

Bond&FoxChapter3.pdf: Bond & Fox (2006) Applying the Rasch Model ... Chapter 3: Ersatz Data

Bond's Ersatz data.

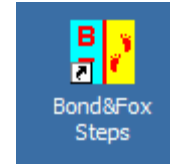
Skip down to **Let's remind ourselves about the Ersatz data** if Bond&FoxChapter3.txt and this Tutorial are already displaying on your screen. *Please print out the Tutorial for reference.*

*Please install **Bond&FoxSteps** on your computer by double-clicking on **Bond&FoxStepsInstall.exe** on your CD*

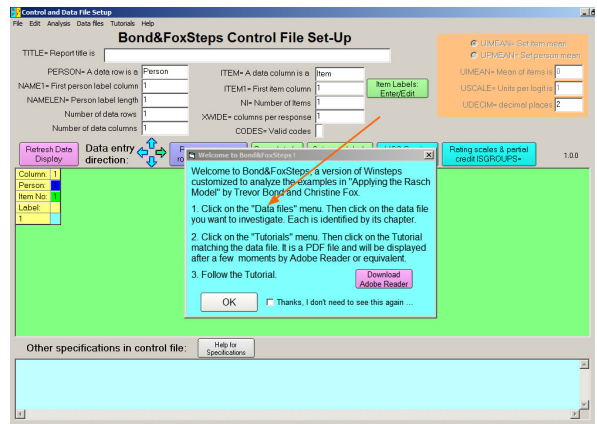
```

Bill  011111101111111
Betty 010111111111111
Bob   001010001111111
Jean  000101000110100
Jack  001110011111101
Jill  000001001011011
Mike  000000000011000
    
```

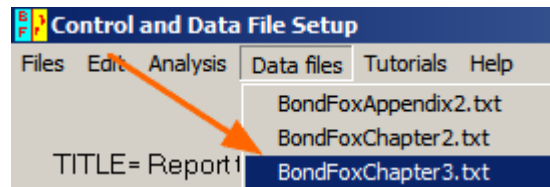
Launch Bond&FoxSteps from the short-cut on your desktop or from the Windows "Start" menu.



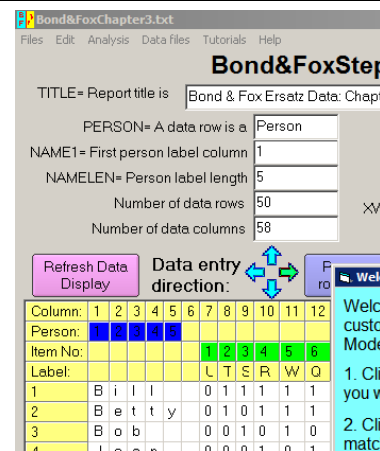
The Bond&FoxSteps Control Data File Set-Up Screen displays. We are going to follow the instructions in the **blue box**.



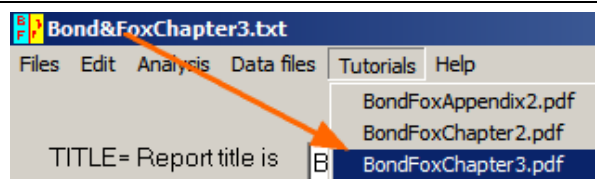
1. Click on the "Data files" menu. Click on "Bond&FoxChapter3.txt" - this is the Chapter 3 example



The Bond&FoxChapter3.txt control instructions and data are displayed on your screen.



Click on the "Tutorials" menu. Click on " Bond&FoxChapter3.pdf" - this is the Tutorial matching Bond&FoxChapter3.txt



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

Bond & FoxChapter3.pdf: Bond & Fox (2006) Applying the Rasch Model ... Chapter 3: Ersatz Data

Bond's Ersatz data.

Bill	01111101111111
Betty	01011111111111
Bob	00101000111111
Jean	00010100011010
Jack	00111001111101
Jill	00001001010101
Mike	00000000011001

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.

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

Welcome to Bond&FoxSteps!

Welcome to Bond&FoxSteps, a version of Winsteps customized to analyze the examples in "Applying the Rasch Model" by Trevor Bond and Christine Fox.

- Click on the "Data files" menu. Then click on the data file you want to investigate. Each is identified by its chapter.
- Click on the "Tutorials" menu. Then click on the Tutorial matching the data file. It is a PDF file and will be displayed after a few moments by Adobe Reader or equivalent.
- Follow the Tutorial.

Download Adobe Reader

OK Thanks, I don't need to see this again ...

Let's remind ourselves about the Ersatz data. This is data simulated to match the description in Chapter 3. It consists of the score performance of 50 children on 52 items of development. The items are scored 1 for succeeded and 0 for not yet succeeded.

In the data file, notice that the first 7 children lists are those of interest to us. And also that the first 12 items are also those of interest to us.

Bond&FoxSteps Control File Set-Up

TITLE= Report title is Bond & Fox Ersatz Data: Chapter 3

PERSON= A data row is a Person

NAME1= First person label column 1

NAMELEN= Person label length 5

Number of data rows 50

Number of data columns 58

ITEM= A data column is a Item

ITEM1= First item column 7

NI= Number of Items 52

XWIDE= columns per response 1

CODES= Valid codes 01

Refresh Data Display | Data entry direction: | Remove excess rows and columns | Scan data for codes | Category labels CLFILE= | MCQ Scoring KEY1=

Column:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Person:	B	i	l	l	i																									
Item No:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Label:	L	T	S	R	W	O	P	O	V	N	M	L																		
1	B	i	l	l	i																									
2	B	e	t	t	y																									
3	B	o	b																											
4	J	e	a	n																										
5	J	a	c	k																										
6	J	i	l																											
7	M	i	k	e																										

Let's perform the 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 ...

Bond&FoxChapter3.txt

Files Edit Analysis Data files Tutorials Help

Save control with data file and exit to ...

Save control file without data and ex ...

Save data-only file and exit to Analy ...

Start Analysis (does not "Save")

Exit to Analysis (does not "Save")

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&FoxChapter3.txt

File Edit Diagnosis Output Tables Output Files Batch Help Specification Plots SAS/SPSS

Constructing Bond&FoxSteps.ini ...

C:\Program Files\Microsoft Office\Office\EXCEL.EXE found ...

C:\Program Files\Windows NT\Accessories\wordpad.exe found ...

Bond&FoxSteps - Analysis phase - correctly reports that the analysis control file is Bond&FoxChapter3.txt.

"Report output file name" ?
Press your Enter key

"Extra specifications" ?
Press your Enter key

Bond&FoxAnalysis Version 1.0.0 Aug 25 0:23 21

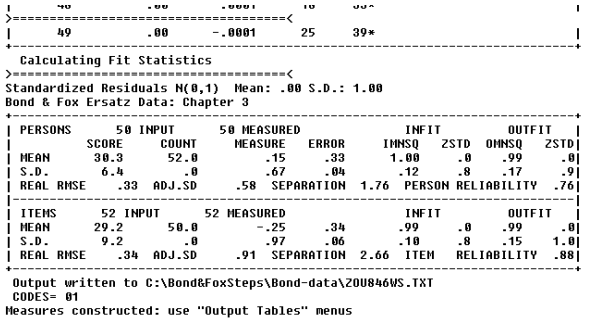
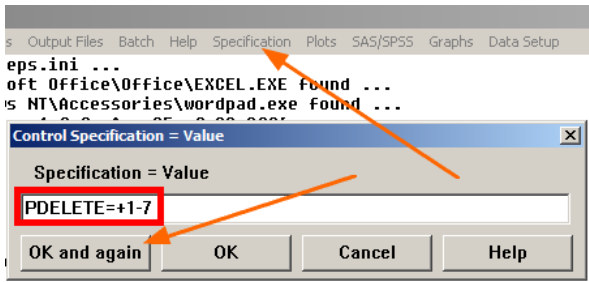
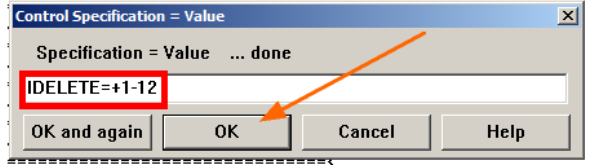
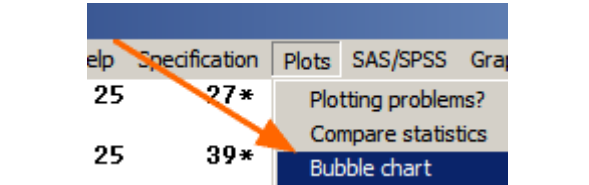
Current Directory: c:\Bond&FoxSteps\Bond-data\

Name of control file: C:\Bond&FoxSteps\Bond-data\Bond&FoxChapter3.txt

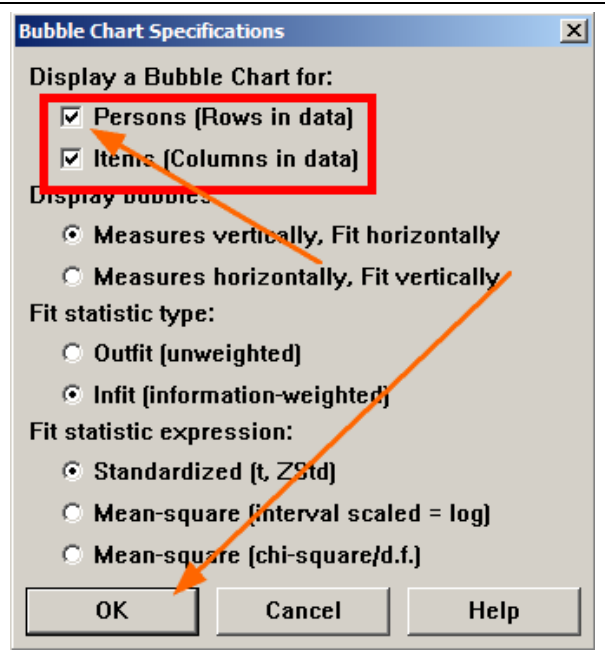
Current Directory: C:\Bond&FoxSteps\Bond-data\

Report output file name (or press Enter for ter ...)

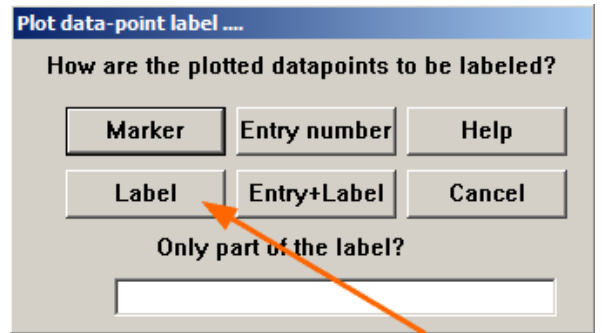
Extra specifications (or press Enter):

<p>The BLOT data are Rasch-analyzed.</p> <p>Measures (person abilities, item difficulties) are constructed.</p>	 <p>Calculating Fit Statistics Standardized Residuals N(0,1) Mean: .00 S.D.: 1.00 Bond & Fox Ersatz Data: Chapter 3</p> <table border="1"> <thead> <tr> <th>PERSONS</th> <th>50 INPUT</th> <th>50 MEASURED</th> <th>INFINIT</th> <th>OUTFIT</th> </tr> </thead> <tbody> <tr> <td>MEAN</td> <td>30.3</td> <td>52.0</td> <td>.15</td> <td>.33</td> </tr> <tr> <td>S.D.</td> <td>6.4</td> <td>.0</td> <td>-.67</td> <td>.04</td> </tr> <tr> <td>REAL RHSE</td> <td>.33</td> <td>ADJ.SD</td> <td>.58</td> <td>SEPARATION</td> </tr> </tbody> </table> <p>Output written to C:\Bond&FoxSteps\Bond-data\200846WS.TXT CODES= 01 Measures constructed: use "Output Tables" menus</p>	PERSONS	50 INPUT	50 MEASURED	INFINIT	OUTFIT	MEAN	30.3	52.0	.15	.33	S.D.	6.4	.0	-.67	.04	REAL RHSE	.33	ADJ.SD	.58	SEPARATION
PERSONS	50 INPUT	50 MEASURED	INFINIT	OUTFIT																	
MEAN	30.3	52.0	.15	.33																	
S.D.	6.4	.0	-.67	.04																	
REAL RHSE	.33	ADJ.SD	.58	SEPARATION																	
<p>We want to focus on the first seven children</p> <p>Click on "Specification" menu</p> <p>Type into the "Specification = value" box: PDELETE=+1-7 (you may copy-and-paste this)</p> <p>Click on "OK and again"</p> <p>This deletes everyone except children 1 to 7 from being reported.</p>	 <p>Control Specification = Value</p> <p>Specification = Value</p> <p>PDELETE=+1-7</p> <p>OK and again OK Cancel Help</p>																				
<p>Your Analysis reports that only 7 children will be reported.</p>	<p>PDELETE=+1-7 CURRENTLY REPORTABLE PERSONS = 7</p>																				
<p>We also want to focus on the first 12 items.</p> <p>Type into the "Specification = value" box: IDDELETE=+1-12 (you may copy-and-paste this)</p> <p>Click on "OK"</p>	 <p>Control Specification = Value</p> <p>Specification = Value ... done</p> <p>IDDELETE=+1-12</p> <p>OK and again OK Cancel Help</p>																				
<p>Your Analysis reports that only 12 items will be reported.</p>	<p>IDDELETE=+1-12 CURRENTLY REPORTABLE ITEMS = 12</p>																				
<p>Bond & Fox Figure 3.1 Pathway Bubble chart</p> <p>Click on "Plots" menu</p> <p>Click on "Bubble chart"</p>	 <p>elp Specification Plots SAS/SPSS Gra</p> <p>25 27*</p> <p>25 39*</p> <p>Plotting problems? Compare statistics Bubble chart</p>																				

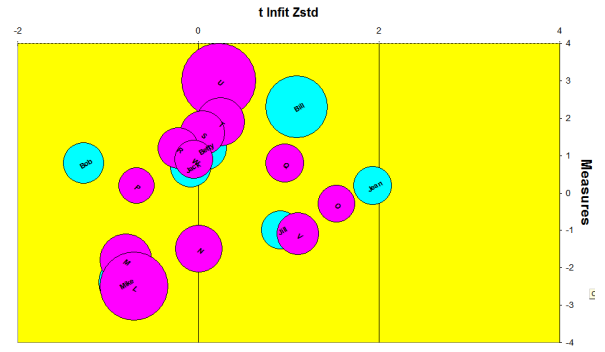
"Bubble Chart Specifications":
 Most of the options are correctly pre-selected.
 Click on "Persons"
 Click "OK"



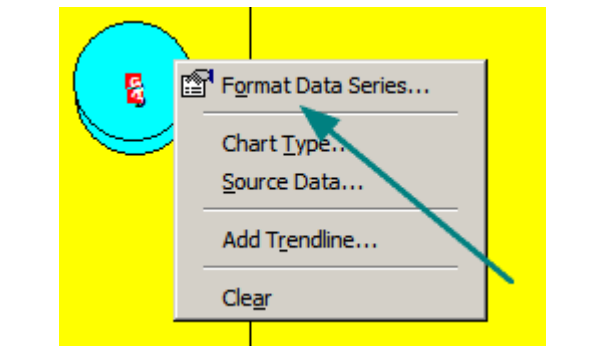
"Plot data-point label ..."?
 Click on "Label"



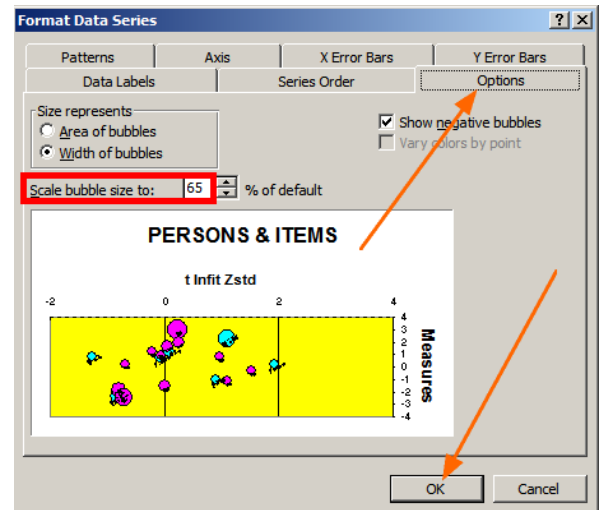
After a little delay, the Excel plot displays.
 The bubbles are located vertically by measure and horizontally by fit.
 The bubbles are too large. The diameter of each bubble should be twice the measure standard error. The biggest bubble should have a diameter of about 1.2 logits according to Table 14 (soon to come).
 Let's use the Excel functions to correct the plot.



Right click on any bubble.
 Click on "Format Data Series" (not "Format Data Labels" or "Format Data Points")
 If "Format Data Series" does not display, move the mouse a little lower down in the bubble and right-click again.



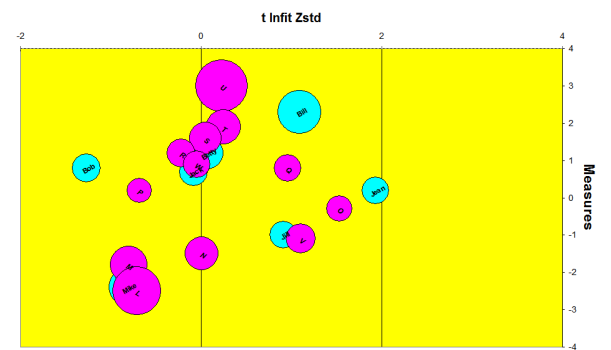
"Options" tab
 "Scale bubble size to:" Type in "65"
 Click on "OK"



And we see a much better looking pathway. The diameter of the biggest bubble is about 1.2 logits (vertically).

This is now your plot. You can beautify it using all the Excel functions.

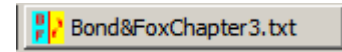
See Bond & Fox Chapter 3 for an explanation of this.



Close windows at any time - you can always get them again!



You can quickly get back to the Analysis by clicking on "Bond&FoxChapter3.txt" on the Windows Taskbar



Let's look at analysis details for the developmental items. There are several Tables that present this same information in different ways. We can follow the authors by looking at a parallel of their **Bond & Fox Table 3.1 Item difficulty** listing.

Click on the "Output Tables" pull-down menu
 Click on "13. ITEM: Measure".

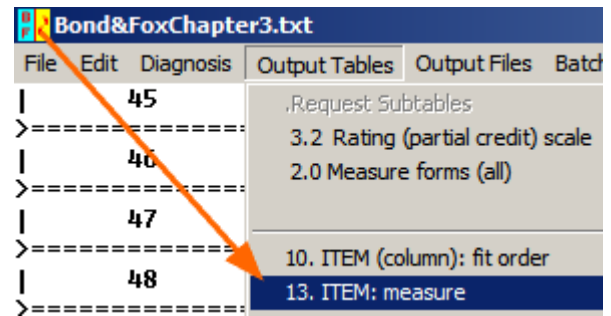


Table 13.1 is displayed by WordPad. It shows the item statistics: scores, measures, standard errors and fit statistics.

It approximates Bond & Fox Table 3.1 but is not exactly the same because this is a different dataset.

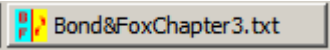
"ZSTD" corresponds to "t". ZSTD means "Standardized like a z-statistic", i.e., a t-statistic with infinite degrees of freedom. So, for practical purposes, "t" and "z" statistics are equivalent.

TABLE 13.1 Bond & Fox Ersatz Data: Chapter 3 200846WS.TXT Aug 25 0:23 2006
 INFUT: 50 PERSONS 52 ITEMS MEASURED: 7 PERSONS 12 ITEMS 2 CATS Bond&FoxAnalysis
 PERSON: REAL SEP.: 1.76 REL.: .76 ... ITEM: REAL SEP.: 2.66 REL.: .88

ITEM STATISTICS: MEASURE ORDER

ENTRY NUMBER	RAW SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	OUTFIT ZSTD	PTMEA	EXACT MATCH	DISPLACE	ITEM
1	3	50	3.00	.59	1.03	.72	1.21	.51	-.02	94.0
2	9	50	1.20	.39	1.04	.18	1.07	.31	-.26	84.0
3	10	50	1.60	.36	1.00	-.11	.99	.11	.21	82.0
4	14	50	1.20	.39	.96	-.12	.91	-.41	.35	74.0
5	19	50	.90	.31	.99	.00	.95	-.31	.39	64.0
6	19	50	.80	.31	1.11	1.00	1.14	.91	.15	68.0
7	23	50	.20	.25	.95	-.07	.92	-.71	.35	66.0
8	29	50	-.30	.30	1.14	1.65	1.31	2.21	.06	58.0
9	35	50	-1.10	.34	1.20	1.11	1.25	1.01	.22	72.0
10	40	50	-1.50	.38	.98	.00	.86	-.41	.43	82.0
11	46	50	-1.80	.42	.76	-.08	.71	-.71	.04	90.0
12	48	50	-2.50	.54	.67	-.07	.75	-.31	-.04	96.0

You can quickly get back to the Analysis by clicking on "Bond&FoxChapter3.txt" on the Windows Taskbar



Let's look at analysis details for the children.
 Click on the "Output Tables" pull-down menu
 Click on "17. PERSON: Measure".

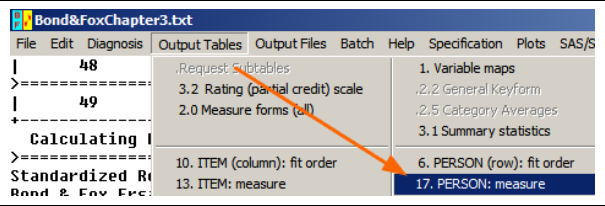


Table 17.1 is displayed by WordPad. It shows the statistics for the children: measures, standard errors and fit statistics.
 It approximates Bond & Fox Table 32 but is not exactly the same because this is a different dataset.
 "ZSTD" corresponds to "t". ZSTD means "Standardized like a z-statistic", i.e., a t-statistic with infinite degrees of freedom. So, for practical purposes, "t" and "z" statistics are equivalent.

TABLE 17.1 Bond & Fox Ersatz Data: Chapter 3 200846NS.TXT Aug 25 0:23 2006
 INPUT: 50 PERSONS 52 ITEMS MEASURED: 7 PERSONS 12 ITEMS 2 CATS Bond&FoxAnalysis

PERSON: REAL SEP.: 1.76 REL.: .76 ... ITEM: REAL SEP.: 2.66 REL.: .88

PERSON STATISTICS: MEASURE ORDER

ENTRY	RAW	MODEL	INFIT	OUTFIT	PTMEA	EXACT	MATCH											
NUMBER	SCORE	COUNT	MEASURE	S.E.	(MNSQ	ZSTD)	(MNSQ	ZSTD)	CORR.	OBS#	EXP#	(DISPLAC	PERSON					
1	45	52	2.30	.49	1.39	1.1	1.31	.7	.27	88.5	90.6	-.38	Bill					
2	42	52	1.20	.36	1.00	.1	.91	-.2	.29	82.7	80.1	.22	Betty					
3	42	52	.80	.33	.81	-1.3	.73	-1.2	.39	84.6	74.9	.62	Bob					
5	37	52	.70	.33	.98	-1	.91	-.3	.39	71.2	73.6	.10	Jack					
4	27	52	.20	.31	1.23	1.9	1.43	2.2	.22	59.6	67.4	-.38	Jean					
6	20	52	-1.00	.31	1.11	.9	1.09	.5	.31	67.3	70.2	.18	Jill					
7	6	52	-2.40	.43	.77	-.8	.72	-.4	.36	90.4	86.6	-.19	Mike					

Close all open and output windows

