analysis screen. Click on " Bond&FoxChapter5.txt" on the Windows Taskbar.

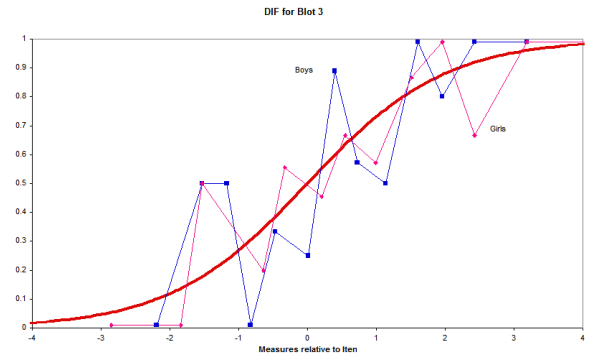
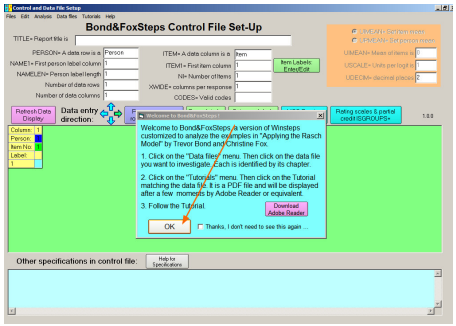
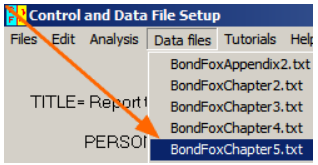
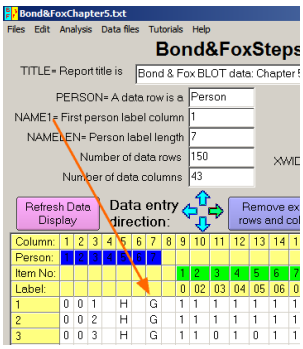
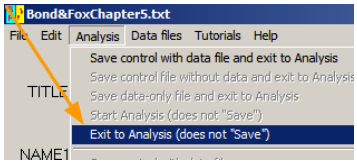


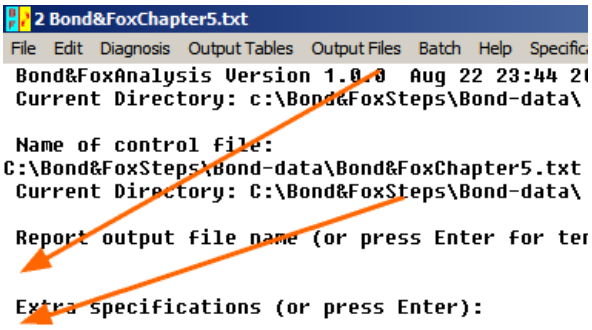
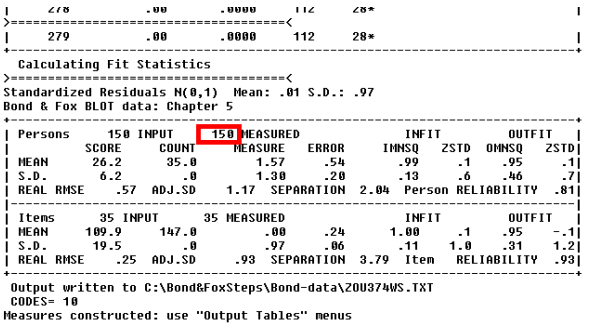
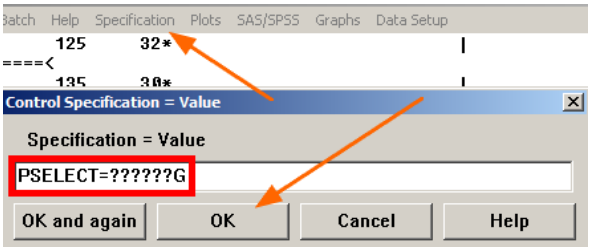
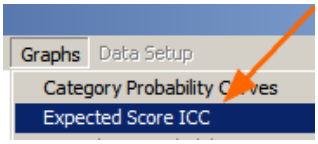
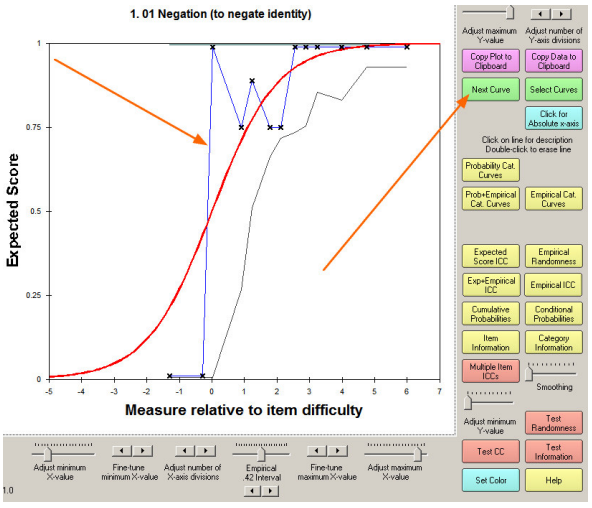
Now we have the item difficulties for both sets of children. The those for the high ability children are in file "H.txt". Those for the low ability children have now been estimated.

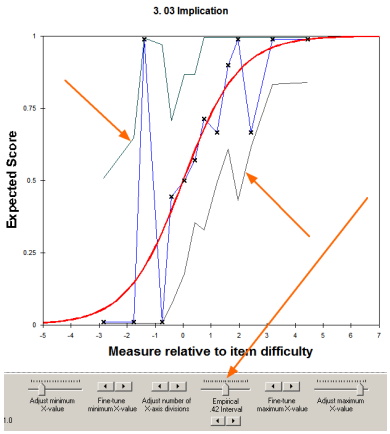
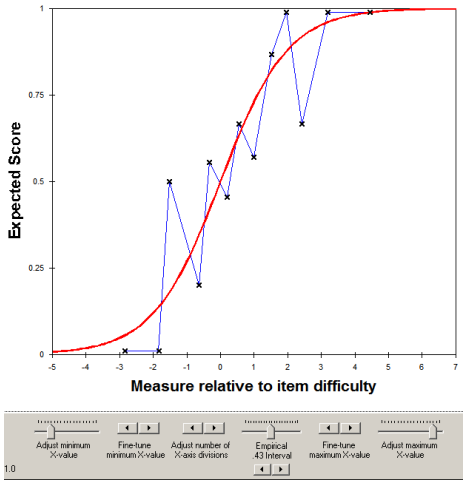
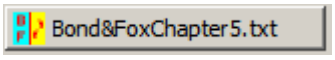
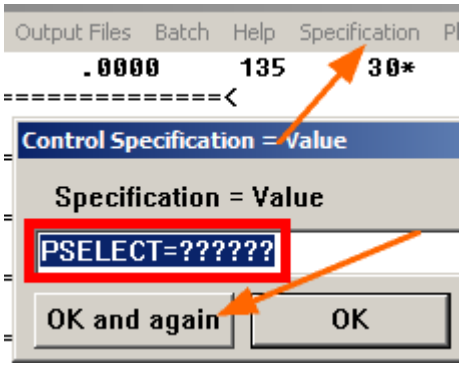
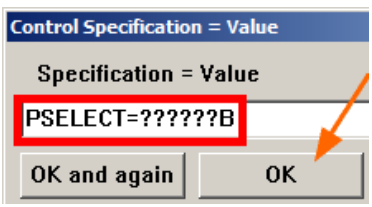
Click on "Plots" menu
Click on "Compare statistics"

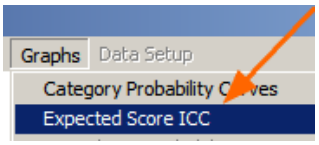
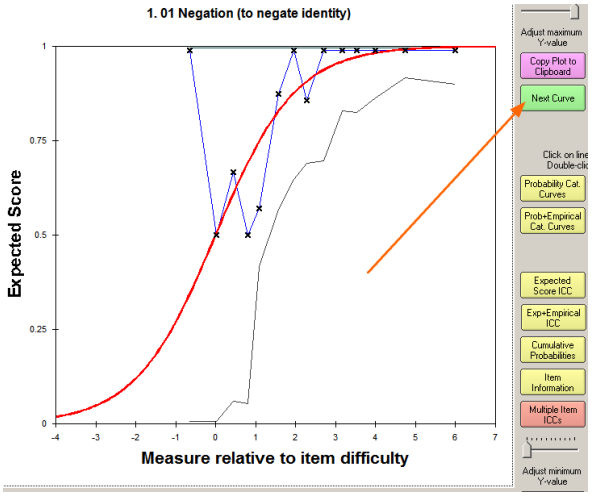
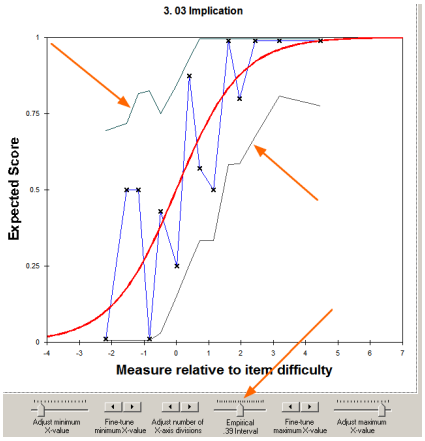
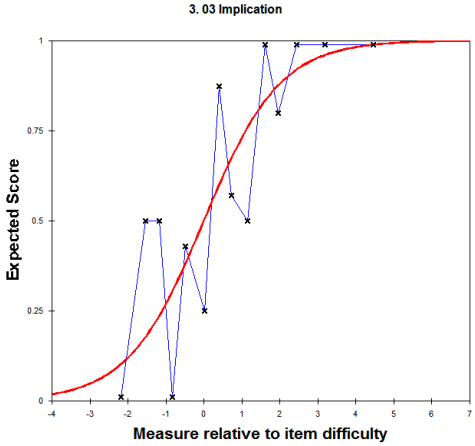


On the "Compare statistics" screen, For "persons" The x-axis in Fig 5.1 is from the High Ability analysis. Click on "Measures" Click on "PFILE=" Type in "H.txt" or use the "Browse" button to find ***H.txt*** The y-axis is from the current Low Ability analysis. Click on "Measures" Click on "this analysis" and "measures" Click on "OK"	
"Plot data-point label ...." Label with "Marker" like Fig. 5.1	
After some number crunching, the Excel plot displays .... The curved lines are the 95% confidence intervals. Each black point is an item. There is agreement with Fig. 5.1	
Close all open and output windows	☒
Bond & Fox Chapter 5 focuses on Invariance. The examples come from the BLOT data set, Rasch analyzed and compared in a variety of ways. You should now have enough experience to attempt those yourself. The Excel spreadsheet from Chapter 5 is on the accompanying CD as well. The Bond&FoxSteps Control and Data file for the PRTIII is in Bond&FoxChapter5~PRTIII.txt	
Close all open and output windows	☒

Toward the end of Chapter 5 is Fig. 5.10. This shows the performance of the boys and the girls on the BLOT items. Let's find this out for ourselves.	
Launch Bond&FoxSteps from the short-cut on your desktop or from the Windows "Start" menu.	
The Bond&FoxSteps Control File Set-Up Screen displays. Click on "OK" to close the blue "Welcome" box	
Click on the "Data files" menu. Click on Bond&FoxChapter5.txt	
The Bond&FoxChapter5.txt control instructions and data are displayed on your screen. Gender is in column 7 of the person label.	
Let's analyze these data: Click on "Analysis" menu Click on "Exit to Analysis (does not Save)" - we don't want to make any changes at this point ...	

We want to analyze all the children. Bond&FoxSteps - Analysis phase - correctly reports that the analysis control file is Bond&FoxChapter5.txt. "Report output file name"? Press your Enter key "Extra specifications"? Press your Enter key	
The BLOT data are Rasch-analyzed. Measures (person abilities, item difficulties) are constructed for all 150 children.	
Now let's look at the performance of the Girls on each item. Click on "Specification" menu Type into the Specification box **PSELECT=??????G** Click on "OK"	
Your Analysis screen shows that 79 girls were selected	PSELECT=??????G Persons SELECTED: 79
Now lets look at the girls' behavior on each item. Click on "Graphs" menu Click on "Expected Score ICC"	
The empirical item characteristic curve (jagged blue line) displays. This shows the performance of the Girls on item 1. Click on "Next Curve" twice to advance to item #3	

Let's look at item 3, it is one the items in Bond & Fox Fig. 5.10 Nudge the left "Empirical interval" until the blue line matches the Girls line for item 3 in Fig. 5.10. The value is .43 Double-click on the grey-green lines to remove them.	
Here is the Girls' performance on Item 3. As Bond & Fox remark, their performance tracks the Rasch expectation, the red line.	
Now for the Boys. Click on "Bond&FoxChapter5.txt" on the Windows Taskbar	
Click on "Specification Menu" Type into the "Specification = Value" box **PSELECT=??????** Click on "OK and again"	
The "Specification" box remains on screen. On your Analysis screen it says 150. Everyone has been reinstated.	PSELECT=?????? Persons SELECTED: 150
Type into the "Specification = Value" box **PSELECT=??????B** Click on "OK"	
On your Analysis screen it says 68. Only the boys.	PSELECT=??????B Persons SELECTED: 68

Now lets look at the boys' behavior on each item. Click on "Graphs" menu Click on "Expected Score ICC"	
This shows the performance of the Boys on item 1. Click on "Next Curve" twice to advance to item #3	
Let's look at item 3, it is one the items in Bond & Fox Fig. 5.10 Nudge the left "Empirical interval" until the blue line matches the Boys line for item 3 in Fig. 5.10. The value is .40 Double-click on the grey-green lines to remove them.	
Here is the Boys' performance on Item 3. As Bond & Fox remark, their performance tracks the Rasch expectation, the red line. You can follow the same procedure to examine non-uniform DIF on all of the items. There are several techniques for putting the Boys' line and the Girls' line on the same plot. A. You can click on "Copy Data to Clipboard" and then paste into Excel. Do this for both the Girls and the Boys. Then use Excel graphing functions. B. You can use a technique in Help *"DIF item characteristic curves for non-uniform DIF for non-uniform DIF"*	
Close all open and output windows	☒