

Host

Notes

Output Created		12-JUL-2026 20:07:43
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output" mkdir "D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output"'] .
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.15

Host

Notes

Output Created		12-JUL-2026 20:07:43
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save" mkdir "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.17

Host

Notes

Output Created		12-JUL-2026 20:07:44
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\spv" mkdir "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\spv"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.37

Host

Notes

Output Created		12-JUL-2026 20:07:44
Comments		
Input	Active Dataset	DataSet0
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		HOST COMMAND=['cmd /c if not exist "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\p df" mkdir "D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\p df"'].
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.26

Bowker's Test of Symmetry

Bowker's Test of Symmetry
Import paired data

Bowker Variable Preparation

Bowker Variable Preparation
Create common Low, Medium, and High categories for G1 and G3

Paired Category Frequencies

Paired Category Frequencies
Before and after grade-band distributions

Frequencies

Notes

Output Created		12-JUL-2026 20:07:45
Comments		
Input	Data	D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\sav\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=bowker_before bowker_after /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

[BowkerData] D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\sav\Bowkers-Test-of-Symmetry-data.sav

Statistics

		Before category from G1: Low, Medium, High	After category from G3: Low, Medium, High
N	Valid	649	649
	Missing	0	0

Paired Category Frequencies
Before and after grade-band distributions

Frequency Table

Before category from G1: Low, Medium, High

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (0-9)	157	24.2	24.2	24.2
	Medium (10-13)	340	52.4	52.4	76.6
	High (14+)	152	23.4	23.4	100.0
	Total	649	100.0	100.0	

After category from G3: Low, Medium, High

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low (0-9)	100	15.4	15.4	15.4
	Medium (10-13)	355	54.7	54.7	70.1
	High (14+)	194	29.9	29.9	100.0
	Total	649	100.0	100.0	

Paired Square Contingency Table

Paired Square Contingency Table
G1 grade band by G3 grade band

Crosstabs

Notes

Output Created		12-JUL-2026 20:07:45
Comments		
Input	Data	D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=bowker_before BY bowker_after /FORMAT=AVALUE TABLES /CELLS=COUNT ROW COLUMN TOTAL /COUNT ROUND CELL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02
	Dimensions Requested	2
	Cells Available	524245

Paired Square Contingency Table
G1 grade band by G3 grade band

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High	649	100.0%	0	0.0%	649	100.0%

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

			After category from G3: Low, ...	
			Low (0-9)	Medium (10-13)
Before category from G1: Low, Medium, High	Low (0-9)	Count	88	69
		% within Before category from G1: Low, Medium, High	56.1%	43.9%
		% within After category from G3: Low, Medium, High	88.0%	19.4%
		% of Total	13.6%	10.6%
	Medium (10-13)	Count	12	267
		% within Before category from G1: Low, Medium, High	3.5%	78.5%
		% within After category from G3: Low, Medium, High	12.0%	75.2%
		% of Total	1.8%	41.1%
	High (14+)	Count	0	19
		% within Before category from G1: Low, Medium, High	0.0%	12.5%

Paired Square Contingency Table
G1 grade band by G3 grade band

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

			After category ...	
			High (14+)	Total
Before category from G1: Low, Medium, High	Low (0-9)	Count	0	157
		% within Before category from G1: Low, Medium, High	0.0%	100.0%
		% within After category from G3: Low, Medium, High	0.0%	24.2%
		% of Total	0.0%	24.2%
	Medium (10-13)	Count	61	340
		% within Before category from G1: Low, Medium, High	17.9%	100.0%
		% within After category from G3: Low, Medium, High	31.4%	52.4%
		% of Total	9.4%	52.4%
	High (14+)	Count	133	152
		% within Before category from G1: Low, Medium, High	87.5%	100.0%

Paired Square Contingency Table
G1 grade band by G3 grade band

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

		After category from G3: Low, ...	
		Low (0-9)	Medium (10-13)
Total	% within After category from G3: Low, Medium, High	0.0%	5.4%
	% of Total	0.0%	2.9%
	Count	100	355
	% within Before category from G1: Low, Medium, High	15.4%	54.7%
	% within After category from G3: Low, Medium, High	100.0%	100.0%
	% of Total	15.4%	54.7%

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

		After category ...	
		High (14+)	Total
Total	% within After category from G3: Low, Medium, High	68.6%	23.4%
	% of Total	20.5%	23.4%
	Count	194	649
	% within Before category from G1: Low, Medium, High	29.9%	100.0%
	% within After category from G3: Low, Medium, High	100.0%	100.0%
	% of Total	29.9%	100.0%

Paired Category Visualization

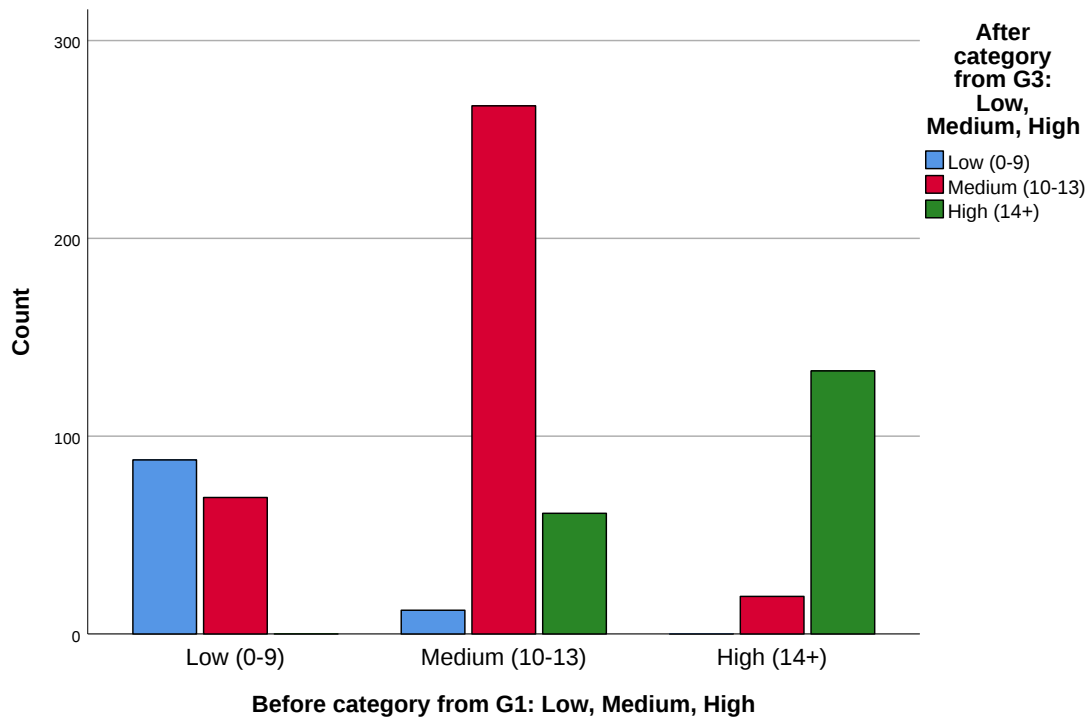
Paired Category Visualization
Clustered counts for before and after categories

Graph

Notes

Output Created		12-JUL-2026 20:07:46
Comments		
Input	Data	D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		GRAPH /BAR(GROUPED) =COUNT BY bowker_before BY bowker_after.
Resources	Processor Time	00:00:06.50
	Elapsed Time	00:00:04.51

Paired Category Visualization
Clustered counts for before and after categories



```
File "<string>", line 76
    ""
    ^
```

SyntaxError: invalid syntax

Dataset Activate

Notes

Output Created		12-JUL-2026 20:07:52
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Syntax		DATASET ACTIVATE BowkerTestResults.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Paired Category Visualization
Clustered counts for before and after categories

Warnings

Unknown dataset BowkerTestResults.

Execution of this command stops.

Bowker Test Result

Bowker Test Result
Primary symmetry test

Report

Notes

Output Created		12-JUL-2026 20:07:53
Comments		
Input	Data	D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		REPORT FORMAT=LIST AUTOMATIC ALIGN (CENTER) /VARIABLES=bowker_chi_square bowker_df bowker_p_value alpha decision_code n_complete_pairs number_categories diagonal_agreement_count off_diagonal_count agreement_rate asymmetry_index /TITLE 'Bowker Test of Symmetry Summary'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

```
>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).
>Execution of this command stops.
```

```
>Error # 14865. Command name: REPORT
```

Bowker Test Result
Primary symmetry test

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

Bowker Test Result
Primary symmetry test

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

Dataset Activate

Notes

Output Created		12-JUL-2026 20:07:53
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		DATASET ACTIVATE BowkerPairResults.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.00

Warnings

Unknown dataset BowkerPairResults.

Execution of this command stops.

Bowker Pair Contributions

Bowker Pair Contributions Reverse off-diagonal cell comparisons

```
>Error # 701 in column 15.  Text: bowker_contribution
>An undefined variable name, or a scratch or system variable was specified in
a
>variable list which accepts only standard variables.  Check spelling and
>verify the existence of this variable.
>Execution of this command stops.
```

Report

Notes

Output Created		12-JUL-2026 20:07:54
Comments		
Input	Data	D:\DATA ANALYSIS\Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		REPORT FORMAT=LIST AUTOMATIC ALIGN (CENTER) /VARIABLES=pair_code category_i category_j i_to_j j_to_i discordant_pair_total directional_difference bowker_contribution pairwise_exact_p /TITLE 'Category-Pair Contributions to Bowker Chi-Square'.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

```
>Error # 14865.  Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
```

Bowker Pair Contributions
Reverse off-diagonal cell comparisons

>DUMMY option to the subcommand).
>Execution of this command stops.

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).

>Error # 14865. Command name: REPORT

Bowker Pair Contributions

Reverse off-diagonal cell comparisons

>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics variable, a REPORT STRING variable, or a dummy variable (as designated by the >DUMMY option to the subcommand).

GGraph

Notes

Output Created		12-JUL-2026 20:07:54
Comments		
Input	Data	D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		GGRAPH /GRAPHDATASET NAME="graphdataset" VARIABLES=pair_code bowker_contribution /GRAPHSPEC SOURCE=INLINE.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Warnings

The specified variable pair_code does not exist.

Execution of this command stops.

>Error # 99. Command name: BEGIN GPL
>This command is only valid immediately following the GGRAPH procedure.
>Execution of this command stops.

Dataset Activate

Bowker Pair Contributions
Reverse off-diagonal cell comparisons

Notes

Output Created		12-JUL-2026 20:07:54
Comments		
Input	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		DATASET ACTIVATE BowkerCellResults.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Warnings

Unknown dataset BowkerCellResults.

Execution of this command stops.

Bowker Cell Counts

Bowker Cell Counts
Long-form square contingency table

Report

Notes

Output Created		12-JUL-2026 20:07:54
Comments		
Input	Data	D:\DATA ANALYSIS\ Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
Syntax		REPORT FORMAT=LIST AUTOMATIC ALIGN (CENTER) /VARIABLES=before_category after_category cell_count /TITLE 'Before-by-After Cell Counts'.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.00

```
>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).
>Execution of this command stops.
```

```
>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
>variable, a REPORT STRING variable, or a dummy variable (as designated by the
>DUMMY option to the subcommand).
```

```
>Error # 14865. Command name: REPORT
>A variable on the REPORT VARIABLES subcommand was neither a SPSS Statistics
```

Bowker Cell Counts
Long-form square contingency table

>variable, a REPORT STRING variable, or a dummy variable (as designated by the >DUMMY option to the subcommand).

Bowker Analysis Data Summary

Bowker Analysis Data Summary
Prepared paired categories

Descriptives

Notes

Output Created		12-JUL-2026 20:07:55
Comments		
Input	Data	D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=G1 G3 /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G1	649	0	19	11.40	2.745
G3	649	0	19	11.91	3.231
Valid N (listwise)	649				

Crosstabs

Bowker Analysis Data Summary
Prepared paired categories

Notes

Output Created		12-JUL-2026 20:07:55
Comments		
Input	Data	D:\DATA ANALYSIS\I Chi Square and Categorical Data Tests\Bowkers Test of Symmetry\SPSS_Output\save\Bowkers-Test-of-Symmetry-data.sav
	Active Dataset	BowkerData
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
Syntax		CROSSTABS /TABLES=bowker_before BY bowker_after /FORMAT=AVALUE TABLES /CELLS=COUNT ROW COLUMN TOTAL.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.03
	Dimensions Requested	2
	Cells Available	524245

Bowker Analysis Data Summary
Prepared paired categories

Case Processing Summary

	Valid		Cases Missing		Total	
	N	Percent	N	Percent	N	Percent
Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High	649	100.0%	0	0.0%	649	100.0%

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

			After category from G3: Low, ...	
			Low (0-9)	Medium (10-13)
Before category from G1: Low, Medium, High	Low (0-9)	Count	88	69
		% within Before category from G1: Low, Medium, High	56.1%	43.9%
		% within After category from G3: Low, Medium, High	88.0%	19.4%
		% of Total	13.6%	10.6%
	Medium (10-13)	Count	12	267
		% within Before category from G1: Low, Medium, High	3.5%	78.5%
		% within After category from G3: Low, Medium, High	12.0%	75.2%
		% of Total	1.8%	41.1%
	High (14+)	Count	0	19
		% within Before category from G1: Low, Medium, High	0.0%	12.5%

Bowker Analysis Data Summary
Prepared paired categories

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

			After category ...	
			High (14+)	Total
Before category from G1: Low, Medium, High	Low (0-9)	Count	0	157
		% within Before category from G1: Low, Medium, High	0.0%	100.0%
		% within After category from G3: Low, Medium, High	0.0%	24.2%
		% of Total	0.0%	24.2%
	Medium (10-13)	Count	61	340
		% within Before category from G1: Low, Medium, High	17.9%	100.0%
		% within After category from G3: Low, Medium, High	31.4%	52.4%
		% of Total	9.4%	52.4%
	High (14+)	Count	133	152
		% within Before category from G1: Low, Medium, High	87.5%	100.0%

Bowker Analysis Data Summary
Prepared paired categories

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

		After category from G3: Low, ...	
		Low (0-9)	Medium (10-13)
Total	% within After category from G3: Low, Medium, High	0.0%	5.4%
	% of Total	0.0%	2.9%
	Count	100	355
	% within Before category from G1: Low, Medium, High	15.4%	54.7%
	% within After category from G3: Low, Medium, High	100.0%	100.0%
	% of Total	15.4%	54.7%

Before category from G1: Low, Medium, High * After category from G3: Low, Medium, High Crosstabulation

		After category ...	
		High (14+)	Total
Total	% within After category from G3: Low, Medium, High	68.6%	23.4%
	% of Total	20.5%	23.4%
	Count	194	649
	% within Before category from G1: Low, Medium, High	29.9%	100.0%
	% within After category from G3: Low, Medium, High	100.0%	100.0%
	% of Total	29.9%	100.0%