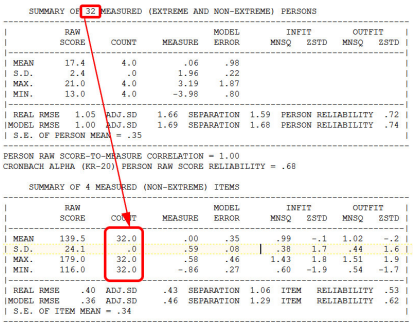
Winsteps 3.65.0 Enhancements and Bug Fixes - April 2008

Enhancements to Tables and Plots

1. Cosmetic: Table 1 etc. - MAP - positioned better

```
KIDS - MAP - ACTS
  <more>|<rare>
M Ro  +
F Fa  |
```

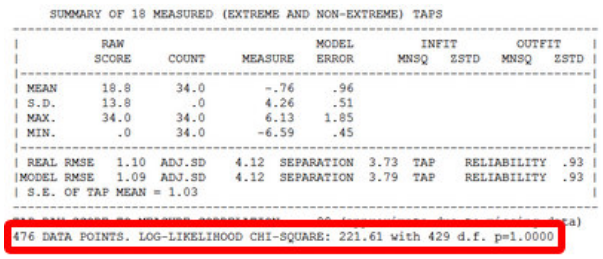
2. Tables 3.1, Table 28, Table 29
Include extreme persons in item summary, and extreme items in person summary



```
SUMMARY OF 32 MEASURED (EXTREME AND NON-EXTREME) PERSONS
|          RAW                          MODEL          INFIT        OUTFIT   |
|         SCORE     COUNT     MEASURE   ERROR      MNSQ   ZSTD    MNSQ   ZSTD |
| MEAN     17.4       4.0         .06     .98                                 |
| S.D.      2.4        .0        1.96     .22                                 |
| MAX.     21.0       4.0        3.19    1.87                                 |
| MIN.     13.0       4.0       -3.98     .80                                 |
| REAL RMSE  1.05  ADJ.SD  1.66  SEPARATION  1.59  PERSON RELIABILITY  .72    |
|MODEL RMSE  1.00  ADJ.SD  1.69  SEPARATION  1.68  PERSON RELIABILITY  .74    |
| S.E. OF PERSON MEAN = .35                                                   |
PERSON RAW SCORE-TO-MEASURE CORRELATION = 1.00
CRONBACH ALPHA (KR-20) PERSON RAW SCORE RELIABILITY = .68

SUMMARY OF 4 MEASURED (NON-EXTREME) ITEMS
|          RAW                          MODEL          INFIT        OUTFIT   |
|         SCORE     COUNT     MEASURE   ERROR      MNSQ   ZSTD    MNSQ   ZSTD |
| MEAN    139.5      32.0         .00     .35       .99   -.1    1.02   -.2  |
| S.D.     24.1        .0         .59     .08       .38    1.7    .44    1.6  |
| MAX.    179.0      32.0         .58     .46      1.43    1.8   1.51    1.9  |
| MIN.    116.0      32.0        -.86     .27       .60   -1.9    .54   -1.7  |
| REAL RMSE   .40  ADJ.SD   .43  SEPARATION  1.06  ITEM   RELIABILITY  .53    |
|MODEL RMSE   .36  ADJ.SD   .46  SEPARATION  1.29  ITEM   RELIABILITY  .62    |
| S.E. OF ITEM MEAN = .34                                                     |
```

3. Table 3.1
Log-likelihood chi-square displayed with degrees of freedom and probability.



```
SUMMARY OF 18 MEASURED (EXTREME AND NON-EXTREME) TAPS
|          RAW                          MODEL          INFIT        OUTFIT   |
|         SCORE     COUNT     MEASURE   ERROR      MNSQ   ZSTD    MNSQ   ZSTD |
| MEAN     18.8      34.0        -.76     .96                                 |
| S.D.     13.8        .0        4.26     .51                                 |
| MAX.     34.0      34.0        6.13    1.85                                 |
| MIN.      .0       34.0       -6.59     .45                                 |
| REAL RMSE   1.10  ADJ.SD   4.12  SEPARATION  3.73  TAP    RELIABILITY  .93  |
|MODEL RMSE   1.09  ADJ.SD   4.12  SEPARATION  3.79  TAP    RELIABILITY  .93  |
| S.E. OF TAP MEAN = 1.03                                                     |
476 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 221.61 with 429 d.f. p=1.0000
```

4. Cosmetic: Table 3.2 duplicative word "ITEM" removed

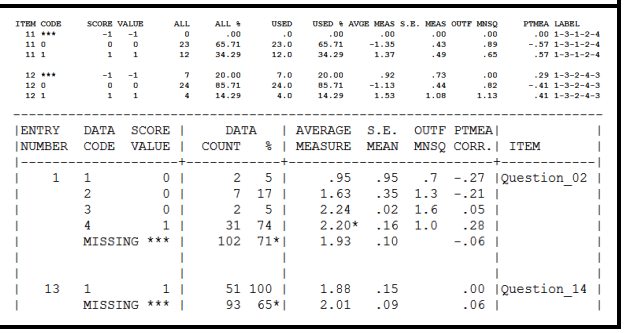
```
SUMMARY OF CATEGORY STRUCTURE.  Model="R"
FOR GROUPING "0" ACT NUMBER: 1  WATCH BIRDS

ACT ITEM DIFFICULTY MEASURE OF -.89 ADDED TO MEASURES
+-------------------------------------------------------------
|CATEGORY   OBSERVED|OBSVD SAMPLE|INFIT OUTFIT||STRUCT
|LABEL SCORE COUNT %|AVRGE EXPECT|  MNSQ  MNSQ||CALIBR
|-------------------+------------+------------++------
|  0    0       3   4|  -.96  -.44|   .74    .73||  NONE
```

5. Table 6, Table 10 and all measure Tables.
Corrected summary statistics for mean and standard deviation when TOTALSCORE=YES.

```
+---------------------
|ENTRY   TOTAL
|NUMBER  SCORE  COUNT
|---------------------
|     1      7     18
.........
|    34     11     18
|    35     12     18
|---------------------
| MEAN     6.7   14.0
| S.D.     2.4     .0
+---------------------
```

6. TABLE 14.3 & DISFILE=
Additional "VALUE" column for recounted responses.
Percentages based on relevant responses (non-missing or all).
Correlations: Responses scored 'Missing' are correlated with all responses. Responses scored 0-254 are correlated with responses scores 0-254.



```
ITEM CODE     SCORE VALUE     ALL    ALL %     USED    USED % AVGE MEAS S.E. MEAS OUTF MNSQ     PTMEA LABEL
  11 ***         -1  -1        0      .00       .0      .00      .00      .00      .00      .00 .00 1-3-1-2-4
  11 0            0   0       23    65.71     23.0    65.71    -1.35     .43      .89     -.57 1-3-1-2-4
  11 1            1   1       12    34.29     12.0    34.29     1.37     .49      .65      .57 1-3-1-2-4

  12 ***         -1  -1        7    20.00      7.0    20.00      .92     .73      .00      .29 1-3-2-4-3
  12 0            0   0       24    85.71     24.0    85.71    -1.13     .44      .82     -.41 1-3-2-4-3
  12 1            1   1        4    14.29      4.0    14.29     1.53    1.08     1.13      .41 1-3-2-4-3

|ENTRY   DATA  SCORE |     DATA     | AVERAGE  S.E.  OUTF PTMEA|                |
|NUMBER  CODE  VALUE |   COUNT   %  | MEASURE  MEAN  MNSQ CORR.| ITEM           |
|     1     1      0 |      2   5   |     .95   .95    .7  -.27 |Question_02     |
|           2      0 |      7  17   |    1.63   .35   1.3  -.21 |                |
|           3      0 |      2   5   |    2.24   .02   1.6   .05 |                |
|           4      1 |     31  74   |   2.20*   .16   1.0   .28 |                |
|        MISSING *** |    102  71*  |    1.93   .10     -.06    |                |
|                    |              |                           |                |
|                    |              |                           |                |
|    13     1      1 |     51 100   |    1.88   .15     .00     |Question_14     |
|        MISSING *** |     93  65*  |    2.01   .09     .06     |                |
```

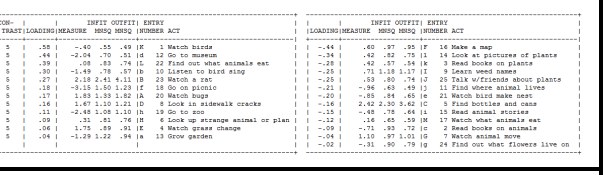
7.

Table 23 and Table 24:
Improved variance decomposition table:
1. based on raw residuals
2. includes person and item variances

```
        STANDARDIZED RESIDUAL VARIANCE SCREE PLOT
Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)
                                          Empirical           Modeled
Total raw variance in observations =      49.5 100.0%          100.0%
Raw variance explained by measures =      35.5  71.7%           71.1%
Raw variance explained by persons  =      11.7  23.6%           23.4%
Raw Variance explained by items    =      23.9  48.2%           47.7%
Raw unexplained variance (total)   =      14.0  28.3% 100.0%     28.9%
Unexplned variance in 1st contrast =       2.7   5.5%  19.5%
Unexplned variance in 2nd contrast =       2.4   4.8%  17.0%
Unexplned variance in 3rd contrast =       1.8   3.6%  12.6%
Unexplned variance in 4th contrast =       1.7   3.4%  12.1%
Unexplned variance in 5th contrast =       1.2   2.4%   8.4%
```

8.

Bug fix: Table 23 and Table 24:
PCA - two column format correction



9.

Tables 27 and 28, summary statistics for extreme+non-extreme and extreme only measures.
PSUBTOTAL=
ISUBTOTAL=

EXTREME AND NON-EXTREME SCORES

TAP COUNT	MEASURE	S.E. MEAN	OBSERVED S.D.	MEDIAN	REAL SEPARATION	CODE
18	-.76	1.03	4.26	-1.96	3.73	*
13	-.34	1.20	4.17	.79	3.91	1
3	-4.00	1.45	2.05	-3.83	1.42	2
1	-3.38	-	.00	-3.38	.00	3
1	6.13	-	.00	6.13	.00	4

UMEAN=0 USCALE=1

NON-EXTREME SCORES ONLY

TAP COUNT	MEASURE	S.E. MEAN	OBSERVED S.D.	MEDIAN	REAL SEPARATION	CODE
14	.00	.97	3.48	-.39	4.41	*
11	.80	1.10	3.49	1.95	4.24	1
2	-2.70	1.13	1.13	-2.70	1.52	2
1	-3.38	-	.00	-3.38	.00	3

UMEAN=0 USCALE=1

10.

Table 30, Table 31, Table 33
Bug fix: DIF, DPF, DGF: estimation convergence adjustment to allow for more precise DIF significance estimates (t-values).

```
Processing: DIF=@GENDER
 Building list of classification codes ...
 Computing DIF sizes: one bar per iteration...
>=====================================<
 Iteration 1: Largest change = .47 units
>=====================================<
 Iteration 2: Largest change = .40 units
>=====================================<
 Iteration 3: Largest change = .32 units
```

11.

Table 30, Table 31, Table 33
Bug fix: Table-line sort-order resolved

30 **Differential Item Function across Person classifications**
30.1 DIF report (paired), controlled by DIF=
30.2 DIF report (measure list: person class within item)
30.3 DIF report (measure list: item within person class)
30.4 DIF report (item-by-person class chi-squares)

12.

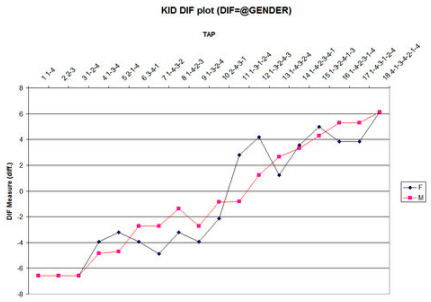
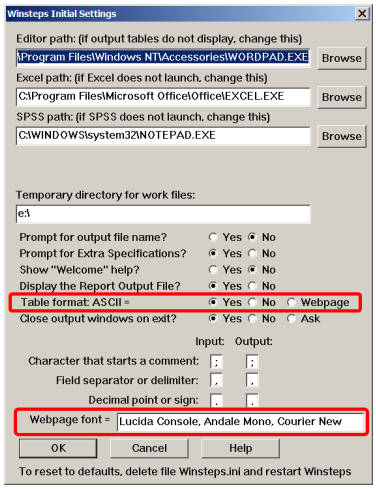
Table 30, Table 31, Table 33. Probability computations improved.
1. Persons with extreme scores on the instrument. These are omitted from the DIF investigation.

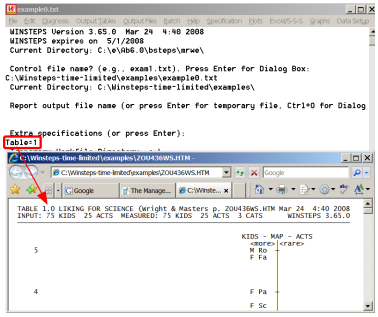
2. Groups of persons with extreme scores on an item (e.g., all girls succeed on item 3). These are included in the DIF investigation. They are indicated by < (zero score) or > (perfect score) after the estimate.

Previously, the user could select these behaviors, but experience has shown that these settings make the most sense.

DIF class specification is: DIF=@GENDER

KID CLASS	OBSERVATIONS COUNT	AVERAGE	EXPECT	BASELINE MEASURE	DIF SCORE	DIF MEASURE	DIF SIZE	DIF S.E.	DIF t	DIF Prob.	TAP Number	Name
F	18	1.00	1.00	-6.59	.00	-6.59	.00	.00	.00	1.000	1	1-4
F	18	1.00	1.00	-6.59	.00	-6.59	.00	.00	.00	1.000	2	2-3
F	18	1.00	1.00	-6.59	.00	-6.59	.00	.00	.00	1.000	3	1-2-4
F	18	.89	.92	-4.40	-.03	-3.93	.48	.89	.54	.5976	4	1-3-4
F	18	.83	.88	-3.83	-.05	-3.22	.61	.79	.78	.4474	5	2-1-4
F	18	.89	.85	-3.38	.04	-3.93	-.55	.89	-.62	.5464	6	3-4-1
F	18	.94	.88	-3.83	.06	-4.88	-1.05	1.07	-.98	.3414	7	1-4-3-2
F	18	.83	.75	-2.35	.09	-3.22	-.87	.78	-1.11	.2838	8	1-4-2-3
F	18	.89	.85	-3.38	.04	-3.93	-.55	.89	-.62	.5464	9	1-3-2-4
F	18	.72	.65	-1.57	.08	-2.15	-.58	.67	-.86	.4014	10	2-4-3-1
F	18	.06	.28	.79	-.22	2.79	2.00	.78	2.55	.0214	11	1-3-1-2-4
F	18	.00	.13	2.24	-.13	4.19<	1.96	1.11	1.76	.0981	12	1-3-2-4-3

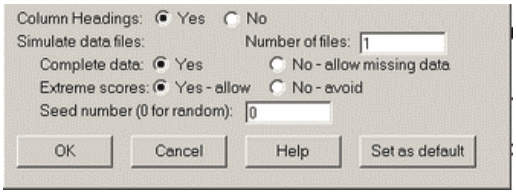
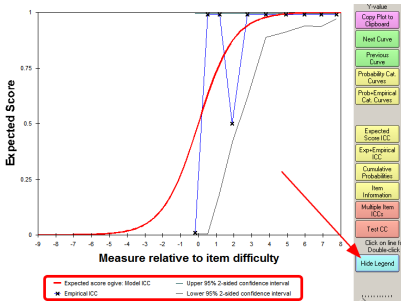
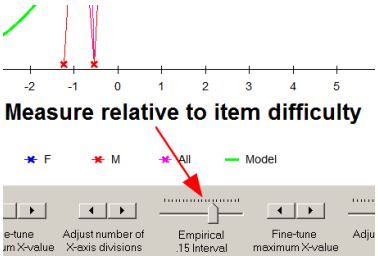
13.	Plots: DIF, DPF, DGF plot titles revised to match Tables 30, 31, 33.	
14.	Table 32: ";SDELQU=" so that Table 32 can be pasted directly into a new control file	SCFILE = ;SDELQU= N SDFILE = SFILE =
	Output Table Display improved	
15.	ASCII = No, Yes, Webpage for better Output Table display with supporting webpage fonts and adjustments to Winsteps.ini	
16.	Ascii = Yes, with font Courier New	TABLE 3.1 LIKING FOR SCIENCE (Wright & Masters p. ZOU436WS.HTM Mar 24 4:40 2008 INPUT: 75 KIDS 25 ACTS MEASURED: 75 KIDS 25 ACTS 3 CATS WINSTEPS 3.65.0 SUMMARY OF 74 MEASURED (NON-EXTREME) KIDS | RAW MODEL INFIT OUTFIT | | SCORE COUNT MEASURE ERROR MNSQ ZSTD MNSQ ZSTD | | MEAN 31.4 25.0 .90 .39 .99 -.2 1.08 .1 | | S.D. 8.4 .0 1.22 .10 .50 1.6 1.04 1.9 | | MAX. 49.0 25.0 4.82 1.03 3.15 5.4 5.16 6.8 | | MIN. 12.0 25.0 -1.61 .34 .29 -3.9 .20 -3.0 | | REAL RMSE .43 ADJ.SD 1.14 SEPARATION 2.67 KID RELIABILITY .88 | |MODEL RMSE .40 ADJ.SD 1.15 SEPARATION 2.88 KID RELIABILITY .89 | | S.E. OF KID MEAN = .14 | MAXIMUM EXTREME SCORE: 1 KIDS
17.	Ascii=No, with font Letter Gothic (installed with Winsteps)	TABLE 3.1 LIKING FOR SCIENCE (Wright & Masters p. ZOU436WS.HTM Mar 24 4:40 200 INPUT: 75 KIDS 25 ACTS MEASURED: 75 KIDS 25 ACTS 3 CATS WINSTEPS 3.65. SUMMARY OF 74 MEASURED (NON-EXTREME) KIDS RAW MODEL INFIT OUTFIT SCORE COUNT MEASURE ERROR MNSQ ZSTD MNSQ ZSTD MEAN 31.4 25.0 .90 .39 .99 -.2 1.08 .1 S.D. 8.4 .0 1.22 .10 .50 1.6 1.04 1.9 MAX. 49.0 25.0 4.82 1.03 3.15 5.4 5.16 6.8 MIN. 12.0 25.0 -1.61 .34 .29 -3.9 .20 -3.0 REAL RMSE .43 ADJ.SD 1.14 SEPARATION 2.67 KID RELIABILITY .88 MODEL RMSE .40 ADJ.SD 1.15 SEPARATION 2.88 KID RELIABILITY .89 S.E. OF KID MEAN = .14
18.	Ascii=Webpage, with font Lucida Console (Andale Mono is installed with Winsteps) HTML file displayed with your Internet Browser	SUMMARY OF 74 MEASURED (NON-EXTREME) KIDS RAW MODEL INFIT OUTFIT SCORE COUNT MEASURE ERROR MNSQ ZSTD MNSQ ZSTD MEAN 31.4 25.0 .90 .39 .99 -.2 1.08 .1 S.D. 8.4 .0 1.22 .10 .50 1.6 1.04 1.9 MAX. 49.0 25.0 4.82 1.03 3.15 5.4 5.16 6.8 MIN. 12.0 25.0 -1.61 .34 .29 -3.9 .20 -3.0 REAL RMSE .43 ADJ.SD 1.14 SEPARATION 2.67 KID RELIABILITY .88 MODEL RMSE .40 ADJ.SD 1.15 SEPARATION 2.88 KID RELIABILITY .89 S.E. OF KID MEAN = .14

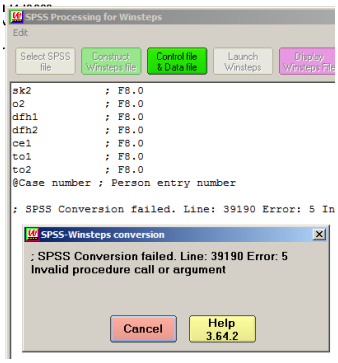
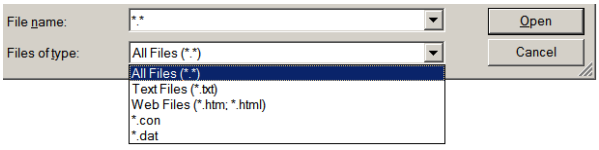
19.	Automatically display output Table on estimation completion if requested in the Control file or Extra specifications.	
	Control Variable enhancements	

20.	CUTLO= and CUTHI= now allow complete response strings and are compatible with USCALE=	`| 3 74 25 3 4.83 3.92 .2511`
		`| DROPPING OUT OF RANGE OBSERVATIONS. CUTLOW= 10.00 CUTHIGH= 10.00`
		`>=======================================<`
		`| 1458 OBSERVATIONS DROPPED`

21.	Bug fix: processing of GROUPS=123 and GROUPS=* corrected at the DOS prompt or Extra Specifications	Could cause a crash

22.	IWEIGHT=
	now allows all items to be weighted=0 when a person is anchored.
		`NI=10`
		`IWEIGHT=*`
		`1-10 0 ; ALL ITEMS WEIGHTED 0`
		`*`
		`PAFILE=*`
		`1 2.45 ; PERSON IS ANCHORED`
		`*`

23.	Bug fix: MAKEKEY= now allows blank codes	MAKEKEY = " "
24.	SIFILE= simulation has more control variables, supporting batch processing: SICOMPLETE = for complete or matching data pattern SIEXTREME= allow extreme scores to be simulated SINUMBER= number of simulated data files to produce SISEED= seed number for random number generator	
	Graphing	
25.	Graphing: button to display Legend on graphs	
26.	Bug fix: Graphing: inoperative non-uniform DIF slider corrected.	
	Data importing and File handling	

27.	Revised Welcome dialog to include Excel/S-S-S	
28.	Excel/S-S-S dialog box	
29.	Bug fix: SPSS input file conversion. Prevent failure if nothing after the selected fields in the field selection box.	
30.	Dialog box filters: corrected to make more meaningful listing of suffixes	
	Winsteps Help	
31.	Help file in Windows Vista-compatible HTMLHelp ".chm" format. Now 400+ pages.	